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Foreword

IDEA Journal of Applied Research, December 2025 Edition

It is with great honour that we introduce the December 2025 edition of The IDEA Journal of Applied Research. The body of work presented in this publication reflects the continuing maturation of IDEA College as a hub of inquiry, where research is rooted in practical benefit and addresses real challenges faced by society, organisations, and individuals. This edition brings together studies that explore healthcare practice and professional development, the integration of technology in care settings, quality and inclusion in educational and social environments, community health and safety, and organisational behaviour in contexts that demand rapid and informed decision-making. Each contribution enriches ongoing discourse and offers valuable insights that advance evidence-based practice.

A central theme reflected in this edition concerns the wellbeing, motivation, and effectiveness of the healthcare and social care workforce. In Organisational Culture Effects on Job Satisfaction among Different Generations in a Healthcare Setting by **Claudine Balzan**, we see how generational differences shape expectations and job satisfaction among healthcare workers in Malta, reinforcing the need for organisational cultures that align employee values with institutional goals. This focus on human dynamics continues in Assessing the Engagement Levels of Electrocardiography Technicians Working in Mater Dei Hospital by **James Azzopardi** and **Dr Flavia Morone**, which demonstrates how increased support, professional development, and recognition can enhance work engagement in specialised healthcare roles. Meanwhile, Emotional Intelligence in Effective Leadership within the Maltese Social Sector: A Qualitative Study by **Shelley Galea Spiteri** and **Dr Damian Spiteri** underscores how emotionally intelligent leadership practices, rooted in self-awareness and reflective engagement, create psychologically safe environments that strengthen organisational resilience. Together, these studies advance a persuasive argument that high-performing care environments are fundamentally dependent on workplaces that value growth, empowerment, and emotionally intelligent practice, and that quality and social impact are deeply connected to how organisations value and support their people.

The adoption of technology and strengthening of safety systems in healthcare emerges as another defining strand of inquiry. In The Acceptance of Robotic Systems for Nursing Care at St. Vincent de Paul: A Quantitative Study by **Anne Marie Fava**, **Kurt Grixti**, and **Dr Karl Spiteri**, the authors illustrate both the perceived benefits and concerns among nurses as robotics becomes an increasingly significant feature of long-term care. A complementary focus on risk mitigation and service improvement is seen in Challenging the Obstacles in Pre-analytical Settings: Exploring Frequency, Types, and Sources of Preanalytical Errors in Blood Sampling Practice by **Graziella Santillo** and **Dr Emanuel Camilleri**, which argues for stronger training and system design to prevent avoidable laboratory errors. Patient safety and continuity of care remain central in Validating HOSPITAL Score for 30-Day Readmission and Mortality in Older Adults Discharged to Long-Term Care by **Dr Sephora Santucci, Emanuel Schembri, Dr Karl Spiteri,** and **Dr Tracy Lee Vidal**, which confirms the predictive value of an established clinical tool in the Maltese setting. Complementing these is a cross-cultural validation of an empowerment tool designed to support older individuals in mitigating fall risks. The Empowerment of Elderly Individuals Regarding the Risk of Falls (TEEI-FALLS) Tool: Translation to English and Maltese and Cross-Cultural Validation by **Dr Flavia Cristina Morone Pinto et.al**. demonstrates how culturally adapted assessment instruments can foster autonomy and better health outcomes for older adults. Collectively, these works highlight the increasing role of technology, system design, and patient empowerment in shaping a safer and more sustainable healthcare landscape. They also indicate how innovation that is both ethically sensitive and practically grounded can significantly elevate safety, sustainability, and person-centred care.

Issues of inclusion and equity surface prominently in research addressing the educational and social needs of diverse learners. In Student Support Services in a UK Further–Higher Education College: Institutional Perspectives by **Dr Rosetta Thornhill** and **Dr Damian Spiteri**, the authors show how student voice and coordinated services are essential for fostering academic success, even within resource-constrained environments. Their second contribution, Learners' Perspectives of Inclusive Practices of a Public Higher Vocational Education Provider in Malta, exposes the persistence of structural barriers in vocational education and the desire among students for a more participatory and responsive learning culture. In a parallel area of social inclusion, Transgender Adults' Perceptions of Residential Long-Term Care in Malta: Implications for Inclusive Practice by **Natasha Gilson** and **Dr Damian Spiteri** documents the fears and aspirations of transgender adults regarding residential care, making a compelling case for dignity-affirming policies and staff training. The arguments developed across these studies converge in a powerful call to redesign services and systems so that all individuals feel valued, respected, and able to thrive. Indeed, these studies show that communities flourish when their institutions actively dismantle barriers and create structures that respect and value human diversity.

Attention to public safety and informed citizenship is also evident in Recreational Bathing Water in Malta: A Cross-Sectional Survey of Awareness, Information Use, and Perceived Risks by **Denise Chetcuti** and **Dr Emanuel Camilleri,** where the authors highlight knowledge gaps relating to water quality monitoring and the importance of accessible health communication and infrastructure in shared community spaces. Broadening the conversation into organisational decision-making in high-pressure contexts, When Time Is Tight: Decision-Making in the Armed Forces of Malta by **Kieran Laws** and **Dr Damian Spiteri** demonstrates how leadership style and efficient communication shape the cognitive performance of personnel under operational stress. This offers timely insight into how small national forces can prepare for complex, rapid-response scenarios.

This edition concludes with the proceedings of a symposium held by IDEA College, where research students and emerging scholars shared the outcomes of their current studies. These proceedings symbolise not only the dissemination of knowledge but also the strengthening of a vibrant research culture that continues to expand in scale, ambition, and societal relevance.

Taken together, the works published here advance a clear narrative: applied research is a crucial lever for progress when it responds directly to community needs, improves professional practice, and actively contributes to shaping a more inclusive, safer, and sustainable society. The diversity of approaches found in this edition, quantitative, qualitative, mixed methods, and validation studies, demonstrates a growing methodological sophistication and a collective prioritisation of generating actionable knowledge.

We extend our sincere gratitude to all authors, reviewers, and the editorial team for their dedication and scholarly excellence. We look forward to continued growth in research leadership from IDEA College and the expanded influence that our academic community will continue to achieve both nationally and internationally.

Dr Nadia Maria Vassallo

Editor-in-Chief
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01 Organisational Culture Effects on Job Satisfaction among Different Generations in a Healthcare Setting

Claudine Balzan

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Abstract

The healthcare sector thrives on offering resilient health systems that help provide cost-effective services. However, these factors impact both internal and external aspects. Moreover, the healthcare workforce comprises various healthcare professions and generations, all of whom view work differently. Thus, balancing organisational goals with the employees' expectations of the different workforce generations is challenging. Nonetheless, employees become more engaged when their needs and values are aligned with the organisation's vision.

Therefore, understanding each generation's key motivational drivers is paramount in fostering loyalty, engagement, and job satisfaction. Embracing such diversity helps organisations build an effective organisational culture, which leads to high-quality service and long-term organisational success.

This empirical research study, based on a deductive quantitative approach, was conducted among employees of the Maltese National Blood Transfusion Service (NBTS). An anonymous questionnaire was manually distributed to the seventy-two NBTS employees. Sixty-two employees participated in the study, reaching a 95% confidence level.

New perspectives on how NBTS's diverse workforce is influenced by organisational culture were gained. The study highlighted employee job satisfaction levels and areas needing improvement. Results showed that employee aspirations differ among generations. It also demonstrated that healthcare workers seek growth opportunities and look for supportive, honest, transparent work environments while expecting their contributions to be valued and appreciated.

Keywords: "Organisational Culture", "Employee Well-Being", "Motivation", "Performance", "Job Satisfaction"

Generation X	Generation Y	Generation Z
• Transparent Communication • Career Progression	• Transparent Communication • Career Progression	• Transparent Communication • Career Progression
• Equal Recognition • Traditional compensation • Healthy Coworker Relationships	• Recognition • Meaningful Work • Rewards for performed tasks • Fairness • Team Cohesion	• Recognition • Celebrate Achievements • Healthy Coworker Relationships • Mutual Trust, Respect & Inclusion

Graphical Abstract: Generation Expectations that Foster Well-Being and Job Satisfaction

Highlights:

- Employees value supportive, transparent and honest work environments that align with their personal values.
- Job satisfaction is influenced by factors such as career progression, recognition, coworker relationships, and communication.
- Generation X prioritise job stability, autonomy and financial security.
- Generation Y seek meaningful work, fairness and rewards.
- Generation Z values recognition, celebrate achievements and career growth.
- Females emphasise career progression, fairness and supportive environments.
- Males prioritise intrinsic motivation, personal job satisfaction and clear communication.
- Non-binary employees value work clarity, transparent communication and recognition.

Abbreviations:

CO	Contribution to the Organisation
DPO	Data Protection Officer
EWWQ	Eudemonic Well-being at the Workplace Questionnaire
FD	Fit and Development
JSS	Job Satisfaction Survey
NBTS	National Blood Transfusion Service
PO	Positive Organisation
PRC	Positive Relationships with Coworkers
SDT	Self-Determination Theory
SPSS	Statistical Package for Social Sciences

Symbols

μ	Mean
%	Percentage
SD	Standard Deviation
r_s	Spearman's rank-order correlation coefficient

Introduction

The healthcare sector faces unique challenges in aligning organisational goals with employee aspirations and well-being, which impacts career attraction and retention. Balancing these needs is crucial to avoid staff dissatisfaction and lack of long-term commitment (Dartey-Baah & Harlley, 2010). Furthermore, employee performance and motivation are critical for delivering high-quality service, especially in specialised units like blood establishments. Everyone is unique and belongs to various subcultures where distinctive beliefs, norms, practices and values differentiate one culture from another (Galanti, 2019).

The workforce comprises individuals from diverse generations, such as NBTS employees, with various interests and behaviours (Heyns & Kerr, 2018), which poses challenging management, as work values have shifted across generations (Twenge et al., 2010). Hence, exploring the differences and similarities is necessary, as understanding these factors enables management to identify ways to make the workplace more appealing. Ely and Thomas (2001) assert that meaningful outcomes can be achieved when organisations integrate inclusive strategies into their core.

Understanding motivational drivers across generations is key in influencing individual and organisational performance (Heyns & Kerr, 2018). Happy employees are more productive and engaged (Diener, 2000; Judge et al., 2001; Aziri, 2011). Engaged employees display energy, resilience and effective connections to their tasks, contributing to enhanced productivity and organisational culture (Valamis, 2023). Eudaimonia and intrinsic motivation promote alignment with personal values, fostering empowerment and positive emotions (Waterman, Schwartz, & Conti, 2008).

Schein's Iceberg Model (Figure 1) illustrates the visible and invisible elements of culture's complexity by splitting it into three layers. Schein's model demonstrates the importance of culture in an organisation, as it can either unite or divide individuals, allowing tasks to be done more effectively and efficiently in a communal culture (Sokro, 2012).

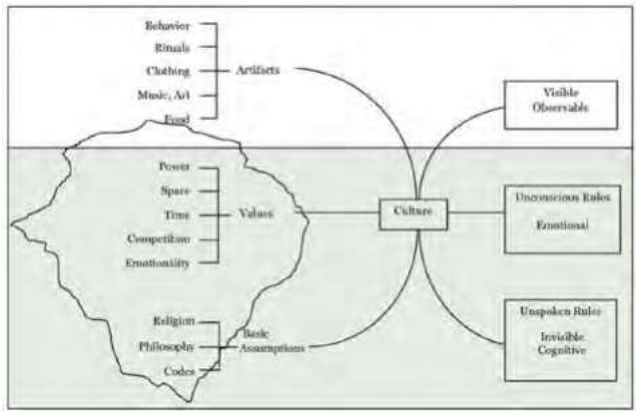

Figure 1 - The Iceberg Model based on various sources (Dissabandara, 2014).

Thus, new management and leadership standards must be recognised, as the top-down approach may not be as effective with the younger generation (Gursoy, Maier & Chi, 2008). Therefore, a shared organisational vision and effective leadership based on trust and collaboration are essential for managing diverse perspectives and in achieving organisational goals (Suter et al., 2010; Schein & Schein, 2018).

The impact of organisational culture on job satisfaction is studied among the diverse generations in the healthcare sector (at the NBTS). This research identified four generations at the NBTS, each with varying aspirations and expectations in the workplace. Therefore, understanding motivational drivers among each generation is crucial in creating a supportive environment, as it helps in fostering loyalty and job satisfaction. This study also emphasised the need for inclusivity and employee recognition in the diverse workplace sub-cultures.

Furthermore, this study aimed to investigate whether demographic factors, such as age and gender, impact job satisfaction domains. Understanding these differences can help organisations tailor their management practices, policies and work environments to enhance job satisfaction for a diverse workforce. Knowing what employees from different generations aspire to is essential (Jurkiewicz, 2000). Therefore, managers can assist in creating a win-win situation for employees and employers by fostering a work environment that is favourable to achieving their organisational goals (Vyas & Shrivastava, 2017).

Thus, the objectives of this study were:

- To analyse the effects of organisational culture on employee job satisfaction.
- To analyse if different generations present in the workforce are affected differently by organisational culture.
- To examine the relationship between organisational culture and job satisfaction.

These have led to the following research guiding questions:

Q1. What are the effects of organisational culture on employee job satisfaction?
Q2. What are the effects of organisational culture on employee job satisfaction among different workforce generations?
Q3. How do organisational culture and job satisfaction affect each other?

Despite its limitations, this study provided real-life data, helping to understand the motivational drivers of employees across different generations (Wong et al., 2008) and genders. Understanding the organisation's uniqueness and cultural capabilities is essential when making strategic decisions (Waterman, 1982). Job satisfaction can be determined to influence organisational performance (Bakotić, 2016), as it is positively linked, though moderated by various factors (Judge et al., 2001). Consequently, it is vital to study and understand motivational drivers, as what might motivate one person does not necessarily motivate the other in the same way (Czerw, 2019).

Methodology

The philosophy, paradigm and reasoning shape the research process. Based on existing knowledge, deductive reasoning was chosen to enhance the robustness and reliability of the study. A quantitative survey research approach was employed because it objectively measures reality (Williams, 2007). An anonymous questionnaire was manually distributed to encourage participation and thus enhance its validity (Thompson & Panacek, 2007). In fact, 62 out of the 72 NBTS employees agreed to participate in this study, achieving a 95% confidence level.

2.1 The survey questionnaire

The survey was divided into three parts. Two pre-validated questionnaires, the Eudemonic Well-being at the Workplace Questionnaire (EWWQ) by Czerw (2019) and Job Satisfaction Survey (JSS) by Spector (1985), for which the authors' approval was obtained, provided that the content and scores would not be altered, along with demographic data, were used. The EWWQ included 43 statements about employee well-being at the workplace, using a 7-point Likert scale, from 1(strongly disagree) to 7 (strongly agree). The JSS included 36 statements about job satisfaction, using a 6-Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). The demographic data included gender, generation cohort, years of working at NBTS, area of work, how they currently feel about working at NBTS, and their perception of the organisation's leadership. They were asked to circle the emoji that best suited their feelings. Demographic data was placed at the end of the survey to prevent respondents from becoming disinterested in the survey (Jackson, 2015).

2.2 Sampling

Data saturation is the most frequently cited justification for sample size in qualitative research, as it enables the collection of sufficient data to draw the necessary conclusions (Braun & Clarke, 2019). Thus, for this study, the researcher invited all employees to participate. Therefore, the results obtained can be generalised to the whole NBTS population.

Considering the total NBTS population of 72 individuals (the target population), this meant that 61 or more surveys were needed to have a 95% confidence level that the real value is within ±5% of the measured/surveyed value (Study.com, 2025). In all, 62 questionnaires were collected.

2.3 Data Analysis

The gathered data was analysed for correlations among gender and workforce generations to test the generated hypothesis based on three arguments:

Argument 1: An organisational culture may accentuate a positive organisational environment (PO), support fit and professional development (FD), cherish positive relationships among co-workers (PRC) and value individual contributions to the organisation (CO), which varies across generations and genders.

For this, each statement of the EWWQ was categorised under four dimensions: PO, FD, PRC and CO. Every dimension's high and low scores were categorised into positive, neutral, and negative scale indicators.

Argument 2: Job satisfaction is a critical factor influencing employee motivation, retention and overall workplace well-being. The nine subcategories (pay, promotion opportunities, supervision, fringe benefits, contingent rewards, operating conditions, coworker relationships, nature of work, and communication) of Spector (1985) JSS provide a multidimensional approach to understand employee satisfaction. However, job satisfaction is not uniform across all employees due to generational expectations and gender related work experiences.

Statements of the JSS were organised under the previously mentioned nine subcategories with four items for each category, as instructed by the author. A reversed score was applied to a negatively worded statements, and then the total scores were calculated. For missing items, mean scores were computed per item for the individual and substituted for the mean.

Argument 3: Organisational culture shapes employee experiences, influencing their eudemonic well-being and overall job satisfaction. A positive organisational culture that fosters growth, collaboration, recognition, and inclusivity can enhance employees' sense of meaning, purpose, and fulfilment at work. However, as individuals may have diverse workplace expectations and values, the extent of the impact may vary across different genders and generations.

Correlation analysis was conducted between the EWWQ subscale dimensions and the JSS subcategories. The researcher followed the interpretation of the correlation coefficient, as shown in Table 1.

Correlation coefficient	Conventional interpretation
1.0≤|r|>0.8	very strong positive correlation
0.6≤|r|<0.8	strong positive correlation
0.4≤|r|<0.6	moderate positive correlation
0.2≤|r|<0.4	weak positive correlation
0.0≤|r|<0.2	very weak positive correlation
0.0	no correlation
-0.0≤|r|<-0.2	very weak negative correlation
-0.2≤|r|<-0.4	weak negative correlation
-0.4≤|r|<-0.6	moderate negative correlation
-0.6≤|r|<-0.8	strong negative correlation
-1.0≤|r|>-0.8	very strong negative correlation

Table 1 - Correlation coefficient interpretation

Excel and SPSS were used to analyse the collected data. Descriptive statistics were calculated for each survey based on generation and gender, presented by percentage (%). The mean (μ), standard deviation (SD), and median scores were calculated for each questionnaire. Demographic data were used to understand how scores vary between the dependent and independent variables. Relationships were examined by searching for correlations using Spearman's rank-order correlation coefficient analysis (rs).

Moreover, partial correlation was used for data analysis, where the correlation coefficient ranges from -1 to +1, indicating a positive value for a direct relationship. Factors closer to ± 1 indicate a stronger relationship, and those closer to 0 indicate a weaker relationship. When the relationship is statistically significant, it is marked by a p-value of <0.05, and when it is highly significant, with $p<0.01$. Tables, charts and figures were used to display the results.

2.4 Ethical Considerations

The study was conducted after obtaining the necessary approvals from the IDEA College Board of Ethics, the NBTS Director, the Responsible Person and the NBTS DPO, where the study was held. Approval was also sought and obtained from the original authors for the tools used.

Results

Thirty females, 27 Males, and 5 Non-Binary individuals were identified in this study, spanning four generations. One of them was from the Baby Boomer Generation, 36 from Generation X, 22 from Generation Y, and three from Generation Z. The NBTS is primarily divided into four sections, with the highest number of participants, 41.9%, being employees who worked at NBTS laboratories, followed by those in the donation area (40.3%), NBTS management (9.7%), and administration/offices (6.5%).

The EWWQ's overall low to very low scores indicate that all four dimensions need improvement for the NBTS staff to feel supported and engaged (Table 2).

Statistics Report

Generations			PO	FD	PRC	CO
1946-1964 Baby Boomers	N	Valid	1	1	1	1
		Missing	0	0	0	0
	Mean		**.9240**	**1.3333**	**1.1742**	**.9048**
	Median		.9240	1.3333	1.1742	.9048
	Sum		.92	1.33	1.17	.90
1965-1980 Generation X	N	Valid	36	36	36	36
		Missing	0	0	0	0
	Mean		**1.4521**	**.9809**	**.8920**	**.6032**
	Median		1.2573	.4356	.5303	.4554
	Sum		52.28	35.31	32.11	21.71
	Std. Deviation		1.31811	1.36709	.85205	.63951
1981-1996 Generation Y	N	Valid	22	22	22	22
		Missing	0	0	0	0
	Mean		**2.0635**	**1.3988**	**1.2107**	**1.0446**
	Median		1.5409	.6212	.8485	.7411
	Sum		45.40	30.77	26.64	22.98
	Std. Deviation		1.07755	1.60194	1.19615	1.16175
1997-2012 Generation Z	N	Valid	3	3	3	3
		Missing	0	0	0	0
	Mean		**1.7524**	**.9242**	**1.7121**	**.9702**
	Median		.8947	.8106	.9924	.6964
	Sum		5.26	2.77	5.14	2.91
	Std. Deviation		1.56731	.54308	1.76167	.85497

Table 2– Overview of the EWWQ dimensions by generation
Note: PO – Positive Organisation; FD – Fit and Development;
PRC – Positive relationships with Coworkers; CO – Contribution to the organisation

Moreover, all of the NBTS employees showed satisfaction with the nature of their jobs; however, they are dissatisfied with their chances of being promoted. A link was noted between the results obtained from the demographic data, which was presented after the EWWQ and JSS statements. This data showed positivity among NBTS employees regarding their general feelings about their work, especially lab workers (figure 2) and Gen Xers (figure 3).

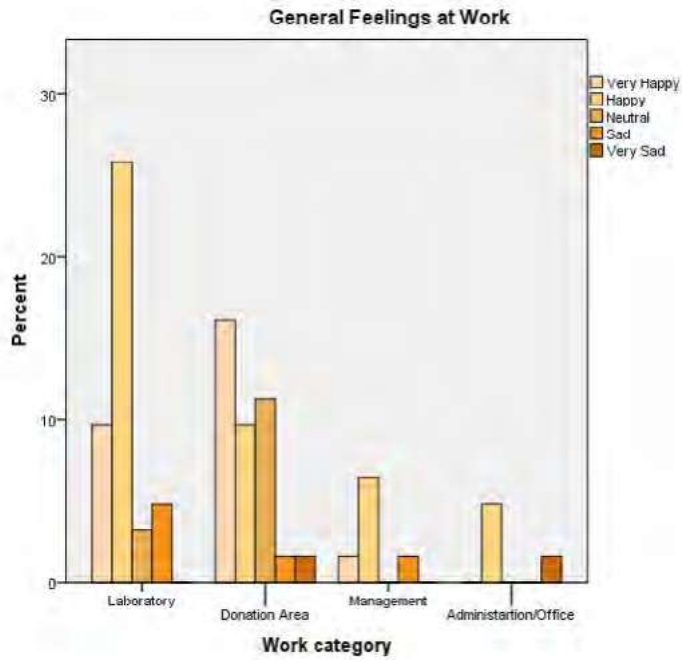

Figure 2 – General feelings at work by NBTS sectional category

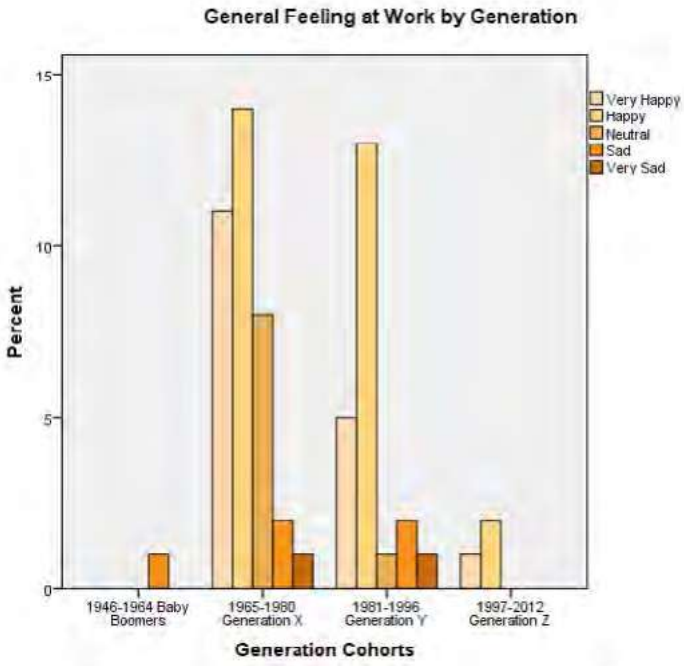

Figure 3 – Participants' general feelings at work by generation

On the contrary, although Supervision scored high in the JSS μ:17.2, there were varied answers, including very sad, when asked how they felt about their leadership, especially in Millennials (figure 4). Yet most of the employees working in the laboratory showed that they were happy with their leadership, and more varied answers were seen in the donation area (figure 5).

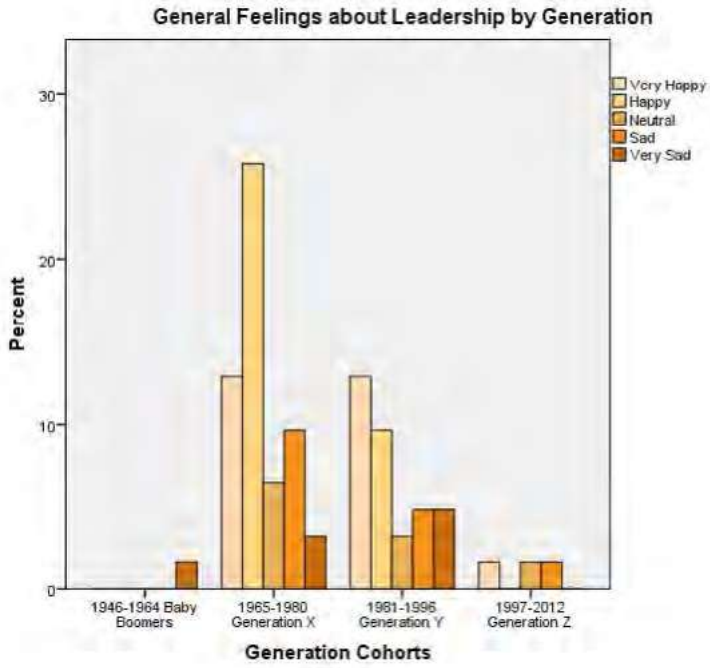

Figure 4 – General feelings about NBTS leadership by generation

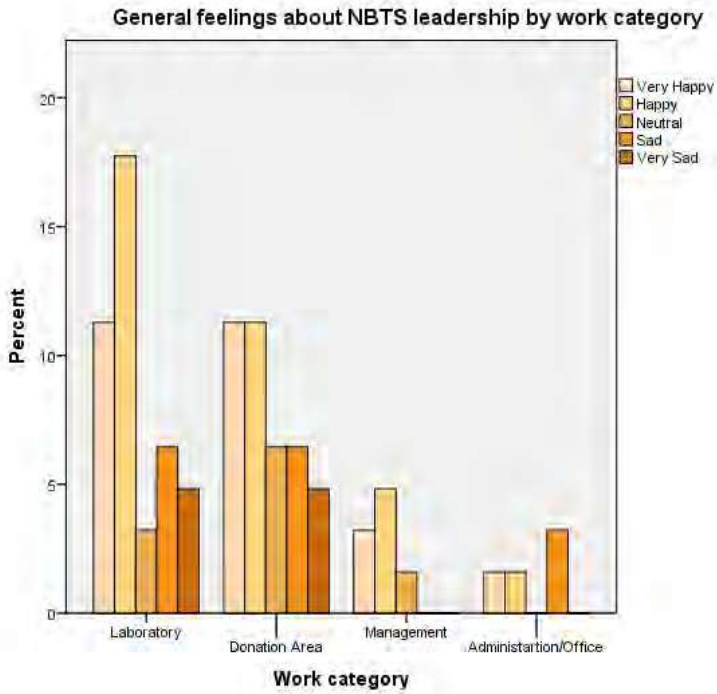

Figure 5 – General feelings about NBTS leadership by sectional category

Moreover, the correlations between EWWQ dimensions versus JSS subcategories suggest that compensation and rewards do not necessarily translate into a more positive workplace perception. Furthermore, adapting interventions to gender-specific patterns might be effective. Utilising the relationships identified in this study can help formulate strategies to enhance organisational results and employee job satisfaction.

Besides, results indicated that job stability, autonomy, and financial security are key factors for Gen X. Additionally, ensuring fair rewards to prevent competition among Gen X is also beneficial. Meaningful work, fairness, and rewards for performed tasks are crucial factors in driving collaboration among Gen Y employees. Moreover, recognition and career growth are crucial for Gen Z. However, missing significant values makes these results unclear for this generation. Transparent Communication and Career Progression are essential across generations to avoid demotivation. Based on this the following hypothesis results were concluded (table 3).

Hypothesis Tests Results		
H01	No significant relationship exists between eudemonic well-being at the workplace and workplace generations.	Rejected
HA1	A significant relationship exists between eudemonic well-being at the workplace and workplace generations.	Accepted
H02	No significant relationship exists between eudemonic well-being at the workplace and gender.	Rejected
HA2	A significant relationship exists between eudemonic well-being at the workplace and gender.	Accepted
H03	No significant difference exists between the nine factors of the job satisfaction survey across workplace generations.	Rejected
HA3	A significant difference exists between the nine factors of the job satisfaction survey across workplace generations.	Accepted
H04	No significant difference exists between the nine factors of the job satisfaction survey and gender.	Rejected
HA4	A significant difference exists between the nine factors of the job satisfaction survey and gender.	Accepted
H05	There is no significant relationship between eudemonic well-being at the workplace and job satisfaction among generations in the workforce.	Rejected
HA5	There is a significant relationship between eudemonic well-being at the workplace and job satisfaction among generations in the workforce.	Accepted
H06	There is no significant relationship between eudemonic well-being at the workplace and job satisfaction among genders.	Rejected
HA6	There is a significant relationship between eudemonic well-being at the workplace and job satisfaction among genders.	Accepted

Table 3 – Hypothesis Test Results

Discussion

Employees are an organisation's most valuable asset. Everyone is unique and brings skills, intelligence, and a personal life with various needs and desires (Barney, 1995). Thus, recognising this diversity helps the organisation get the best out of everyone without creating preferences/prejudices. Inequity influences motivation, satisfaction, and behaviour (Adams, 1963). Therefore, establishing fair treatment among all employees enhances motivation and job satisfaction (Tanner, 2020). Moreover, employees who believe they make valuable contributions to their organisation are more often proactive, productive, and willing to take on challenging tasks, thus enhancing performance (Sokro, 2012).

Studies also indicate that motivation improves when employees understand organisational direction and are rewarded for their efforts. Therefore, clear policies and management support help reduce frustration while promoting collaboration (Potgieter & Tait, 2013). Maslow's Hierarchy of Needs suggests that individual satisfaction results from fulfilling basic to advanced human needs (Aziri, 2011), where individuals ultimately seek to self-actualise and be independent in their work (Deci & Ryan, 1985). Furthermore, McClelland's Human Motivation Theory suggests that individuals are driven by dominant motivators, which shape their approach to work, leadership, and decision-making (Boyatzis, 2017). Additionally, the Self-Determination Theory (SDT) explores the connections between motivation, employee performance, and well-being. Thus, according to the SDT, creating an environment where employees feel encouraged to exercise their autonomy enhances their happiness and well-being, leading to gaining organisational efficacy (Deci, Olafsen & Ryan, 2017).

Therefore, at NBTS, it is essential to investigate the source of dissatisfaction, as this helps to implement targeted strategies to improve leadership, worker dynamics, and job satisfaction. Management should also be supported by encouraging leadership development and building exercises to shift feelings from neutral to positive ones. Furthermore, sustaining success in the laboratory requires identifying the practices leading to high satisfaction levels. Management may also consider applying these practices to other work categories. Creating autonomy-supportive work environments leads to better performance, persistence and job satisfaction (Deci & Ryan, 1985).

4.1 Effective leadership

Notably, Gen X and Gen Y had the most varied distribution of feelings about leadership, with a significant portion of Gen Xers feeling happy; however, a substantial percentage indicated that they felt sad. While Gen Y reported positive feelings about leadership, a higher portion of Gen X reported feeling very sad. Varied responses were noted among Gen Z, while baby boomers were very sad; however, due to the small number of participants in these two generations, the conclusions are limited.

Understanding leadership and its behaviour is paramount, as it impacts the entire functioning of the system (Schein, 2009). Zemke, Raines, and Filipczak (1999) accentuate the critical role of leadership in managing and leveraging a diverse, multigenerational workforce. They argue that effective leadership requires understanding each generation's unique characteristics, motivations, and communication preferences.

The five principles of Kouzes and Posner (2008) can help leaders understand how to treat employees and how to attain goals. Diverse subcultures, such as gender and generational differences, exist within organisations and, if mismanaged, can result in workplace conflicts and inefficiencies (Zemke, Raines, & Filipczak, 1999). Therefore, leaders' navigating these dynamics helps foster cohesion while respecting distinct needs (Schein, 2004). The supportive leadership theory can help leaders build trust and create an inspired vision that motivates workmates' collective actions (Garman & Johnson, 2010).

4.2 EWWQ and JSS relation by Generation

Results indicate distinct workplace values among Gen X, Gen Y, and Gen Z. For instance, Gen X prioritises traditional compensation; equal recognition from their superiors enhances coworkers' relationships. In contrast, Millennials seek career growth and meaningful tasks and anticipate rewards in return for their work. In addition, Gen Z seeks recognition and celebrating achievements. This finding correlates with other studies by Twenge et al. (2010) and Krahn & Galambos (2014), which also reported similar results.

Motivating employees in present-day business activities differs from years ago because each generation has its own preferences for the working environment and expectations for their contributions (Yusoff & Kian, 2013).

For example, literature indicates that Gen Xers seek immediate recognition through titles, promotions, and pay. Millennials seek teamwork and trust in centralised authority but lack interpersonal skills (Gursoy, Maier & Chi, 2008). However, the findings showed that Gen Y members exhibit ambivalence towards coworkers at NBTS, which may be an area of concern.

Moreover, young generations have different aspirations from previous generations. This makes it more crucial for management to attract and retain talent. Hence, creating a culture where employees feel valued while recognising and respecting diversity (Schein & Schein, 2018) helps improve performance and long-term organisational success (Ely & Thomas, 2001). Furthermore, due to increasing competitiveness and job mobility, especially among younger generations (Wiskow, Albreht, & De Pietro, 2010), talent retention is becoming increasingly challenging nowadays (Atan & Aina, 2020). To attract and retain talent, human resources must proactively plan their strategies and work on factors such as teamwork, openness and creating training and development opportunities (Hiltrop, 1999).

Diverse studies suggest that pay helps organisations retain talented employees (Challenger, Gray & Christmas, 1999, cited in Hiltrop, 1999). However, this factor alone is no longer sufficient nowadays. Having pride in one's job and trust in their chiefs/directors/managers that they can make decisions while feeling well treated enhances the chances of the organisation keeping talented employees. In addition, having good-quality relationships is an essential source of life satisfaction and well-being; thus, one's relationships at work matter, as they aid the individual in flourishing personally and enhance their sense of accomplishment (Reis & Gable, 2003). The study highlights the importance of fostering a positive organisational culture that values transparency, teamwork, and growth opportunities. Addressing generational and gender-specific needs can enhance employee satisfaction, engagement, and long-term organisational success. Tailoring motivational strategies to align with generational preferences is essential, as it improves employee satisfaction and retention (Yusoff & Kian, 2013).

Conclusions

This study provided new insights into how organisational culture affects NBTS's diverse workforce and enhances job satisfaction. Findings indicate a significant relationship between employee well-being and job satisfaction. Results showed that NBTS employees acknowledge the importance of transparent communication. It also showed that employees seek supportive, honest, transparent work environments that fit them and foster growth and development. Besides, they seek appreciation for their contributions, which seems to be lacking.

The study also revealed different expectations among the diverse generations and genders at NBTS that enhance their job satisfaction and well-being at the workplace (figure 6).

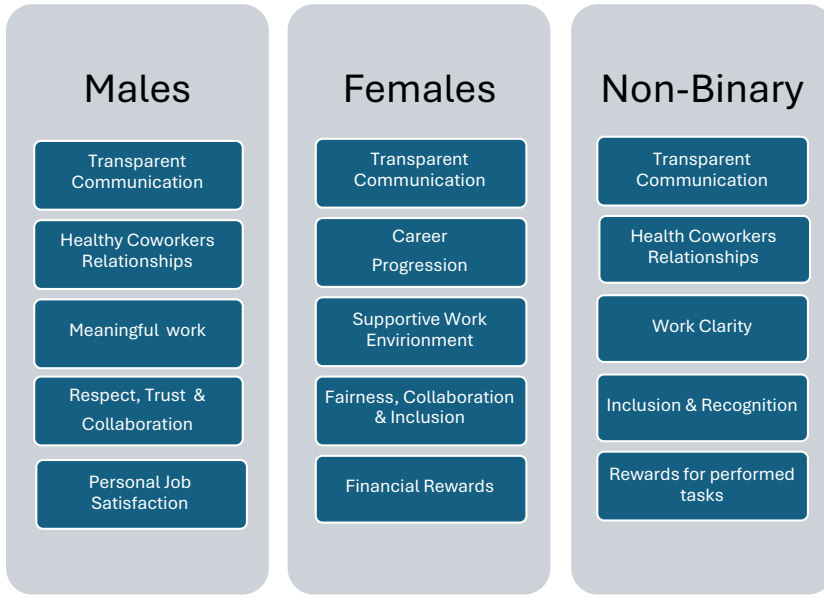

Figure 6 – Expectations that foster well-being and job satisfaction by gender

Hence, to attract and retain these generations, management must acknowledge this diversity and implement the necessary policies to attract young adults. This is of utmost importance, especially in the healthcare sector, which is ageing, especially at the NBTS, where young employees need to be attracted by being flexible to meet their needs. Navigating today's complexities with a diverse workforce makes adaptive leadership critical, as it requires including underrepresented voices by adapting to their communication and decision-making styles.

In conclusion, cultivating a culture that encourages teamwork and cohesion and fosters a conducive and trusting work environment helps establish positive relationships among coworkers. This aids NBTS employees to perceive a positive organisation, which enhances organisational fit. A more transparent and supportive environment can help build confidence, trust, loyalty, and motivation, ultimately enhancing employees' well-being and job satisfaction. Establishing these improvements in employee experiences will ultimately help NBTS achieve its organisational goals, yielding improved service quality and long-term organisational success.

Conflict of Interest

The researcher is a professional at the Maltese National Blood Transfusion Service (NBTS) under study. The researcher had no direct contact with any of the research participants, avoiding any bias.

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02 Assessing the engagement levels of Electrocardiography Technicians working in Mater Dei Hospital

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Abstract

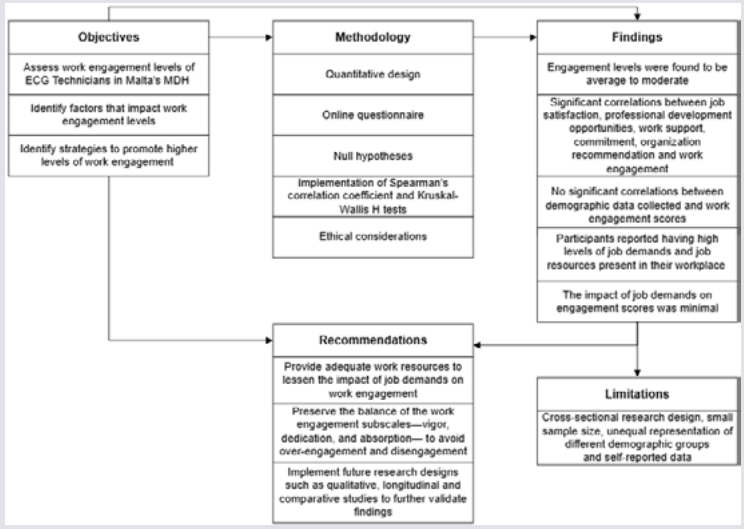
Objectives: The objective of this study was to measure work engagement levels among Electrocardiography (ECG) technicians at Mater Dei Hospital (MDH) in Malta, focusing on the impact of demographics, job demands and resources, and other variables on work engagement.

Methodology: A quantitative study approach (with an online questionnaire) was selected for its capacity to yield measurable and generalisable insights into participants' work engagement levels of participants, whereas a descriptive correlational research design allowed the researcher to describe and investigate correlations between work engagement and various demographic variables. By employing the Utrecht Work Engagement Scale (UWES) 17 to measure engagement levels and statistical methods such as the Spearman's correlation coefficient and the Kruskal-Wallis H tests, important factors influencing work engagement were identified.

Findings: The study's findings show that the engagement levels of participants were average to moderate. Significant correlations linking job satisfaction, professional development opportunities, work support, commitment and organization recommendation with work engagement were identified. Demographic variables such as education, gender, age, and years of experience had minimal impact on work engagement levels. Participants indicated the presence of high job demands and resources within their work organisation.

Conclusion: Recommendations focus on targeted strategies to increase work engagement by providing work resources to lessen the impact on job demands and implementing future research designs such as longitudinal and comparative studies to further validate these findings. The limitations identified included the cross-sectional design, the small sample size and self-reported data.

Keywords: "Work engagement", "UWES-17", "job demands", "job resources", "healthcare"



Graphical abstract: Assessing work engagement in ECG Technicians: A Quantitative Study at Mater Dei Hospital

Highlights:
- Participants reported an average level of work engagement.
- Both job resources and job demands were highly present in the workplace.
- Different demographic data did not significantly correlate with work engagement scores.
- Job satisfaction and professional development opportunities positively and significantly correlated with higher engagement scores.
- Job resources can mitigate the effect of job demands on work engagement thus showing the importance of providing adequate work resources for all employees.

Abbreviations:
ECG: Electrocardiography
HR: Human resources
JD-R: Job demands and resources
KMO: Kaiser–Meyer–Olkin
MDH: Mater Dei Hospital
UWES: Utrecht Work Engagement Scale

Introduction

Employing and retaining engaged employees is essential in today's healthcare system for several reasons – the world's ageing population and the rise in chronic illnesses - which have increased demand for healthcare services and personnel (Szilvassy and Širok, 2022). These factors increase strain on healthcare professionals and systems, leading to issues associated with employee recruitment and retention, excessive turnover, maintaining and improving service quality and staff burnout. A critical component that can help with these challenges is work engagement (Szilvassy and Širok, 2022; Williams et al., 2020).

William Kahn created the term "engagement" in 1990. He described it as the process by which individuals embrace their own identities to fulfil their job responsibilities; in this process, they use their own physical, cognitive and emotional attributes to express and fulfil their work duties. Work engagement is also commonly described as a positive and gratifying work-related mental state characterized by vigor, dedication, and absorption. Vigor is the capacity to put in a significant amount of effort at work due to strong levels of energy. Individuals who are dedicated to their profession are motivated, have enthusiasm and a sense of purpose. Absorption is the condition of being completely focused and absorbed in one's job (Bakker, 2017).

Disengagement is the term used to describe a person's lack of enthusiasm, interest, or dedication to their profession or employment. Disengaged staff are less likely to be involved and devoted to their work and may even decide to quit their job (Allam, 2017). Kahn (1990) also described disengagement as detaching oneself from one's work responsibilities and as withdrawing and shielding oneself physically, mentally, or emotionally while carrying out work duties.

1.1 Theoretical frameworks on employee engagement.

The Job demands and resources (JD-R) model
According to Bakker and Demerouti (2007), the JD-R model presupposes that two major categories can be utilised to classify all job attributes: job demands and job resources. This model also implies that when employees receive job-related resources, they are more likely to be engaged in their workplace (Sun and Bunchapattanasakda, 2019; Nawaz et al., 2014). On the other hand, job demands, which include work pressure, heavy workloads, and high emotional and physical demands, can harm an employee's health by depleting their physical and mental resources and increase the risk of burnout, health issues, and turnover intentions (Demerouti et al., 2001).

The needs-satisfaction framework
Kahn's (1990) description of engagement is the first to use the needs-satisfaction framework. He argued that personnel are more likely to be engaged at work when three psychological requirements are met: availability (having the cognitive, emotional, and physical resources required for investing oneself in role performances), safety (being able to show and employ oneself without fear of negative consequences to one's self-image or career), and meaningfulness (the perception of return on investments of oneself in role performance).

The social exchange theory
The social exchange theory bases itself on reciprocal values; the concept is that personnel who perceive that their employer treats them well would be more inclined to respond by putting in extra effort at work in the form of engagement (Saks, 2006). Employees who benefit financially, emotionally and socially from their employers and organisations feel compelled to give back in like by acting with positive attitudes and commitment (Cropanzano and Mitchell, 2005).

1.2 Benefits of work engagement

From the standpoint of the organisation, high work engagement results in improved client retention, self-efficacy, harmony, and resistance against external pressures. From an individual point of view, it increases work performance, demand-driven effort, employee health and well-being, and fulfilment of expectations (Gupta and Sharma, 2016 cited in Kartal, 2018, p.2). Engaged employees typically perform better than those who are not, and existing evidence supports the idea that work engagement guards against unfavourable consequences that include burnout, absenteeism and turnover (Hakanen et al., 2008). Furthermore, engaged employees commit less mistakes, are less likely to be involved in accidents or injuries at work, exhibit more creative work practices, and receive higher ratings from supervisors for their efficacy and job performance (Schaufeli, 2012).

1.3 Measuring employee engagement

The UWES, which consists of three subscales—vigor, dedication, and absorption—is one of the most employed instruments for assessing employee engagement. Schaufeli et al., (2002) stated that the subscales' combined scores can be utilised as a general indicator of employee engagement at work. The UWES-17, a questionnaire composed of seventeen items that gauge the three aspects of work engagement: vigor (six items), dedication (five items), and absorption (six items), was established by Schaufeli and Bakker in 2004.

1.4 The research problem

Employee engagement levels in Malta have shifted in recent years. The latest Gallup (2024) research revealed that 65.3% of Malta's workforce is not engaged and 21.8% of workers are actively engaged in their work, compared to 12.9% who find themselves actively disengaged. There is a general research gap on employee engagement literature within the Maltese health sector, and this project will be the first to assess the engagement levels of ECG Technicians working in MDH. The recommendations originating from this study can be used by departments employing ECG Technicians and by other healthcare professions to further analyse employee engagement and lay the groundwork for an engagement plan that benefits all employees working within MDH. This may help increase retention levels whilst reducing the turnover rate of healthcare employees.

1.5. The research questions

Following review of literature regarding work engagement, three main research questions were identified:

- What are the levels of work engagement among ECG Technicians, as measured by the UWES-17?
- What factors influence work engagement among ECG Technicians employed in MDH?
- What strategies can be employed to promote higher levels of work engagement in the workplace, based on the insights from the UWES-17?

Methodology

A quantitative design in the form of an online questionnaire was implemented. This design was selected for its ability to provide measurable and generalizable insights. The deductive research approach was used as it is closely associated with positivism (Saunders et al., 2009 cited in Al-Ababneh, 2020, p.85) and with quantitative studies (Salomão, 2023). Furthermore, deductive research is frequently used in circumstances when researchers carry out studies based on existing and accepted concepts, in this case the UWES-17.

A normative descriptive research strategy was used to gather, analyse and interpret data to discover trends. ECG Technician's engagement levels were assessed and compared with the original UWES-17 standard data. The study also implemented the descriptive correlational research strategy. The descriptive part of the study aided to summarize the basic characteristics of the sample whilst the correlational research aspect investigated relationships between work engagement and independent variables.

2.1 Data collection and sampling

The population and inclusion criteria included all ECG Technicians employed in MDH. The initial sample size calculated was of 60 ECG Technicians (calculated on a population size of a total of 70 ECG Technicians, a confidence level of 95% and a margin of error of 5%). Self-selection sampling was chosen as participation in this study was voluntary and the questionnaire was distributed to all ECG Technicians working in MDH.

Online questionnaires mainly based on the UWES-17 were distributed to gather quantitative data. Following the necessary permission approvals, these questionnaires were distributed via email - by the ECG Technicians' and Services Manager - where the questionnaire link was provided. Participants were able to access the online questionnaire through Microsoft forms and were given three weeks to complete the online questionnaire, with reminders sent after the first week.

The UWES-17 was selected for its widespread use, evidence-based support, and ability to assess work engagement irrespective of specialization or area of employment (Musenze and Mayende, 2020). A seven-point Likert scale with response options ranging from 0 (never), to 6 (always), was employed to measure the seventeen items that make up the UWES-17.

The questionnaire also gathered information regarding the participants' department of employment and demographic data including age, gender, higher qualification attained, and years of work experience. Questions related to the JD-R model - based on a five-point Likert scale - were included to gather the participants' perspectives on job demands and resources present in their workplace. Data was also gathered on the participants' perceptions of job commitment, motivation, job role satisfaction, and organisation recommendation. The last question was open ended and intended to provide the anonymous participant the opportunity to suggest strategies to improve their work experience.

2.2 The null hypotheses and the research model

The null hypotheses were developed following a thorough evaluation of literature regarding work engagement, theoretical insights, research questions and research objectives. The null hypotheses statements that were tested in this study included the following:

H0_1: There is no significant relationship between higher education levels and work engagement.
H0_2: There is no significant relationship between years of work experience and increased work engagement.
H0_3: There is no significant correlation between gender and work engagement scores.
H0_4: There is no significant correlation between different age groups and work engagement scores.
H0_5: There is no relationship between job satisfaction and work engagement.
H0_6: There is no correlation between professional development opportunities and work engagement levels.

These null hypotheses directed the research project's data analysis and were examined quantitatively utilising techniques such as the Kruskal-Wallis H test and Spearman's rank correlation coefficient test.

The dependent variable (the outcome that was measured) was work engagement whilst the following variables were considered independent since they could influence work engagement: highest education attained, years of experience, gender, age, job satisfaction and development opportunities. The relationships between the independent variables and the dependent variable in this study are depicted in figure 2.1. The model also considers the different null hypotheses that this study evaluates.

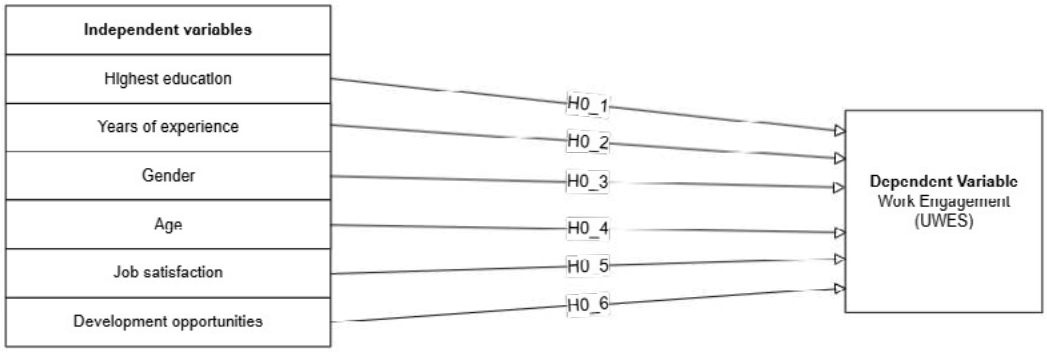


Figure 2.1: The study's research model and null hypotheses

2.3 Data analysis

Quantitative data analysis was executed to test hypotheses and to assess correlations between variables. Descriptive and inferential statistics were the two primary categories of statistical techniques employed. Descriptive statistics were utilised to describe the data sample and collect information regarding the mean, mode, median, standard deviation and skewness statistics. The following features of data could also be identified: the distribution of data, the average of the values, or the central tendency, and the degree of variability. Inferential statistics were then calculated to comprehend the broader population from which the sample of ECG Technicians was drawn. The use of both the Kruskal Wallis H tests and the Spearman's rank correlation coefficient test allowed the researcher to make estimations about the populations and test null hypotheses (Bhandari, 2023c). The SPSS (Statistical Package for the Social Sciences) software was used for all the statistical analysis, validity and reliability tests carried out.

The Kruskal Wallis H is a nonparametric hypothesis test that determines whether there are statistically significant variances between the means of three or more independent variables and is often used to analyse ordinal and continuous data (Frost, 2023). It was utilised in this study to evaluate work engagement levels (as determined by the UWES-17) between several ECG technician groups based on demographic elements such as years of experience, age, gender and education. The Spearman's rank correlation coefficient test, which is also a non-parametric measure of correlation, is represented by ρ, and it quantifies the strength and direction of a relationship between two variables in ranked or ordinal data. The Spearman's rank correlation calculates the correlation between the rankings of the observations in a dataset (McClenaghan, 2024a). This method was utilised to explore the correlations between independent variables and work engagement levels as scored by the UWES-17.

2.4 Ethical considerations

A strict no-harm policy was adhered to, and no physical contact was made with the participants. Participation was based on informed consent and the questionnaires included clear information that informed the participants about their right of withdrawal, the voluntary basis of the questionnaire and the right to skip questions if needed. All necessary steps were taken to ensure that all participants were kept anonymous, and encryption methods were used for storing and transferring data to prevent unauthorized access. Before the questionnaires were officially distributed, official approvals from all relevant authorities were acquired.

Results

As can be seen in table 3.1, 48 ECG technicians participated in this study (a smaller sample size than originally calculated), 27 of which were female and 20 were male. One person chose not to reveal their gender. Age distribution varied, with 24 participants aged 34 years and above and an equal number (24) falling within the '18-34' years bracket, thus suggesting a good level of age diversity in the sample. This was also reflected in the work tenure statistics, with 27 participants having between '0-10' years of work experience and the other 21 having more than 11 years of work experience. Most participants (68.7%) are in possession of a bachelor's degree or higher qualification.

Demographic variable	Category	Frequency	Percentage
Gender	Woman	27	56.25%
	Man	20	41.67%
	Prefer not to say	1	2.08%
Age	18-34	24	50%
	35-64	24	50%
Education	≤ Undergraduate Certificate/Diploma	15	31.3%
	≥ Bachelor's Degree	33	68.7%
Years of work experience	0-10	27	56.3%
	11+	21	43.7%

*Employment departments were not included in this table as many participants worked in multiple departments

Table 3.1: Sample profile

3.1 Descriptive statistics results

A seven-point Likert scale was utilised to measure the seventeen items that make up the UWES-17. To calculate the total average work engagement score, the average engagement score for each participant was calculated (total score of items divided by 17), summed up and divided by the total number of participants (48). This was done by first recoding every answer of the UWES-17 items into numeric figures, for example 'always = 6' and 'never = 0' which resulted in a score that matched the same scale as the individual items on the Likert scale; therefore, since the items were scored 0-6, the average scores similarly ranged from 0-6. Average scores corresponded with the original Likert scale, making them easier to analyse. These calculations were performed according to Schaufeli and Bakker's UWES preliminary manual (2004). Table 3.2 lists all the 17 UWES items and the respective subscales they represent and summarizes the descriptive statistics of the study sample.

UWES item	Subscale	Mean	Sd	Median	Mode	Skewness
1	Vigor 1	3.54	1.336	3	3	-0.093
2	Dedication 1	4.75	1.376	5	5*	-1.776
3	Absorption 1	4.15	1.473	4.50	5	-1.054
4	Vigor 2	3.88	1.496	4	5	-0.692
5	Dedication 2	4.44	1.428	5	5	-1.196
6	Absorption 2	3.17	1.492	3	3	-0.258
7	Dedication 3	4.17	1.521	4	5	-0.862
8	Vigor 3	2.98	1.707	3	5	-0.288
9	Absorption 3	3.69	1.740	4	3	-0.607
10	Dedication 4	5.17	1.310	6	6	-2.158
11	Absorption 4	4.38	1.438	5	5	-1.014
12	Vigor 4	4.04	1.368	4	5	-1.171
13	Dedication 5	3.44	1.515	3	3	-0.029
14	Absorption 5	3.29	1.810	3.50	5	-0.412
15	Vigor 5	3.77	1.477	4	4*	-0.745
16	Absorption 6	2.85	1.650	3	2*	-0.083
17	Vigor 6	4.29	1.414	5	5	-1.017
Total average scores	Vigor	3.75	1.13	3.83	2.83*	-1.015
	Dedication	4.39	1.89	4.6	4.40*	-1.810
	Absorption	3.59	1.22	3.83	2.83*	-1.211
	Engagement	3.88	1.077	4	3.53	-1.361

*Multiple modes exist. The smallest value is shown

**The score range of these scores is from 0 to 6

Table 3.2: Descriptive statistics of the UWES-17 subscales and total average scores

The average engagement score was calculated among the 48 ECG technicians in this sample, as measured by the UWES-17, resulting in a score of 3.88. This score was calculated on a scale of 0 to 6, with greater values suggesting higher levels of work engagement. A mean score of 3.88 indicated that, on average, the participants' work engagement levels ranged from "sometimes" to "often".

The median score was 4, meaning that half the participants reported engagement levels over 4, while the other half ranked below this level. This showed that most ECG technicians reported high levels of work engagement, given that the median is closer to the top end of the engagement scale. The most commonly occurring average score (the mode) was 3.53 which implied that 3.53 was the engagement score recorded by the greatest number of participants (four). The standard deviation was 1.077, suggesting that while most participants had engagement scores close to the average of 3.88, there was some variability in responses. The average engagement score distribution range was 4.59, ranging from a minimum score of 0.59 to a maximum score of 5.18, indicating a substantial difference between the participants' lowest and highest degrees of engagement. Distribution was negatively skewed (-1.361) indicating that most participants reported engagement scores on the higher end of the spectrum whilst a smaller percentage of ECG technicians indicated lower levels of engagement.

3.2 Validity and reliability

Cronbach's Alpha was executed to evaluate the UWES-17 internal consistency. A Cronbach's Alpha coefficient of 0.940 was measured, indicating high levels of reliability. Two tests were performed to assess the validity of the data gathered: the Bartlett's Test of Sphericity and the Kaiser–Meyer–Olkin (KMO) Measure of Sampling Adequacy. The KMO score was 0.840, indicating that the UWES-17 items in this study sample had very acceptable sampling adequacy. With a p-value of less than 0.001 and a chi-square statistic of 597.601, the results of Bartlett's Test of Sphericity were also significant, thus implying that the UWES-17 items of vigour, dedication, and absorption had strong correlations.

3.3 Inferential statistics

The null hypotheses relating to demographics were investigated using the Kruskal Wallis H test to compare work engagement scores across these groups. The measured p-value was of great relevance; if the p-value was greater (>) than 0.05 (the conventional significance level), the null hypothesis was not rejected; if lower (<) than 0.05, it was rejected. Results indicated that there were no statistically significant differences in average engagement scores in these groups and therefore all hypotheses relating work engagement to demographic data could not be rejected. Table 3.3 summarises the Kruskal Wallis H test scores and corresponding P-values.

Independent Variable	Kruskal Wallis H score	P-value
Highest education/qualification	7.655	0.265
Years of work experience	2.452	0.784
Gender	4.126	0.127
Age	0.193	0.979

Table 3.3: Kruskal Wallis H test results

The spearman's rank correlation coefficient test was implemented to assess correlations between all independent variables considered for this study and the dependent variable, i.e. work engagement. The null hypotheses regarding job satisfaction, development opportunities and subsequent engagement levels were rejected, as this study revealed a moderate positive correlation (p-value < 0.05) between these variables and average engagement scores. Accordingly, as opportunities for professional development and job role satisfaction increased, the average engagement scores increased as well. Correlations between demographic data and work engagement were found to be statistically insignificant (p-value > 0.05), although several weak correlations were found. Table 3.4 summarizes the null hypotheses tested, whether there were significant correlations between work engagement and the independent variables and if the null hypotheses could be rejected or not.

Null hypotheses	Dependent Variable	Independent variable	Statistical test	Key findings	P-value	Result
H0_1	Work engagement	Highest education	Spearman's Correlation (ρ)	Weak positive correlation (ρ = 0.279)	0.055	Null hypothesis was not rejected
H0_2	Work engagement	Years of experience	Spearman's Correlation (ρ)	Weak negative correlation (ρ = -0.106)	0.474	Null hypothesis was not rejected
H0_3	Work engagement	Gender	Spearman's Correlation (ρ)	Weak negative correlation (ρ = -0.185)	0.207	Null hypothesis was not rejected
H0_4	Work engagement	Age	Spearman's Correlation (ρ)	Very weak negative correlation (ρ = -0.037)	0.803	Null hypothesis was not rejected
H0_5	Work engagement	Job satisfaction	Spearman's Correlation (ρ)	Moderate positive correlation (ρ = 0.411)	0.004	Null hypothesis rejected
H0_6	Work engagement	Development opportunities	Spearman's Correlation (ρ)	Moderate positive correlation (ρ = 0.356)	0.013	Null hypothesis rejected

Table 3.4: Correlation analysis summary

3.4 Job-Demands and Resources

Participants were asked questions - based on the JD-R model - about job demands and resources. The questions included three items associated with job demands (workload, emotional demands and time-pressure) and four items related to work resources (autonomy, job support, development opportunities and feedback).

Most participants (43.8%) agreed they experienced an overwhelming workload, but this showed no correlation with engagement scores (ρ = -0.004, p = 0.978). ECG technicians agreed (47.9%) or strongly agreed (37.5%) that their job roles involved high emotional demands; however, the weak positive correlation with engagement (ρ = 0.177) was not statistically significant (p = 0.229). With regards to time pressure, 50% of participants agreed they experienced time constraints during patient care, yet the weak negative correlation with engagement (ρ = -0.049) was not statistically significant (p = 0.740).

Most participants (50% agreed, 20.8% strongly agreed) felt they had opportunities for professional development. This showed a statistically significant moderate positive correlation with work engagement (ρ = 0.356, p = 0.013). Many participants (64.6% agreed, 14.6% strongly agreed) reportedly received adequate work support, which showed a weak but statistically significant positive correlation with work engagement (ρ = 0.294, p = 0.043). Sixteen ECG technicians (66.7%) agreed and one (4.2%) strongly agreed that they received regular work feedback. Although this was weakly to moderately positively correlated with engagement (ρ = 0.265), the result was not statistically significant (p = 0.069). Most participants (66.7% agreed, 18.8% strongly agreed) felt autonomous in their tasks, but autonomy showed a weak negative, non-significant correlation with engagement scores (ρ = -0.175, p = 0.235).

3.5 Commitment, organisation recommendation, and job satisfaction

A total of 39.6% participants answered that they were "very committed" and another 39.6% reported that they were "committed." A moderate, positive and statistically significant correlation connecting work commitment with work engagement ($\rho = 0.491$, $p < 0.001$) was thus identified. Most participants were "somewhat likely" (37.8%) or "very likely" (35.4%) to recommend their organisation as a good place to work. This showed a significant moderate to strong positive correlation with engagement scores ($\rho = 0.548$, $p < 0.001$. More than half of the participants (52.1%) reported feeling satisfied with their job role, while 29.2% answered that they were "very satisfied." A moderate positive correlation was found between job satisfaction and work engagement ($\rho = 0.411$), indicating that higher satisfaction was associated with greater work engagement scores. This relationship was statistically significant ($p = 0.004$).

3.6 Motivational factors and suggested changes to improve the work experience

Participants were asked what factors motivated them in their workplace. Table 3.5 summarises the number of times these different factors were chosen.

Motivational factors	Selection frequency of these factors
Job security	30
Salary and associated benefits	30
Professional development opportunities	20
Team collaboration	19
Work-life balance	12
Recognition	11

Table 3.5: Motivational factors at work

In the last questionnaire item, participants were given the opportunity to suggest possible changes to improve their own work experience. The most frequent answers were related to more effective communication from the management, better educational and professional development opportunities, more flexible working hours, increased employee well-being and support services, regular staff and multidisciplinary team meetings, increased feedback offered, better salaries and more efficient distribution of human resources (HR).

Discussion

This study revealed a total average engagement score of 3.88. When compared to the UWES-17 original norm scores, this value formed part of the "average" bracket (3.07 - 4.66), thus indicating an average engagement level among ECG Technicians in the sample. Table 4.1 depicts the norm range scores of the original UWES-17's subscales and total score (Schaufeli and Bakker, 2004).

	Vigor	Dedication	Absorption	Total score
Very low	≤ 2.17	≤ 1.60	≤ 1.60	≤ 1.93
Low	2.18 – 3.20	1.61 – 3.00	1.61 – 2.75	1.94 – 3.06
Average	3.21 – 4.80	3.01 – 4.90	2.76 – 4.40	3.07 – 4.66
High	4.81 – 5.60	4.91 – 5.79	4.41 – 5.35	4.67 – 5.53
Very high	≥ 5.61	≥ 5.80	≥ 5.36	≥ 5.54
M	3.99	3.81	3.56	3.82
SD	1.08	1.31	1.10	1.10
SE	.01	.01	.01	.01
Range	.00 – 6.00	.00 – 6.00	.00 – 6.00	.00 – 6.00

Table 4.1: Norm scores for the UWES-17
Source: Schaufeli and Bakker, 2004, table 33, p. 37.

The average engagement levels among ECG Technicians in the sample were generally neither too high nor too low. Excessive work engagement must be considered when assessing these scores as it may have a negative influence on health and job performance (Shimazu et al., 2018). Studies reveal that excessive energy and time spent at work can lead to increased job demands and work-home conflicts, as well as insufficient possibilities for recovery and rest (Beckers et al., 2004). Prolonged high levels of work engagement may lead to chronic stimulation, with undesirable side effects such as psychological distress (Shimazu et al., 2018). According to Bakker, Albrecht, and Leiter (2011), there is a limit for work engagement.

4.1 The null hypotheses: Work engagement versus independent variables

Null hypothesis 1 (H0_1) - Work engagement and highest education levels.

The null hypothesis (H0_1) proposing that there was no significant correlation between higher education levels and work engagement could not be rejected.

Different correlations between education and work engagement across healthcare jobs have been observed in previous studies. A study conducted by Hakanen et al., (2019) and based on the UWES, found a clear trend between education levels and work engagement; employees with higher educational attainment were more engaged in their work, whereas those with lower education were less engaged. Studies by Aboshaiqah et al., (2016) and Ghazawy et al., (2019) revealed that nurses with higher qualifications reported higher engagement scores and that additional qualifications were linked to increased job satisfaction. On the other hand, in a hospital-based study evaluating work engagement and its determinants, work engagement was examined among groups with different educational degrees with results showing that educational levels had no significant effect on job engagement (Mahboubi et al., 2014).

Future research should explore the relationship between education and job-specific resources, such as workload management, mentorship, or procedural training and their influence on work engagement among ECG Technicians. Understanding these associations may help identify which interventions are most effective for improving work engagement.

Null hypothesis 2 (H0_2) - Work engagement and years of experience.
The null hypothesis proposing that there was no significant correlation between increased years of work experience and higher engagement levels could not be rejected.

Although previous studies indicated a positive relationship between increased years of work experience and work engagement, these new findings supplement conflicting data in work roles unique to the healthcare industry. Numerous studies argue that increased work experience results in a more stable personality, higher capacity for adaptation and problem-solving, and greater passion for one's duties (Mahboubi et al., 2014).

Other studies found a negative correlation, that is, as years of experience increase, work engagement decreases. According to a study by Hinzmann, Rašticová, and Šácha (2019), the highest levels of work engagement (68%) in a particular organisation were observed among new recruits. Engagement was at its peak during the first two years of work and declined by 10% as seniority increased. Similarly, in this study, the very weak negative correlation observed suggested that engagement scores had a slight tendency to decline as years of experience increased. ECG technicians may experience apathy or burnout as their work experience grows, which could counteract the engagement benefits of work expertise.

Null hypothesis 3 (H0_3) - Work engagement and gender.
The third null hypothesis (H0_3) assuming that there was no significant correlation between different gender groups and average work engagement scores was not rejected.

According to a UWES study that employed samples from ten different countries, work engagement and gender had weak but ambiguous correlations. Additionally, the relationship with gender varied across different countries (Schaufeli, Bakker, and Salanova, 2006). Other findings (Schaufeli, Bakker, and Salanova, 2006; Sprang et al., 2007) indicated that women were more likely to experience stress because of conflicting work and household responsibilities and may report lower levels of engagement and higher levels of burnout. On the other hand, other studies indicated that female employees were more engaged than their male equivalents, as they tend to be more responsible and composed (Hakanen et al., 2019; Shukla, Adhikari and Singh, 2015).

ECG technicians could have experienced similar job demands and resources, which could have reduced disparities in work engagement levels regardless of gender. Additionally, local gender inclusion policies and an organisational culture that promotes equality (Cassar, Cutajar, and Thake, 2022) may have helped to create more consistent levels of work engagement between sexes. Ultimately, strategies to increase work engagement should be inclusive and target all ECG technicians rather than being gender specific.

Null hypothesis 4 (H0_4) - Work engagement and age

The null hypothesis (H0_4) proposing that there was no correlation between different age groups and work engagement scores could not be rejected.

The research findings contrasted with other studies, where increased age correlated with higher levels of work engagement (Fiorini, Griffiths and Houdmont, 2021; Hakanen et al., 2019; Mahboubi et al., 2014; Schaufeli, Bakker, and Salanova, 2006). According to Douglas and Roberts (2020), older workers are more engaged at work because they have more individual competences which give them more resources to handle job demands. Wan et al., (2018b) discovered that youngest and oldest nurses were more engaged than those between the ages of 25 and 44. On the other hand, Aboshaiqah et al., (2016) identified a negative link between age and work engagement. Older workers may be perceived as less driven and having fewer opportunities for advancement, especially if progressing towards retirement. As a result, they may gradually reduce their work commitment and disconnect from their work roles (Damman, Henkens, and Kalmijn, 2011).

In this study, there was no statistically significant correlation between age and work engagement, indicating that engagement levels most likely remained consistent throughout different age groups. This concurred with earlier research conducted by Shukla, Adhikari and Singh (2015).

The fact that there was no discernible age-related difference in engagement levels may be due to features unique to the ECG Technician position and jobs' nature, which are largely consistent across experience and age levels. This study's results suggest that initiatives to improve work engagement should concentrate on providing resources that assist all ECG technicians, rather than just targeting age groups.

Null hypothesis 5 (H0_5) - Work engagement and job satisfaction

The fifth null hypothesis (H0_5), stating that there was no relation between job satisfaction and work engagement, was rejected.

Findings were in line with previous studies that showed how work engagement had a positive correlation with job satisfaction and other elements such as employee wellbeing, commitment, trust, and retention. Personnel who are engaged at work are more likely to have their physical, mental, or self-actualization requirements met by the organisation, which leads to higher job satisfaction (Saks, 2006; Hlongwane and Ledimo, 2015; Pohl and Galletta, 2016; Keyko et al., 2016). The sustainability of healthcare systems depends on establishing a work environment that supports both work engagement and job satisfaction (Al-Sheyab, 2018).

Null hypothesis 6 (H0_6) - Work engagement and professional development opportunities.

The last null hypothesis (H0_6) stating that there was no significant correlation between professional development opportunities and work engagement was rejected.

Studies show that professional development initiatives increase job satisfaction by boosting employees' self-esteem, work autonomy, and positive sentiments towards their workplace and employers (Jin and Lee, 2012 cited in Karaferis et al., 2022, p.222). Training and development opportunities may have helped ECG technicians feel more valued and stay up to date on best practices, which may have led to increased work engagement levels.

Training, development and performance improvement should be important HR management practices. Ongoing evaluations, general skills training, and strategic recruitment are other HR procedures that should be carried out (Bakker, 2017). Continuous education has a particularly significant impact on ECG technicians since it coincides with both professional and interpersonal responsibilities.

4.2 Job demands, job resources and motivational factors

Participants reported high levels of both job demands and resources; however, the effect of job demands on work engagement was minimal. This implied that most ECG Technicians in the sample possessed high levels of personal resources such as optimism, commitment, and self-efficacy and thus were capable of effectively managing job related difficulties and challenges (Bakker, 2011). Another possibility was that participants could handle high job demands because they had access to a variety of work resources (Bakker and Albrecht, 2018). The most common motivating factors identified by participants were salary and benefits, job security, professional development opportunities and team collaboration. These findings align with Malta's National Employee Engagement Survey (2023), where employees valued wages, working conditions, and growth opportunities. The participants' suggested workplaces changes—increased professional growth opportunities, fair salaries, flexible schedules, and work-life balance measures—reflected these motivations. The findings highlight the importance of clear and transparent communication to boost engagement and trust. Employers should address gaps between perceived and actual development needs whilst aligning organisational policies with employee expectations to improve retention and create a positive work environment (Malta Chamber of SMEs, 2024).

4.3 Limitations

The sample size was smaller than expected (48), thus increasing the margin of error from 5% to 7.99%, suggesting lower estimate precision. Even though the results were still legitimate, this wider margin of error implied that findings should be regarded as exploratory or preliminary. Limited demographic variety may have impeded the generalisability of the findings in this study. The sample may not have accurately reflected the general population of ECG technicians as certain age groups, education levels, genders, or years of experience were over or under-represented. Employing self-reported questionnaires may have introduced answer bias and participants may have answered in socially acceptable ways rather than accurately reflecting their genuine experiences or feelings. Individual opinions and perspectives on work engagement might differ substantially, making objective evaluations difficult and answers could have been impacted by recent work or life experiences. The cross-sectional design of this study posed a significant limitation as it collected and analysed data at a single point in time which limited the possibility to monitor patterns or shifts in work engagement levels and independent variables among participants throughout the years.

4.4 Practical recommendations

To preserve balance across the work engagement subscales—vigour, dedication, and absorption—targeted measures are needed. Physical, low-effort activities and exercise programs can be developed to maintain and improve vigour and energy levels, increase mental clarity, recovery, and relaxation (Bakker, 2017). Furthermore, employees may be able to manage stress, adopt and maintain improved lifestyles through the introduction of these health-promoting activities (Strijk et al., 2013). To prevent work dedication and absorption from deteriorating into work addiction and workaholism, it is critical to develop official policies and regulations that forbid excessive work hours and workload, instruct employees to recognise the indications of workaholism, and provide them with the necessary work support (PrideStaff, 2017).

The correlations between work engagement and factors such as job satisfaction, professional development possibilities, work support, commitment, and organisational recommendation were statistically significant, thus providing practical recommendations for boosting work engagement.

Effective ways to foster both work engagement and job satisfaction include providing opportunities for professional growth, providing work feedback, and ensuring adequate work resources and reasonable workloads to avoid burnout (Al-Sheyab, 2018). Management and policymakers should develop a humanistic, supportive work environment that gives employees a sense of belonging to their organisation. This includes fostering an atmosphere that values equality in the workplace, organisational support, trust, and empowerment (Yildiz and Yildiz, 2022).

Providing opportunities for continuous improvement not only increases engagement but may also enhance patient outcomes and service quality. Given the positive relationship observed in this study between work engagement and development opportunities, management must continue to invest in professional development programs, such as advanced cardiology procedure training, new equipment familiarisation, and interpersonal skills workshops, which can help ECG Technicians retain proficiency and learn new skills.

4.5 Future research

A greater sample size in subsequent studies may increase accuracy of findings. Longitudinal studies can be implemented to further comprehend the dynamic nature of work engagement throughout the years and to assess the effectiveness of potential interventions aimed at improving work engagement.

Comparative studies can be conducted to examine levels of engagement among different health professions to determine profession-specific characteristics and behaviours. To gain a deeper understanding of work engagement, future research can also amalgamate quantitative results with qualitative techniques such as interviews or focus groups.

Conclusion

This study examined work engagement among ECG technicians and the factors that may influence it. Findings revealed significant positive correlations between work engagement and factors such as job satisfaction and opportunities for professional development, highlighting their key role in enhancing engagement levels. In contrast, variables such as education, gender, years of experience, and age showed weak, non-significant associations, thus challenging certain assumptions present in earlier research. These results underscore the need for tailored strategies that address the specific needs and motivations of ECG technicians.

Conflict of Interest

The researcher is a professional at Mater Dei Hospital under study. The researcher had no direct contact with any of the research participants, avoiding any bias.

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03 Emotional intelligence in effective leadership within the Maltese social sector: A qualitative study

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Abstract

Leadership within the social sector is inherently complex, requiring not only strategic competence but also emotional depth. Emotional intelligence (EI) has gained prominence in leadership research for its association with employee well-being, retention, and organisational effectiveness. Yet, within the Maltese social sector, the emotional dimensions of leadership remain underexplored, with limited attention to how leaders themselves perceive and cultivate EI. This study addresses this gap by examining how social sector leaders understand, develop, and apply EI in practice, highlighting the competencies and contextual challenges that shape emotionally intelligent leadership in human service environments.

Objectives: To explore how leaders in Malta's social sector understand and enact self-awareness as a component of emotional intelligence in day-to-day leadership.

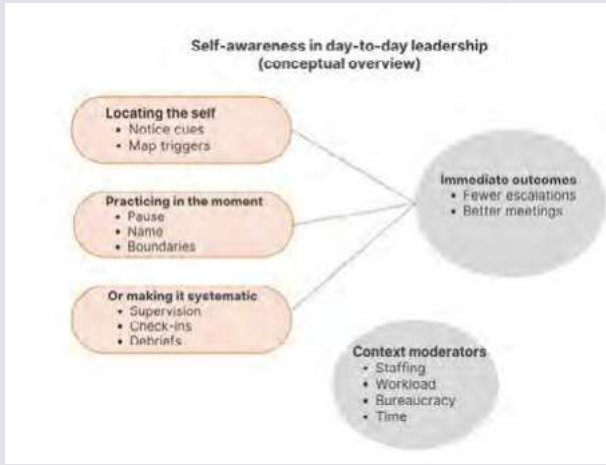
Methods: An interpretivist qualitative design was employed. Eight leaders overseeing services for vulnerable groups participated in semi-structured interviews. Data were analysed inductively using Braun and Clarke's six-step reflexive thematic analysis. Credibility was enhanced through researcher reflexivity, member checking, and triangulation of interview contexts.

Results: Three interlocking themes were identified. (1) Locating the self: self-awareness was described as noticing physiological and affective cues and mapping personal triggers anchored in values and biography. (2) Practising self-regulation in the moment: awareness was translated into micro-practices—purposeful pausing, concise emotion-naming, boundary-setting, and perspective-taking—to maintain constructiveness during conflict and to support psychological safety. (3) Making self-awareness systemic: leaders sought to embed routines such as reflective supervision, incident debriefs, and brief team check-ins; workload, staffing pressures, and bureaucratic demands constrained these efforts.

Conclusion: The analysis specifies the micro-mechanisms through which self-awareness becomes observable leadership practice rather than an abstract trait. Development pathways were largely informal and contingent on role models and reflective spaces. The findings support targeted, context-sensitive programmes that cultivate self-awareness within leadership development and organisational design

Keywords: "Emotional intelligence"; "self-awareness"; "leadership"; "social care"; "qualitative design"

The following image shows that leaders in Malta's social sector regard self-awareness as a learnable skill, nonetheless limited by workload and structural pressures.



Graphical Abstract

Highlights:
- Employs a qualitative, theme-based analysis drawing on rich narrative accounts of leaders, capturing lived practices of emotional intelligence.
- Introduces a multi-level framing (individual, team, organisational) to trace how self-awareness scales from personal skill to systemic routine.
- Identifies a dynamic cycle of self-awareness: inner noticing, in-interaction micro-practices, and institutionalised team routines.
- Shows how leaders embed emotional intelligence into daily work through supervision, check-ins, debriefs, and feedback practices.
- Provides evidence-based recommendations for policymakers and organisational leaders to design systems that safeguard staff well-being while meeting service pressures.

Introduction

Emotional intelligence (EI) has become a central explanatory construct for effective leadership in human services, domains marked by relational intensity, emotional complexity, and persistent resource constraints (Cherniss & Goleman, 2001; Goleman, 1995). Across ability, trait, and mixed-model accounts, self-awareness consistently emerges as a foundational capacity, recognising one's own emotional states, understanding their antecedents, and anticipating their interpersonal effects (Miao, Humphrey & Qian, 2018). In practice, these capabilities support leaders' ability to regulate responses, model composure, and foster climates of trust that enable staff voice, learning, and resilience.

In human services, leadership approaches such as transformational, servant, and authentic leadership all presuppose a degree of self-awareness. Transformational leadership's idealised influence, servant leadership's humility, and authentic leadership's emphasis on self-knowledge and relational transparency all rely on leaders' capacity to notice and regulate emotion in situ (Miao et al., 2018; Mahon, 2021). Empirical work links these styles to outcomes such as staff engagement, trust, and reduced burnout, while effective leaders appear able to flex among styles, implying meta-cognitive awareness of both stance and context. Evidence also highlights the importance of reflective infrastructures—supervision, coaching, and 360-degree feedback—for translating awareness into habitual practice, whereas one-off workshops show limited impact without ongoing organisational support (Boyatzis, McKee & Johnston, 2008; Cherniss & Goleman, 2001).

Despite broad agreement on EI's importance, gaps remain. First, research often treats EI as a global construct, leaving underexplored the mechanisms by which self-awareness translates into observable leadership practice. Second, studies frequently rely on employee perceptions or global EI scores rather than leaders' own accounts, limiting insight into how leaders themselves construe and enact self-awareness.

This study addresses these gaps through a practice-oriented research question: **How do leaders in Malta's social sector understand and enact self-awareness as a component of EI in their day-to-day leadership?** Social sector organisations reflect global pressures—rising demand, extensive documentation requirements, and staffing constraints—conditions under which leaders must reconcile client risk, staff well-being, and organisational accountability (Angus, 2022; Smith, 2020). Within such contexts, self-awareness functions as a practical resource for managing conflict, allocating attention, and shaping team climates.

The contribution of this article is twofold. Conceptually, it grounds EI in situated leadership practice by specifying how self-awareness is enacted through micro-practices such as pausing, emotion-naming, boundary-setting, and perspective-taking, and how these underpin downstream capacities of empathy, adaptability, and relationship management. Practically, it identifies the largely informal and experiential pathways through which leaders develop these capacities and highlights organisational conditions that enable or constrain their uptake. By linking individual awareness to interactional practices and organisational routines, the study offers a framework for understanding how self-awareness becomes a collective resource in emotionally demanding service environments.

Methodology

An interpretivist qualitative design was employed to examine how self-awareness is understood and enacted within day-to-day leadership practice in Malta's social sector. The approach privileges thick description and attention to context, with analytic emphasis on underlying processes rather than on estimating prevalence (Fuchs, 2023).

Purposive sampling identified eight leaders from diverse services within the sector, comprising three in managerial roles and five team leaders.

Their professional backgrounds encompassed social work, psychology, and youth work. Two managers and one team leader additionally held formal qualifications in leadership and management. All participants had a minimum of one year of experience in a leadership role, with their experience ranging from one to more than ten years. Participants held responsibility for teams supporting adults and families in community-based settings. Heterogeneity across service types was sought to maximise informational richness while maintaining a consistent emphasis on leadership roles.

Data were generated through semi-structured interviews of approximately 60 minutes' duration. Six interviews were conducted in person, and two online to accommodate scheduling and access. The interview guide elicited concrete accounts of emotionally charged leadership moments, routine reflective practices, and perceived links between self-awareness and team outcomes. With informed consent, interviews were audio-recorded and transcribed verbatim. To promote comfort and openness, interview locations were chosen by participants.

Ethical approval was obtained from the IDEA College Research Ethics Board. Participation was voluntary. Confidentiality was assured using pseudonyms and the removal of identifying details. All data were stored securely and de-identified before analysis.

The analysis proceeded inductively using Braun and Clarke's reflexive thematic analysis. The six phases—familiarisation, generation of initial codes, construction of candidate themes, review of themes, defining and naming themes, and production of the analytic narrative—were followed iteratively (Saunders et al., 2023). Coding focused on (a) leaders' definitions of self-awareness; (b) micro-practices enacted during challenging interactions; and (c) routines or structures designed to institutionalise self-awareness at team or organisational levels. Analytic memos documented decision points and reflexive considerations throughout.

Rigour was supported through multiple strategies: reflexive journalling to surface researcher assumptions; peer debriefing to scrutinise early coding and theme development; member checking for resonance; and triangulation across interview contexts (in person/online and across different service types). An audit trail recorded coding iterations and theme refinements to enhance dependability and transparency.

Findings

In addressing the research question—how leaders in Malta's social sector understand and enact self-awareness as a component of emotional intelligence in day-to-day leadership—we identified three interlocking themes that progress from inner noticing, through interactional practice, to organisational routines. These themes are summarised in the table below and elaborated in the sections that follow.

Theme	Focus (what it is)	Core micro-practices (how it shows)	Team routines / Example
Locating the self	Disciplined noticing of body/affect; mapping personal triggers; treating emotions as information aligned with values.	Spot micro-signals (tight chest, shallow breathing, faster speech); name state silently ("defensive," "rushed"); pause to widen choice; link triggers to biography/values.	Mentoring + feedback consolidate skill; early-career episodes cited. Quote: "Being aware is essential but not sufficient… learning to express emotions positively is different."
Practising in the moment	Brief, observable behaviours that stabilise self and keep exchanges problem-solving focused.	Purposeful pause (sometimes signalled); concise emotion-naming; boundary-setting (decision rights, time limits, feasible support); rapid reframing/perspective-taking.	Self-disclosure is brief and task-relevant; modelling calm reduces defensiveness. Quote: "Answer when calm and contained. The leader is a role model."
Making it systemic	Embedding self-awareness as predictable, task-focused routines that scale from person to team.	Model apology; solicit feedback; acknowledge limits; keep check-ins/debriefs short and on-task.	Reflective supervision prompts; 60-sec check-ins; brief post-incident debriefs. Needs protected time/clear roles. Quote: "Processing and reflection are part of the service culture… new members gradually engage."

Table 1: Cycle: inner noticing → micro-action in interaction → team routine. Use scripts (pause–label–boundary–reframe) + light-touch rituals to sustain practice

Locating the self:
Leaders characterised self-awareness as the disciplined recognition of physiological and affective cues and the anticipation of their interpersonal consequences, coupled with the mapping of personal triggers grounded in values and biography. Reported "micro-signals" (tightness in the chest, shallow breathing, quickened speech) served as early indicators of escalation, typically elicited by predictable triggers such as perceived unfairness toward staff or clients, sudden policy changes and high-stakes safeguarding decisions. Over time, consciously mapping these triggers increased perceived choice at precisely the moments when automatic responding is most likely. One of the participants accentuated this by claiming that being aware is essential but not sufficient: **"How you are going to express your emotions is important, as it is easy to be aware that you are angry and choose to express those feelings by shouting, but learning to express emotions positively is different."** Participants linked this work to enduring commitments to dignity, justice and reliability, reframing difficult emotions as information rather than defects, while brief internal naming of state (e.g., "becoming defensive," "feeling rushed") created space for deliberation. Early-career episodes and exposure to diverse mentors were repeatedly cited as formative, supporting the view—central to the research question's "understand" component—that self-awareness is a skill set consolidated through practice and feedback rather than a fixed disposition.

Practising in the moment:
Self-awareness was enacted through brief, observable micro-practices that stabilised the self and oriented routine interactions toward problem-solving with fewer escalations. Leaders described purposeful pausing—sometimes signalled explicitly—to regulate physiology and mark intentionality, particularly when information was incomplete or tensions were rising. One of the participants highlighted that **"If you feel that it is not the right time to address or answer, maybe because someone is testing you, you should take your time and answer maturely when you are calm and contained. The leader is a role model for the team; hence, his behaviour is crucial"**. Concise emotion naming normalised affect, reduced the scope for blame, and lowered defensiveness; any self-referential disclosures were kept brief and strictly 'task relevant'. Boundary-setting anchored empathy to role by clarifying decision rights, time limits and feasible support, preserving reliability for staff and service users. Rapid perspective-taking and reframing ("what might be missing here?", "what in our system made this likely?") shifted conversations from fault-finding to process learning. These accounts specify how the "enact" dimension of the research question materialised at the level of observable behaviour in everyday work.

Making it systemic:
Leaders sought to render self-awareness collective and durable by embedding it in organisational routines—reflective supervision, brief meeting check-ins, post-incident debriefs and reciprocal feedback. In supervision, simple, consistent prompts surfaced what had "stayed" from the previous week and built a shared lexicon for noticing and naming states. Check-ins at the start of meetings and short debriefs after critical incidents created predictable spaces for mutual regulation and joint sense-making, with an explicit emphasis on keeping these practices contained and task-focused rather than drifting into therapy-like discussion. Deliberate modelling of apology, solicitation of feedback and acknowledgement of limits reduced status barriers and strengthened psychological safety. Sustainability was constrained by workload, staffing and bureaucratic demands, revealing the need for protected time and clear role expectations to support these routines. Synthesised across themes, self-awareness forms a dynamic cycle—inner noticing, in-interaction micro-action and team-level routine—through which individual competence can scale to collective habit, thereby demonstrating how leaders both make sense of self-awareness and put it to work in day-to-day leadership.

One participant explained how EI is ingrained in the team culture: **"In some teams, processing and reflection are part of the service culture and part of the daily conversations... it comes naturally... it is so ingrained that new team members gradually begin to engage in similar discussions easily".**

Discussion

The findings are positioned as showing self-awareness to function as a practical technology of leadership in human service settings, consistent with mixed-model accounts of emotional intelligence that place self-awareness at the root of self-management, social awareness, and relationship management (Cherniss & Goleman, 2001; Goleman, 1995). Rather than being treated as a static trait, self-awareness is described by leaders as a repertoire of context-sensitive practices that can be recognised by teams and cultivated over time. This framing helps to explain why meta-analytic evidence has linked emotional intelligence to leadership effectiveness across settings (Miao, Humphrey & Qian, 2018): effects are realised through micro-behaviours—purposeful pausing, concise emotion-naming, boundary-setting, and rapid perspective-taking—by which inner noticing is translated into interactional traction. A mechanism is thereby added to the literature, as the movement from awareness to impact under conditions of ambiguity, time pressure, and potential escalation is specified.

A shift is suggested from "who the leader is" to "what is done when it matters." Self-awareness is framed as an ethically anchored discipline in which cues are noticed, states are named, and responses are aligned with values such as dignity, justice, and reliability. The brief, publicly legible nature of these micro-practices is emphasised. When a pause is signalled, a state is named in one line, or decision rights are clarified, behaviours can be recognised and learned by team members. Thus, the cycle identified—inner noticing → micro-action in interaction → embedding in routine—is presented as a portable architecture of practice that can be adopted without extensive time investment or therapeutic depth.

Developmental pathways are described as primarily experiential and relational. Reflective supervision, peer modelling, and feedback are reported more frequently than formal curricula, aligning with scholarship in which emotional-intelligence competencies are treated as learnable, socially situated, and reinforced through practice in context (Cherniss & Goleman, 2001; Miao et al., 2018). As a result, the primary organisational lever is cast not as selection for presumed traits but as the design of roles, cadences, and micro-routines that elicit and reward self-aware practice in situ. In practical terms, lightweight rituals (such as 60-second check-ins and 10-minute debriefs) and simple scripts (one-line emotion naming, boundary statements) are recommended as brief, predictable, and task-relevant. Because these moves are observable, diffusion through modelling is facilitated, with psychological safety and process learning strengthened consequently.

A central tension is nonetheless highlighted- that of sustainability. Emotional availability is finite, and chronic overload is observed to narrow attentional bandwidth, increasing the likelihood of reactive decisions and relational drift. Accordingly, an intersection is drawn between self-awareness and structural leadership: boundaries on availability must be set, decision-making should be distributed, and protected reflective spaces should be created. It is warned that organisations valorising "EI" while neglecting workload, role clarity, and support structures risk eroding the very qualities sought (Mahon, 2021). Hence, permission structures (agreed pause signals, time-boxed debriefs) are indicated as necessary to protect regulatory capacity, and reflective time is to be treated as an operational necessity rather than a discretionary extra.

Contextual features of Maltese human services are noted as adding texture to these claims. High-stakes safeguarding, abrupt policy shifts, and resource constraints are frequently encountered, making brief, teachable routines that channel self-awareness into reliable interactional moves especially valuable because minimal time is required and scaling through imitation is enabled. Given the emphasis on fairness to staff and service users, boundary-setting with empathy is presented not merely as self-protective but as foundational for consistent service delivery. Where such routines are embedded, it is reported that new team members tend to "catch" the culture, indicating a social-learning pathway capable of stabilising teams during turnover.

Implications for capability building and HR practice are also identified. Recruitment and promotion processes are proposed to include structured simulations that elicit target micro-practices (pausing under pressure, task-relevant emotion naming, delivery of boundary statements) rather than relying on self-report or global EI measures. Supervision guidelines are recommended to standardise a minimal viable ritual— how supervision is delivered, what stayed with the practitioner, what was noticed in self, what was tried—thus maintaining an emphasis on practice and feedback over abstraction. Leadership development is suggested to privilege peer coaching and micro-drills embedded in routine meetings so that improvement is rendered iterative and low burden. By these means, investment is shifted from one-off training to everyday design.

Limitations are acknowledged. The sample was small and context-specific, and the data were self-reported. Observational or multi-informant designs are proposed to test whether the reported micro-practices produce the claimed effects on team functioning. Future studies may experimentally introduce lightweight routines—brief meeting check-ins, structured debriefs, or "three-step pauses"—and assess downstream outcomes such as team climate, escalation rates, burnout, and retention, thereby extending the empirical basis for the mechanisms surfaced (Miao et al., 2018; Mahon, 2021). Mixed-methods approaches could further link physiological indicators (e.g., heart-rate variability during difficult conversations) with behavioural markers (use of pause/label/boundary moves) and staff-reported climate, tightening the evidential chain from inner noticing to organisational effect.

Conclusion

The contribution of this study is presented as a specification of how self-awareness becomes operational in everyday leadership- through brief, observable micro-practices and minimal routines that are ethically anchored, teachable, and sustainable when scaffolded appropriately. By redirecting attention from trait attributions to practice architectures, the findings help to explain why emotional intelligence predicts leadership effectiveness and point to concrete levers—cadence design, modelling, and protected time—by which emotionally intelligent leadership can be cultivated at scale (Cherniss & Goleman, 2001; Goleman, 1995; Mahon, 2021; Miao et al., 2018).

Leaders described noticing internal cues, converting awareness into targeted micro-actions during interaction and building routines that make such practices likely across teams. Constraints of workload, documentation and staffing limit the depth and frequency of this work, yet the practices themselves are low-cost, teachable and closely aligned with everyday leadership tasks. In relation to the research question, the study indicates that self-awareness is both a way leaders understand their own positioning and a set of enacted behaviours that shape team climate when supported by clear roles and protected reflective time.

Ultimately, the research accentuates a simple yet powerful insight: emotionally intelligent leadership is a practical, actionable discipline, not an abstract ideal. Even in high-pressure environments, small, consistent practices—pausing, naming emotions, setting boundaries—can profoundly influence team well-being, service quality, and ethical leadership. For the Maltese social sector, fostering these habits systematically, through training, reflective supervision, and organisational support, offers a pathway to more resilient, effective, and compassionate leadership.

Conflict of Interest

The authors declare no conflict of interest

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04 The Acceptance of Robotic Systems for Nursing Care at St. Vincent De Paul: A Quantitative Study

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Abstract

Objectives:
This study aimed to investigate the acceptance of robotic systems among nurses in a long-term care facility. The objectives were to assess nurses' acceptance of robotic systems, their perceived benefits and ease of use, consider ethical issues, and identify concerns about integrating these systems into the long-term care facility.

Methods:
A cross-sectional observational design was used, based on a post-positivist perspective. A self-administered questionnaire was the data collection tool used. The Technology Acceptance Model was used as a theoretical framework to design the questionnaire. Questions on Perceived Usefulness, Perceived Ease of Use, Behavioural Intention to Use, and External Factors, such as ethical concerns, that can influence acceptance of technologies was developed. Open-ended questions were included to explore perceptions. The questionnaire was distributed to all nurses working within the long-term care facility, working directly with older persons in the wards. Descriptive and inferential analyses were carried out on quantitative data, while content analysis was used for the open-ended responses. Meta-inferences were done to integrate findings.

Results:
A total of 213 questionnaires were collected, representing a response rate of 60.86%. 72.8% of the participants were female, with a mode age group was 31–40 years (41.3%). The study found that nurses viewed robotic systems as beneficial, with mean scores of 2.39/5 for perceived usefulness (PU) and 2.53/5 for perceived ease of use (PEOU). Using regression analysis, PU, PEOU, and external factors significantly predicted BITU, with an R2 of 0.784 ($p<0.001$). Exploratory factor analysis showed that external factors have a negative impact on the different variables in the model (-0.165 with PU, -0.167 with PEOU, -0.222 with BITU).

Conclusions:
Nurses within the facility had positive perceptions toward the concept of integrating technology into their everyday lives. External factors have a negative influence on nurses' acceptance of robotic systems, which may hinder the implementation of such technologies.

Keywords: "Robotic systems", "Elderly care", "Technology acceptance", "Nursing", "Quantitative research".

Highlights:
- The findings of the study rejected the null hypothesis, indicating an acceptance among nurses to adopt robotic technology. This understanding relies on the PU and PEOU of these robotic systems, in addition to their ability to improve care delivery for older patients.
- Despite external factors raising concern, they did not significantly impede acceptance, indicating that any barriers to adopting care could be addressed through strategic management, pilot studies, and comprehensive training prior implementation.
- The study emphasized the necessity of strategically implementing these robotic systems to address particular issues and enhance user involvement.

Introduction

The shortage of healthcare professionals in the healthcare industry suggests that in the near future, there is a high probability that there may not be enough individuals to care for older persons (Tuisku et al., 2018). Such shortage is already felt in the nursing profession, where in the local setting, hospitals and homes for older people are under pressure and stress due to the decrease in graduate nurses and nurse recruitment over the past years (Calleja, 2024).

In response to these challenges, technological approaches can assist healthcare professionals and older persons in dealing with these shortages. Innovations such as robotic systems within long-term care (LTC) institutions can promote independence by helping older residents compensate for their physical deterioration (Łukasik et al., 2020). The attitudes of healthcare professionals towards the use of these innovative approaches in LTC facilities are an important factor that determines whether the robots are accepted and used (Tuisku et al., 2018). In countries such as the United Kingdom, Germany, Japan, and the United States, such innovations are being economically supported through constant research, and robots are already being used for different roles (Trainum et al., 2023). The roles of robotic systems include preparation and administration of treatment, mobility and exercise support, fall detection and monitoring of physical activity, lifting assistance, and helping in feeding and bathing of older persons (Wright, 2023).

The most valuable resource in a company is its human capital (Mullins, 2005). Thus, it is important to know the staff's opinion before introducing a new approach within the organization. In this case, the implementation of robotic systems to help nurses in the preparation of treatment, patient handling for lifting and transferring, and continuous monitoring of vital signs was considered. These systems were considered as they have already been tested locally in other settings.

It was anticipated that robotic systems could become integrated into local LTC facilities in future.

Aim and Objectives

This study aimed to investigate the acceptance of robotic systems among nurses at a LTC facility while identifying the perceived benefits of robotic systems in enhancing elderly nursing. The null hypothesis was that nurses at SVP would not accept the integration of robotic systems in care of the older person.

The objectives of the study were to:
a) To identify the perceived benefits, ease of use, and potential challenges of robotic systems in improving care of the older person practices.
b) To investigate the acceptance of robotic systems among nurses at SVP (old block).
c) To identify the ethical considerations related to using robotic systems.
d) To explore the concerns nurses may have regarding the integration of robotic systems in care of the older persons.

Methodology

A post-positivist perspective was used to investigate nurses' acceptance of robotic systems in a LTC facility. This approach emphasized objective measurement and statistical analysis (Keyter, 2016). A cross-sectional observational design was used.

Sample

The total population was 350 nurses, which included all nurses working with older persons in the LTC facility. Using a 95% confidence level and a 5% margin of error, the recommended sample size identified was 184 nurses to have a representative sample. All eligible nurses working with older persons at SVP (old block) were invited to participate in the study, ensuring an unbiased and representative sample of the target population (Nikolopoulou, 2023).

Recruitment and Data Collection

The total nursing population working within the institution was contacted for possible participation through an intermediary. The data collection process covered a three-week period between the end of January 2025 and mid-February 2025. After gaining ethical approval, a Nursing Officer working within the institution acted as the gatekeeper to the population by disseminating and collecting a hard copy of the questionnaire from nurses working in all wards of SVP (old block). These included nurses, charge nurses, and other nurse grades (such as practice nurses). The gatekeeper ensured the anonymity and confidentiality of the participants. Participants were provided with both the questionnaire and a participant information sheet outlining the purpose of the study, ensuring informed consent.

Pilot Study

A pilot study was conducted to test the questionnaire for its clarity, understandability, and time required to complete the questionnaire. The pilot study involved six nurses who were recruited through a sampling of convenience. The participants were timed to see how long it took them to finish the questionnaire. They were requested to provide feedback about any difficulties they encountered, and a conversation was held to ensure they understood all the questions.

Theoretical Framework

The Technology Acceptance Model (TAM), developed by Davis et al. (1989), was used to examine user acceptability of new technologies, especially in the healthcare setting. This model focuses on two main concepts: perceived usefulness (PU) and perceived ease of use (PEOU), making it ideal for investigating nurses' perceptions of how they perceive potential use of robotic systems in their work. PU referred to "the degree to which a user believes a technology would enhance job performance", while PEOU referred to "the degree to which a user believes using a technology would be effortless" (Aljarrah et al., 2016; Marikyan & Papagiannidis, 2023). According to TAM, if the technological invention is expected to be easy to use, it is more likely that it will be seen as useful by the user, and there is a higher chance that this will encourage the acceptance of the technology (Marikyan & Papagiannidis, 2023).

The TAM was selected as the framework for this study because of its strong theoretical foundation and extensive use in several other studies of technology acceptance (Rony et al., 2024). This model has been applied in various healthcare research studies to study the acceptance of technology by healthcare professionals since it was empirically tested many times (Franke et al., 2021). Figure 1 shows the Technology Acceptance Model.

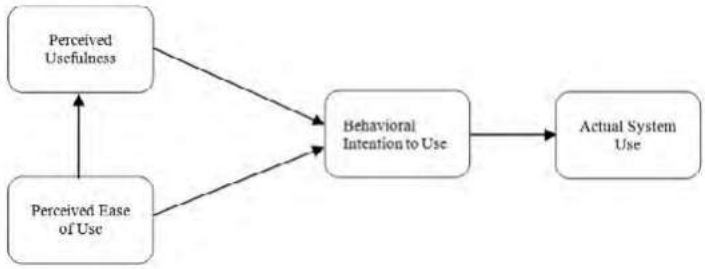

Figure 1: The Technology Acceptance Model (Naeini & Krishnam, 2012)

Research Tools

A self-administered questionnaire was used to collect data on the variables of this study, drawing on research that used the TAM. The questionnaire was designed to address PU, PEOU, behavioural intention to use (BITU), and external factors, such as ethical concerns, that can influence acceptance. The questionnaire was divided into three sections: the first section gathered demographic data - age, experience, and education. The next section presented three scenarios, each demonstrating a specific robotic system and its function in helping nurses with treatment preparation, monitoring vital signs, and patient handling. The scenarios were designed to help participants picture how robotic systems can assist them in their daily tasks, simplifying the process of providing informed responses. Every scenario contained twelve statements, resulting in a total of 36 statements in the second section of the questionnaire. A 5-point Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) was used to evaluate nurses' responses. The third section featured three open-ended questions designed to enable respondents to express their thoughts and views in their own terms.

Data Analysis

Data was analysed statistically and using content analysis. Descriptive analysis was used to summarize the data by calculating frequencies, percentages, means, and standard deviations. The Likert-scale responses were converted into numerical values and analysed statistically. The Shapiro-Wilk test and the Kolmogorov-Smirnov test were used to check the normal distribution of data. PU, PEOU, and BITU scores indicated that the data were not normally distributed; thus, non-parametric tests were used for inferential statistical analysis. In contrast, both tests for external factors presented that the differences between the observed data and a normal distribution were not statistically significant. This suggested that the normality assumption was valid for the external factors variable. As a result, parametric statistical tests, such as Pearson's correlation and one-way Analysis of Variance (ANOVA), were used for further analysis.

SPSS allowed the researcher to perform inferential statistics, using several tests, including the Kruskal-Wallis test and t-tests. These were used to examine the relationship between variables by manually inputting data into SPSS. The 5-point Likert scale responses from Section 2 of the questionnaire were converted into numerical values for statistical analysis in SPSS. A numeric value was given to each response as follows: Strongly Agree - 1, Agree - 2, Neutral - 3, Disagree - 4, Strongly Disagree - 5. Using these numerical values, the data were transformed into ordinal calculations, which allowed for means, medians, and standard deviations (SD) to assess nurses' acceptance.

Content analysis examined the open-ended responses from the questionnaire. The researcher categorized themes and patterns, highlighting key concerns and suggestions regarding the use of robotic systems in care of the older persons, guided by the TAM. Data integration was applied to link and compare the quantitative findings with the nurses' comments from the open-ended questions of the questionnaire.

Ethical Considerations

Ethical approval was obtained from the IDEA College Research Ethics Board, the Data Protection Office at SVP, and the Chief Executive Officer of SVP. Questionnaires were completed anonymously, with no personally identifiable information collected. The participant information sheet emphasized that participation was entirely voluntary, stating that participants were not obligated to participate and could withdraw at any time.

Results

Descriptive Analysis

A total of 350 questionnaires were distributed to nurses working in the old block of SVP, from which 213 (60.86%) responses were obtained. Mode participants were female (n=155, 72.8%), and the mode category of Age was 31-40 years (n=88, 41.3%). Table 1 presents descriptive data on the participants' gender, along with a crosstabulation of the number of participants grouped by age, occupation, and years of experience working with older adults. In terms of occupation, the largest group consisted of staff nurses (72.3%), with the majority being female nurses. Years of job experience working with older persons was another possible confounding variable that could have influenced how nurses perceived their perceptions about robotic technology. Most nurses have been working with older persons for 11 years or more (37%). The second largest group consisted of participants who had worked with older persons for 3 years or less (32%).

		GENDER					
		Male		Female		Total	
		Count	Percentage	Count	Percentage	Count	Percentage
AGE	20-30	16	22.9%	54	77.1%	70	100.0%
	31-40	26	29.5%	62	70.5%	88	100.0%
	41-50	5	17.2%	24	82.8%	29	100.0%
	51+	10	40.0%	15	60.0%	25	100.0%
OCCUPATION	Charge Nurse	13	37.1%	22	62.9%	35	100.0%
	Staff Nurse	43	27.9%	111	72.1 %	154	100.0%
	Other Nurse Grade	1	4.3%	22	95.7%	23	100.0%
YEARS OF EXPERIENCE WORKING WITH OLDER PERSONS	0-3 Years	13	19.1%	55	80.9%	68	100.0%
	4-6 Years	16	39.0%	25	61.0%	41	100.0%
	7-10 Years	7	29.2%	17	70.8%	24	100.0%
	11 + Years	21	26.6%	58	73.4%	79	100.0%

Table 1: Demographic characteristics of study participants

The majority of the questionnaire consisted of statements derived from the Technology Acceptance Model (TAM), focusing on perceived usefulness (PU), perceived ease of use (PEOU), behavioural intention to use (BITU), and external factors (primarily ethical implications) regarding the acceptance of robotic systems in care of the older persons. Participants were asked to respond using a 5-point Likert scale ranging from "strongly agree" to "strongly disagree." In addition, open-ended questions were included to allow participants to elaborate on these constructs, providing further insights into their perceptions and concerns.

Perceived Usefulness (PU)
A mean score of 2.39 suggested that nurses leaned toward agreeing that robotic systems are useful, although they did not strongly agree. The SD, which was 0.79, indicated some variation in responses. The youngest age group, 20-30 years, recorded the lowest mean PU score of 2.10 and a median of 2.00, indicating the highest PU of robotic technology. In contrast, participants from the 51+ age group displayed the highest mean PU score of 2.56 and a median of 2.50, highlighting a decrease in the PU of robotic systems.

Perceived Ease of Use (PEOU)
Results for PEOU indicated a mean score of 2.53 (SD=0.667), with a 95% CI for the mean ranging from 2.44 to 2.63. When analyzing PEOU across different age groups, participants in the youngest category (20-30 years) demonstrated the highest ease of use, with a mean value of 2.32, suggesting a positive reception towards the technology's usability. In contrast, the oldest age group (51+) showed more challenges, as seen by the highest mean score of 2.80.

Behavioural Intention to Use (BITU)
The descriptive statistics found a mean score of 2.53 and an SD of 0.761. The 95% CI for the mean, which ranged from 2.43 to 2.64, highlighted a consistent recognition of these benefits among the participants. The variability in responses was moderate, as reflected by the SD, with responses ranging from 'Strongly agree' to 'Strongly disagree.' This range indicated that, while participants favoured agreement, there were varying levels among nurses regarding the benefits of robotic systems. As shown in Table 2, nurses in the 20-30 years category showed the strongest agreement regarding the benefits of robotic systems, with a mean score of 2.30. This agreement slightly declined with age, as seen in the 31-40 group, with a mean score of 2.64. Moreover, nurses in the 41-50 and 51+ age groups maintained a similar level of agreement, with both groups showing a mean score of 2.67. This result showed the least agreement compared to the other age groups, suggesting increased skepticism and a decrease in BITU robotic systems as age increased.

External Factors
The mean score for external factors was 2.49 on a scale where one indicated strong agreement (negative perception) and five indicated strong disagreement (positive perception). The SD of 0.647 indicated moderate response variation, suggesting different perceptions among nurses regarding these external factors. The 95% CI for the mean score ranged from 2.40 to 2.57. This range reflected consistent perceptions among nurses while still accounting for some variability. As seen in Table 3, the mean scores ranged from a low of 2.38 for nurses in the 51+ age category to a high of 2.55 for nurses in the 41-50 age category. Additionally, the youngest nurses (20-30 years) and the oldest nurses (51+ years) had more negative perceptions, with mean scores of 2.47 and 2.38, respectively, compared to the middle-aged groups (mean scores: 2.50 and 2.55). This indicated a trend where younger nurses and older nurses might view external factors more unfavourably in the acceptance of robotic systems. The SD was mainly consistent, with the smallest variability found in the 41-50 age group (0.537) and the highest in the 20-30 age group (0.683). This showed that opinions within the 41-50 age category were more similar than in other age groups, whereas in the 20-30 age group, there was greater variation in views regarding external factors.

Regression Analysis
Regression analysis investigated the factors influencing nurses' BITU robotic systems. As presented in Table 2, the results indicated that both PU and PEOU are significant predictors of BITU. PU showed a positive relationship with BITU ($B=0.613$, $p<0.001$), suggesting that the more nurses perceive the system as useful, the more they are willing to use it. PEOU was positively correlated with BITU, as the 95% confidence interval ranged from 0.179 to 0.408 ($p<0.001$), indicating that a system that is easy to operate is essential for adopting innovative technologies. Conversely, external factors had a negative impact on BITU ($B=-0.130$, $p=0.002$). This result implied that nurses' concerns may hinder the acceptance of robotic systems. Furthermore, the analysis did not show significant effects based on gender, age, occupation, or years of experience working with older persons, suggesting that these factors did not influence nurses' BITU robotic systems.

	UNSTANDARDIZED COEFFICIENTS		STANDARDIZED COEFFICIENTS			95.0% CONFIDENCE INTERVAL FOR B	
	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
(CONSTANT)	0.712	0.214		3.330	0.001	0.290	1.134
GENDER	-0.017	0.059	-0.010	-0.291	0.772	-0.133	0.099
AGE	-0.031	0.037	-0.039	-0.848	0.398	-0.103	0.041
OCCUPATION	0.004	0.050	0.003	0.082	0.935	-0.095	0.103
YEARS OF EXPERIENCE WORKING WITH OLDER PERSONS	0.011	0.027	0.018	0.395	0.693	-0.042	0.063
PU TOTAL	0.613	0.051	0.637	12.025	<0.001	0.512	0.713
PEOU TOTAL	0.293	0.058	0.258	5.051	<0.001	0.179	0.408
EXTERNAL FACTORS	-0.130	0.041	-0.111	-3.155	0.002	-0.211	-0.049

a. Dependent variable: BITU Benefits

Table 2: Regression analysis for predictors of BITU

Exploratory Factor Analysis

The covariance matrix presented in the exploratory factor analysis showed that BITU had a significant positive covariance with PU and PEOU variables investigated in the study; 0.796 and 0.529, indicating that these factors are closely tied together toward the acceptance of robotic systems. On the other hand, the external factors with all other variables indicated negative covariances -0.165 with PU, -0.167 with PEOU, and -0.222 with BITU. This showed concerns about external factors influencing nurses' acceptance, with lower perceptions of PU, PEOU, and BITU robotic systems. The EFA is presented in Table 3.

	PERCEIVED USEFULNESS	PERCEIVED EASE OF USE	BEHAVIOURAL INTENTION TO USE	EXTERNAL FACTORS
PERCEIVED USEFULNESS	1.131	0.529	0.796	-0.165
PERCEIVED EASE OF USE	0.529	1.055	0.539	-0.167
BEHAVIOURAL INTENTION TO USE	0.796	0.539	1.112	-0.222
EXTERNAL FACTORS	-0.165	-0.167	-0.222	0.419

Table 3: Exploratory Factor Analysis

Content Analysis

In incorporating content analysis, the study aimed to enhance the understanding of the quantitative data, providing a clearer perspective on nurses' perceptions and experiences with robotic systems and helping to identify factors that influence their acceptance. This process allowed for qualitative insights to be directly compared with the quantitative results, enhancing the interpretation of statistical findings and offering a better perspective on the factors influencing nurses' acceptance of robotic systems.

Meta-Inference

Meta-inference was developed by integrating the statistical and content analysis results. Each variable (PU, PEOU, BITU, and external factors) was explored through statistical measures and subthemes gathered from the most frequent responses provided by nurses. This approach enabled the integration of the findings with subjective insights, emphasizing how nurses' comments were in agreement or in dissonance with the quantitative data observed. Three subthemes emerged from the replies to the open-ended questions concerning PU: (i) workload reduction and staffing issues, (ii) enhanced efficiency, and (iii) improved patient safety. This is shown in Table 4.

Variable	Subthemes	Nurses' comments	Quantitative data	Meta-inference
Perceived Usefulness	Workload reduction and staffing issues	"decreased workload and increased time for communicating with patients" "new technology definitely helps save time" "reduces time and staffing issues, preventing burnout in nurses"	PU mean: 2.39 PEOU: r=0.730 p<0.001 BITU: r=0.842 p<0.001 external factors: r=-0.298 p<0.001	The significant positive correlation between PU and BITU reinforced the qualitative opinions that technology can reduce workload and staffing issues. Moreover, the mean score for PU indicated that most nurses agreed that they would find robotic systems useful in their work, enhancing their readiness to adopt such technology.
	Enhanced efficiency	"high efficiency" "the efficiency this can bring to my work" "enhanced efficiency and improved performance"		
	Improved patient safety	"decrease in errors and increasing patient safety" "improving safety and minimizing human errors" "safety of frail residents would be enhanced"		
Perceived Ease of Use	Training sessions	"adequate training sessions, user manuals, and on-call support" "ongoing training sessions and workshops" "As long as proper training is given at the start, I would have no problem using it"	PEOU mean: 2.53 PU:	The mean score for PEOU reflected that nurses agree that the implemented robotic
	Easy to use and user-friendly	"a reliable system that is easy to use, user-friendly, and does not require advanced technical skills" "easy to implement and written instructions" "if a technology is easy to use and easy to learn, I will have no problem in using it	r=0.730 p<0.001 BITU: r=0.720 p<0.001 external factors: r=-0.196 p=0.004	systems should be user-friendly and easy to operate. This aligned with the nurses' comments, who frequently highlighted the importance of training and support. Moreover, values show PEOU significantly affects both PU and BITU robotic systems among nurses.
Behavioural Intension To Use	Motivation driven by a better healthcare system	"I would be motivated to switch if it offers clear benefits over my current one" "if the new system will be more effective and better patient outcome will be received, I will be more motivated" "Upgrading from outdated systems is motivation enough"	BITU mean: 2.53 PU: r=0.842 p<0.001 PEOU: r=0.720 p<0.001 external factors: r=-0.288 p<0.001	The comments aligned with the mean score, and the positive correlation with the other variables (PU and PEOU) reinforced the idea that, while nurses were generally open to robotic systems, their full acceptance into daily practice still depended on demonstrations of effectiveness on the healthcare system, the involvement of a pilot study before implementation, and benefits to the patient and nursing workflow.
	Pilot study before implementation	"if the pilot study is successful I agree to the new system" "I think I will start using it after a long pilot study that will not result in any mistakes"		
	Interested in learning new technology	"I would be interested to try new technology especially robotics monitoring falls" "interested to learn new technology and it will help to reduce the workload" "it would be interesting to see how they operate. I would be open to use it or introduce it to my ward"		
External Factors	Supportive management	"Supportive management that allows hands-on training sessions during work hours" "I expect a wide time frame for learning and supportive management that accepts feedback of nurses" "I do not think there will be any support from the management"	External factors mean: 2.49 PU: r=-0.298 p<0.001 PEOU: r=-0.196 p=0.004 BITU: r=-0.288 p<0.001	Combining the feedback with the statistical quantitative data highlighted issues related to management support, ethical considerations, and the importance of nurse-patient communication. The correlation analysis showed significant negative relationships with all the other variables (PU, PEOU, and BITU). These values continued to suggest that external factors may impede the acceptance and implementation of robotic systems in nursing care.
	Ethical implications	"I expect assurance that mistakes from robots would not result in penalties for nurses" "it is important to address privacy, data security and user consent when adopting such technologies" "acceptance from patients, maintaining patients' dignity and trustworthy technology"		
	Replacing the nurse's job and human interaction	"assurance that it would not lead to role changes or losing our job to robots" "the new technology would not replace the human touch and I am afraid that relying on it will decrease the values of communication to the patients" "I feel skeptical because I fear they may replace human interaction in elderly care"		

Table 4: Relationship between nurses' comments and variables' statistics

Discussion

The study investigated the acceptance of robotic systems among nurses in a LTC facility, using the TAM as a framework. Through case scenarios, the research explored how PU, PEOU, BITU, and external factors influenced acceptance among nurses. The sample was representative of the broader nursing workforce, with a mode of female respondents, reflecting the global gender distribution in nursing. The diverse work experiences of the nurses added different perspectives to the study. Findings showed that nurses perceived robotic systems as useful and easy to use, with younger and less experienced nurses demonstrating greater openness to technology compared to older, more experienced nurses. This may have different attitudes and behaviours towards using robotic systems compared to experienced nurses (Joseph et al., 2019).

Regression analysis confirmed that PU and PEOU were strong predictors of BITU, while external factors, such as ethical concerns and fears of replacing human interaction, negatively influenced acceptance. These results highlight both the potential and the challenges of integrating robotic systems in care of the older persons.

Perceived Usefulness and Perceived Ease of Use

The mean PU score indicated that nurses generally agreed they would find robotic systems useful, although their agreement was not strong. Similarly, Leslie et al. (2021) reported a strong PU of robotics in nursing care, with a mean PU score of 13.2 out of 16 (82%). While nurses involved in this study agreed that robotic systems are useful, Sharkey and Sharkey (2012) highlighted several concerns that nurses have regarding the use of robots in care of the older persons. These concerns include reducing human contact, feelings of objectification, and loss of control, as well as issues related to privacy and personal freedom.

The mean score for PEOU suggested a positive reception towards the usability of the technology among participants, indicating that they generally found the robotic system easy to use, with limited variation in responses, suggesting consensus among the sample. Compared to Leslie et al. (2021), their study also found a mean PEOU score of 12.2 out of 16 (76%). Such figures highlighted a significant level of acceptance among nurses, reflecting the positive reception of usability observed in the current study. Furthermore, Madi et al. (2024) supported these outcomes, with 75% of respondents perceiving robotic systems as useful in nursing practice, suggesting the widespread advantages these technologies offer to healthcare settings.

These findings implied that nurses' high PU and PEOU of robotics in nursing care would positively influence their behavioural intention toward accepting robotics in nursing. This might be because robots possess the potential to operate continuously throughout the day and respond promptly to assigned tasks. Additionally, the adoption of robotic systems will eventually alleviate the physical burden on nurses attributed to non-clinical tasks, allowing them to focus on their primary clinical duties (Coco et al., 2018).

Results Across the Three Case Scenarios

Using Spearman's rank correlation coefficient, findings showed statistically significant positive correlations across all scenarios. This consistency across different contexts confirmed that nurses' PU of robotic systems is stable, regardless of the situations presented in the scenarios. This finding was significant because it suggested that the attitudes measured are likely generalized across various practices in care of the older persons, reinforcing the potential for increased acceptance of such robotic systems. PEOU demonstrated uniformity across various scenario contexts, indicating that the case scenarios were effectively designed, thereby making the robotic systems understandable across different clinical settings. These findings were consistent with those of Leslie et al. (2021), who reported high PEOU among participants. This viewpoint affected their BITU robotic systems in care of the older persons. The correlation emphasized the potential for robotic systems to function continuously and efficiently tackle nursing tasks, thereby reducing the workload on nurses and enabling them to concentrate on their main clinical tasks.

Concerning age, the findings indicated that different age groups PEOU in diverse ways. Lukasik et al. (2020) observed that younger individuals were more adept at using new technologies compared to older nurses, reflecting a generational willingness to embrace technological advancements in healthcare. This trend matched the common belief that younger nurses would feel more at ease with technology and be more willing to adopt it because of the greater exposure to technological innovations from a young age. This was shown in the present study, where younger nurses exhibited a higher ease of use compared to older age groups.

The results indicated that the number of years nurses have worked with older adults can influence their PEOU of robotic systems. Nurses with experience tend to resist adopting new technologies due to the comfort of using traditional practices. As noted by Morris and Venkatesh (2000), younger nurses, often recent graduates who grew up in the era of computers, may have more experience making independent judgments about technology and may be less concerned about the opinions of those around them. Thus, they may be more open and adaptable to new technologies due to their recent exposure to modern educational advancements. Morris and Venkatesh (2000) also presented that older nurses may lack confidence in their ability to assess different aspects of technology. Therefore, they tend to seek the opinions of coworkers more heavily.

Behavioural Intention to Use (BITU):
The study suggested that nurses were willing to integrate robotic technology that they view as beneficial and manageable in their workflow. In contrast to Marikyan & Papagiannidis (2023), their study primarily focused on PU and PEOU, excluding BITU from their analyses. This may be because PU and PEOU are considered foundational constructs of the TAM and are thought to influence a user's decision to adopt technology. Therefore, these constructs are often prioritized in assessing initial acceptance and potential adoption. However, by incorporating BITU, one can explore whether users perceive technology as useful and easy to use and intend to integrate it into their daily work.

BITU, as highlighted in the TAM, considers not only the direct assessments of technology but also the user's attitudes toward change and innovation. Unlike PU and PEOU, which primarily focus on cognitive evaluations of technology, BITU is influenced by external environmental factors, personal experiences with technology, and potential impacts on patient care. This can lead to more variability in responses. For example, Leslie et al. (2022) highlighted that BITU robotic systems can be influenced by social influence, performance expectancy, trust, privacy concerns, and ethical issues.

According to Papadopoulos et al. (2018), the BITU robots by nursing managers were shaped by their views on innovation opportunities and the need to find new and cost-efficient ways to handle workloads. Moreover, the PU of robotic systems improved healthcare workers' positive attitudes and influenced their willingness to incorporate this technology into their practice. However, these intentions were negatively affected by concerns regarding ethics and privacy. For example, some nurses expressed concerns about potential privacy violations due to the release of user information. In line with these concerns, this research revealed considerable worries among nurses in Malta about the ethical implications and privacy issues linked to using robotic systems in care of the older persons. Nurses in Malta expressed fears that the adoption of this technology might lead to privacy breaches and possibly affect the quality of patient care.

Moreover, Coco et al. (2018) observed that culture can significantly influence nurses' BITU robotic systems. The study examined nurses in Finland and Japan, showing that Japan's previous engagement with robotics positively affected nurses' perception of robots assisting in care of the older persons. Coco et al. (2018) also pointed out that Japan is more advanced in its use of robotics in nursing compared to Finland. This is evident in the study's results, which showed that Japanese nurses exhibited a more positive attitude towards robotic systems compared to Finnish nurses. In Malta, robotic systems in healthcare are notably less developed than in Japan, which excels in this area. This variation in the extent of technological integration might lead to increased hesitation among Maltese nurses, similar to the reluctance seen in Finnish nurses in the study of Coco et al. (2018). These hesitations in Malta may arise from limited exposure to and understanding of the benefits of robotic systems in care of the older persons, as well as a lack of training and infrastructure to support such advanced technologies.

External Factors
The correlations noted among the three case scenarios indicated that nurses possess a common understanding of the external factors affecting the acceptance of robotic systems. There were significant worries that this technology could potentially increase rather than reduce the workload of nurses. Madi et al. (2024) shared this concern, expressing concerns that the workload of nurses would either stay the same or increase with the introduction of robotic systems. Additionally, nurses expressed worries regarding patient safety and the potential intimidation that patients could feel if robotic systems were present. These results differ from the study by Madi et al. (2024), which indicated that a substantial majority (84%) of nurses did not perceive robotic systems as a risk to patient safety.

This difference might arise from differing levels of familiarity with and confidence in robotic systems, which can influence perceptions on their safety and efficiency.

Nurses were concerned that patient dignity could be compromised and that supervisors' anticipated reliance on robotic systems might conflict with nurses' preferences for traditional care approaches. This concern was particularly noticeable among more experienced nurses, who favoured traditional practices rather than modern technologies. Such concern was demonstrated by Papadopoulos et al. (2018), who found that managers received robotic systems in care of the older persons with enthusiasm, whereas nurses did not accept the new process of these systems and preferred the current methods within their existing system. The research pointed out an important gap in acceptance levels between the managerial personnel and nurses who are directly engaged with patient care. This indicates that although managers might acknowledge the economic benefits and efficiency of these technologies, nurses were more concerned with how these changes affect patient care and their professional independence.

This study revealed concerns among nurses that robotic systems could undermine the nurse-patient relationship, which is essential for delivering effective patient care. However, Rony et al. (2024) provided opposing perspectives that presented a more optimistic view on the integration of robotic systems. They emphasized the evolving role of robotic systems in enhancing interactions between nurses and patients. They argued that these systems can serve as a supportive tool that enables nurses to dedicate additional time to patients, thereby enhancing the effectiveness of communication methods and offering more personalized care.

Nurses from the study of Madi et al. (2024) support the idea that effective integration of robotic systems can improve, rather than replace the elements of human care. However, as pointed out by Leslie et al. (2021), while these robotic systems might enable more time for patient interactions, it is still uncertain whether they will replace human nurses in healthcare settings. Indeed, Tuisku et al. (2018) expressed that older patients are not prepared for robots since they cannot replace the human touch, which offers comfort when needed. Moreover, this current study indicated an agreement on liability issues, reflecting the fear that robotic systems might lead to ethical and legal consequences. Similarly, Leslie et al. (2021) identified important elements affecting the adoption of robotics in nursing, such as data security and privacy, along with the reliability of robots.

Interrelation of Acceptance Factors

The negative correlations indicated that as the concerns associated with external factors increased, the PU, PEOU, and BITU correspondingly decreased. For example, if nurses believe that robotic systems could decrease their interaction with patients or increase their liability, their PU and PEOU will likely decrease (Coco et al., 2018). Moreover, suppose the implementation of robotic systems was seen as a potential threat to patient dignity or failed to reduce their workload. In that case, it can discourage nurses from wanting to use these robotic systems. Open-ended responses further emphasized the perceptions and concerns of nurses. These qualitative observations supported the numerical data collected from the questionnaire, offering a richer and more comprehensive understanding of nurses' acceptance of robotic systems in care of the older persons.

Comments by participants on external factors emphasized several key themes, such as the necessity for supportive management, ethical issues concerning the assurance that errors made by robots would not lead to penalties for nurses, privacy, data protection, user consent, and patient approval while ensuring patient dignity remains intact. Moreover, concerns regarding nurses being replaced by robots and a decrease in human interaction were also noted. These themes offered an understanding of the obstacles to the acceptance and implementation of innovative systems in care of the older persons, while highlighting the significance of organizational, ethical, and interpersonal factors that can affect nurses' willingness to adopt robotic systems.

Strengths and Limitations

Using a post-positivist approach benefited the study as it enabled a systematic and objective analysis of nurses' perceptions regarding the integration of robotic systems in care of the older persons, providing a framework to validate the hypothesis established at the beginning of the research. Another significant strength was the diversity of the sample. The participation of people in different roles helped understand how different groups of nurses may perceive and engage with robotic systems, providing a view of the factors influencing technology acceptance.

The combination of closed and open-ended questions improved the understanding of the nurses' acceptance of technologies. This approach enhanced the data and offered a more comprehensive perspective on nurses' subjective comments and experiences on the potential integration of robotic systems. Basing the analysis on the TAM provided a strong theoretical foundation for the study.

Although the questionnaire was developed carefully, it relied on self-reported data, which could have introduced biases, such as social desirability and response bias. Moreover, the tool had not been previously validated, and while internal reliability was tested during the study, the overall validity of the instrument remained a limitation. Due to the health worker effect, nurses who preferred not to participate may have had different perceptions than those who did, potentially changing the study's findings and limiting the applicability of the results to the entire population of nurses.

Conclusions

The study aimed to investigate the acceptance of robotic systems among nurses in a LTC facility, while identifying the perceived benefits of robotic systems in enhancing nursing care of the older persons.

Results showed that nurses perceive robotic systems as useful and user-friendly, supporting the potential integration of such technologies in care of the older persons. However, acceptance levels varied with concerns regarding ethics, patient privacy, robot reliability, job concerns, and replacing human interactions with robotic systems, suggesting that these issues should be addressed comprehensively for successful implementation.

This research contributed to the existing body of knowledge by providing empirical evidence on the factors influencing technology acceptance among nurses in a LTC setting. It underscores the importance of involving nursing staff in the decision-making process, offering targeted training programs, and developing clear policies to facilitate the adoption of robotic systems. This research opens paths for further studies to evaluate how to best integrate robotics in care of the older persons, and the impact on patient outcomes and nursing workflows.

Recommendations

Researchers should also use longitudinal designs to track changes in nurses' attitudes toward robotics as their experience increases, providing insights that cross-sectional studies may overlook.

Practically, training programs should prepare nurses to integrate advanced systems into routine practice, and technical support must be available around the clock, along with immediate error-reporting assistance.

Nurses emphasized the need for policies ensuring patient autonomy and quality care; incorporating these concerns into policy development will uphold ethical standards. Collaboration with the government and private sectors is also crucial for securing funding to implement such technologies in healthcare.

Authorship

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Dr Karl Spiteri: 25%
Mr Kurt Grixti: 15%

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05 Challenging the Obstacles in Pre-analytical Settings: Exploring frequency, types, and sources of preanalytical errors in blood sampling practice.

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Abstract

Objectives: Investigate the frequency, types, and sources of preanalytical errors (PAEs) in blood sampling practice within Clinical Chemistry and Haematology laboratories, and to develop evidence-based intervention for mitigating errors and enhancing patient safety and service quality.

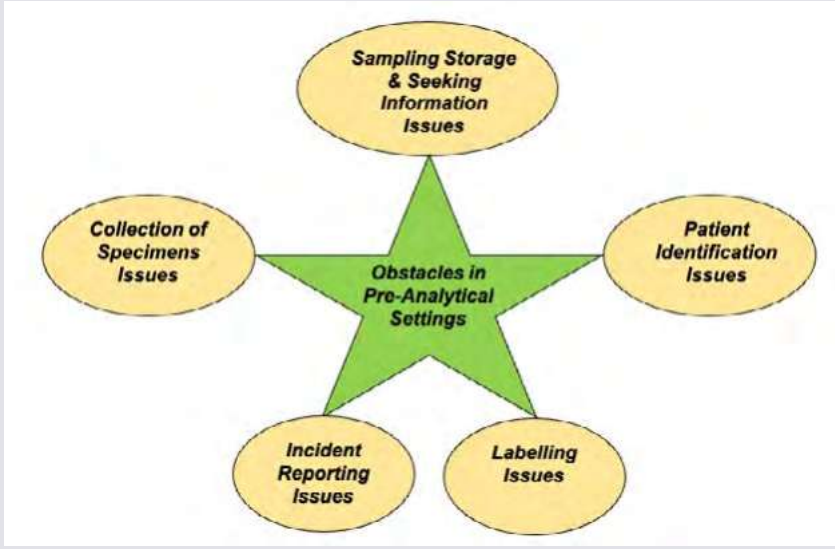
Methods: Administering a verified questionnaire to phlebotomists, nurses, and house officers at Mater Dei Hospital's phlebotomy and Emergency Departments (ED), Medical Wards and four health centres to assess blood sampling practices and integrating this information with data from the Laboratory information system (LIS) pertaining to Clinical Chemistry and Haematology Laboratory errors.

Results: The data survey revealed several weaknesses ranging from patient identification to sample storage. The integration of LIS and survey data assisted in revealing bottlenecks that generate the most common inaccuracies.

Conclusion: The preanalytical phase denotes the most vulnerable segment of the blood sampling testing process and is viewed as a significant challenge for laboratory professionals. PAEs are largely preventable by enhancing the educational framework for personnel, together with a comprehensive quality system that features regular discrepancies oversight. Standardising procedures, implementing a staff development and communication strategy, together with adopting new technologies, will contribute to mitigating PAEs.

Keywords:
"pre-analytical errors"; "patient safety"; "venous blood sampling"; "error mitigation".

Highlights:
- LIS data suggests that haemolysed, inadequate and clotted samples were prevalent PAEs.
- Medical Wards and Emergency Department were the main sources of errors.
- Numerous respondents did not precisely conform to established phlebotomy practices.



Graphical Abstract: Challenging the Obstacles in Pre-Analytical Settings

Abbreviations:

ACC	Anticoagulation clinic
ALP	Alkaline phosphatase
ALT	Alanine aminotransferase
AST	Aspartate aminotransferase
CK	Creatine kinase
CLSI	Clinical and Laboratory Standards Institute
ED	Emergency Departments
EDTA	Ethylenediaminetetraacetic acid
EFLM	European Federation Lab Medicine
EQA	External Quality Assessment
IFCC-WG	International Federation of Clinical Chemistry Working Group
LIS	Laboratory information system
PAE	Preanalytical errors
PT	Prothrombin time
SOP	Standard operating procedures
TTP	Total Testing Process
VBS	Venous blood sampling
VBSQ	Venous blood sampling questionnaire

Introduction

Healthcare laboratories have a critical responsibility in today's environment by delivering accurate information essential for therapeutic decisions. Precise laboratory findings are crucial for ensuring patient safety and enhancing the medical treatment of individuals. Multiple studies have shown that a significant majority, ranging from 60% to 70% of decisive choices regarding admission, discharge, and medicine rely on the findings of laboratory tests (Baron et al., 2012; Sonmez et al., 2020). Given the significant level of impact, ensuring the quality of laboratory testing and reporting is paramount. The primary objective of clinical governance is to provide high-quality patient care. This entails the responsibility of laboratories to provide services that benefit patient care (Wagar & Yuan, 2007).

Consequently, Clinical Chemistry and Haematology diagnoses are essential for clinical decision-making but are subject to human errors. Scientific advancements, including automation, standardisation, reagent optimisation, barcodes, and computerised test ordering have enhanced laboratory research, but errors continue to occur. Preanalytical phase mistakes in the Total Testing Process (TTP) exemplify this failure. Preanalytical errors may arise during patient preparation, order input, biological sample collection, transportation, and storage. Prior research and clinical observations suggest that most TTP mistakes transpire prior to sample analysis. Such errors often arise from human errors caused during phlebotomy operations. Therefore, emphasising the preanalytical phase of the TTP is critical to reduce these errors.

TTP is derived from the original brain-to-brain loop concept developed by George D. Lundberg in the early 1980s, but it adopts a more technical end-to-end approach. TTP delineates the complete life cycle of a laboratory test, encompassing patient preparation through to result reporting, and is extensively utilised in laboratory medicine. Figure 1 illustrates how TTP categorises the testing process into three distinct phases, namely the preanalytical, analytical, and postanalytical. Kaushik & Green (2014) argue that errors may arise during these three testing phases. However, the focus of this study is the preanalytical stage.

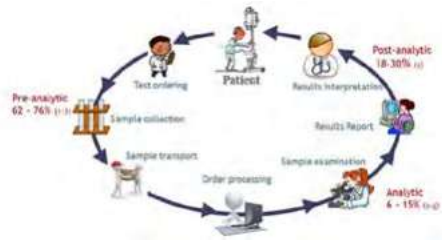


Figure 1: Total Testing Process
Source: Resetelli (2017). Extending the scope of EQA to the extra analytical phases, Figure 1, p.1.

According to Plebani (2012), the preanalytical stage encompasses the steps preceding analysis, which include test selection, patient preparation, specimen collection, handling, transportation, and processing. Despite significant advancements in analytical techniques, the preanalytical phase continues to lack standardisation and relies heavily on manual procedures. Carraro and Plebani (2007) contend that this lack of standardisation renders the process susceptible to errors that may jeopardise specimen quality and the integrity of results. Research demonstrates that the majority of errors in the total testing process arise during the preanalytical phase.

Bhat et al. (2012) and Cornes et al. (2016) identified that preanalytical errors comprised 31.6% to 84.5% of total errors, whereas analytical errors accounted for between 7% to 13%, and postanalytical errors for 18% to 47%. Preanalytical diagnostic errors occur due to issues with specimens, improper test requests, patient misidentification, and sample mishandling. Errors may result in negative consequences, including delayed or inaccurate diagnoses, inappropriate treatments, unnecessary testing, prolonged hospital stays, and potential harm to patients (Green, 2013). Managing preanalytical variables via quality improvement strategies that emphasise workflow automation, standardisation, and monitoring is essential for ensuring patient safety and the reliability of laboratory medicine (Simundic & Lippi, 2012).

The haematology and clinical chemistry laboratories are two of the most bustling departments in the clinical laboratory. Quality assurance is essential in both laboratories to provide reliable test findings with high accuracy for laboratory users (Stavelyn et al., 2017). Total quality management covers all specimen preparation steps, starting with the test order and concluding with the physician's interpretation of results. Its objective is to minimise or eliminate any possible mistakes that may arise throughout this process. Following the criteria for appropriate phlebotomy, sample transport, sample storage, and sample collection are essential to efficient laboratory operations and exemplary patient care (Kotasthane et al., 2019).

Patient outcomes can be significantly compromised by preanalytical errors; hence, the phlebotomist or other healthcare professional responsible for blood collection are the gatekeeper for patient safety. These errors have long been a persistent issue that affects the accuracy and reliability of laboratory samples (Simundic & Lippi, 2012). The healthcare institution and the patient incur substantial expenses because of this issue. Karcher and Lehman (2014) state that rejecting lab specimens might cause patient discomfort, difficulties recollecting the sample, delayed diagnosis, extended hospital stays, and significant jeopardy to patient safety. In their study, Karchar et al. (2014) found that the chemistry and haematology laboratories typically reject around one percent or less of all specimens submitted. However, the specimen rejection rate is usually higher for inpatients and emergency department patients compared to outpatients.

Preanalytical errors are high because of a high human intervention error that can occur due to various reasons, which include misidentification of the patient, wrong venipuncture, insufficient sample collection, clotted samples, haemolysed or diluted samples, wrong container, improper storage, and transport of sample (Plebani, 2012). Generally, the aim of the study is to investigate the frequency of preanalytical errors of the blood sampling process in clinical and haematology laboratories as well as the specific types and origins of these errors. This information will be used to develop an evidence-based intervention to decrease the prevalence of these errors and ultimately improve patient safety and the quality of the service provided.

Methodology

Research Population and Research Design of the Study

This research is grounded on a positivist research paradigm through a cross-sectional design because preanalytical errors in clinical environments are objective phenomena that can be quantified. The respondent's data was collected by administering a proven questionnaire on a census basis to phlebotomists, nurses, and house officers at Mater Dei Hospital's Phlebotomy and Emergency Departments, Medical Wards and four Health Centres, namely Paola, Mosta, Gzira, and Rabat, comprising of 220 participants. Acceptable ethical principles were applied, and approval to conduct the study was obtained from management.

The objective of the questionnaire was to assess blood sampling practices. The questionnaire data included several aspects, namely personal antecedents, awareness and knowledge of venous bloodletting, challenges in patient identification, sample collection and storage, online test ordering, and issues related to incident reporting. The number of valid responses received was 149, resulting in a margin of error of ±4.5%. According to Lobiondo-Wood and Haber (2022), a margin of error of between 5% to 7% is acceptable. Furthermore, a separate data set was extracted from the Laboratory information system (LIS) regarding laboratory errors for the period June 2023 to June 2024. The LIS data was categorised by error type and error location. These provided the integrating link between the LIS and the questionnaire data set. The preanalytical errors included errors associated with the Clinical Chemistry laboratory and the Haematology laboratory, mainly venous blood samples.

The collected data sets had the objective of addressing several research questions, with each research question having its own particular research design. The relevant research questions addressed by this article are the following:

1. What are the possible patient identification issues?

2. What are the possible patient blood collection sample issues?

3. What are the possible patient blood labelling issues?

4. What are the possible patient blood sampling storage issues?

5. What are the possible patient blood sampling incident reporting issues?

Instrument Validity and Reliability Assessment

This research did not employ constructs that measure concepts with specific dimensions, such as organisational commitment, which evaluates three dimensions. Consequently, the gathered data pertained to explicit informational factual enquiries presented as individual items. As stated previously, this study utilised a proven questionnaire developed by Bolenius et al. (2012) and Söderberg (2009). Bolenius et al. (2012) that validated the venous blood sampling questionnaire (VBSQ), developed with a clinical chemist and educators at Umea University's Clinical Chemistry Laboratory. International venous blood sampling (VBS) protocols were followed in this development (CLSI, 2007 and CLSI, 2017). In Swedish healthcare, the VBSQ was translated and tested for content, face validity, and reliability. The questionnaire was concise and clear to ensure completion in a reasonable timeframe. Furthermore, the VBSQ questionnaire applied various Likert scales contingent on the questions being asked. The applicable Likert scales ranged from No = 1 to Yes =3; Never = 1 to Always = 4; and Never = 1 to Every day = 5. Open-ended questions were applied for comments or suggestions, enabling respondents to express their opinions or recommendations concerning their practice. In the absence of literature standards, the legend for the findings presented in the tables and figures were defined by the authors.

The utilised questionnaire was created following a pilot study, in collaboration with experts in clinical chemistry and VBS, and through a review of pertinent literature. The questionnaire was reviewed on two occasions by a focus group comprising individuals experienced in VBS across various settings. Therefore, the content and face validity are considered reasonable (Söderberg, 2009). Söderberg (2009) asserts that the findings from his questionnaire revealed that laboratory staff reported better practices, demonstrating fewer errors in VBS compared to other staff categories, thereby suggesting a degree of validity. In terms of reliability, Söderberg (2009) contends that this pertains to the results' homogeneity (as determined by internal consistency testing) and reproducibility (as determined by test-retest). The findings of the questionnaire were confirmed to be reproducible through both a pilot study and a study conducted in hospitals. It can be concluded that the instrument employed in this study demonstrates both validity and reliability.

Results

This research produced comprehensive findings that are too voluminous to be presented fully. Hence, this article will mostly focus on the findings for the relevant research questions itemised previously.

Laboratory Information System (LIS) Error Types: Biochemistry and Haematology

The data for Table 1 and Table 2 was extracted from the LIS. The findings reveal that the Biochemistry errors constitute 4.6% of 373,705 blood samples, with haemolysis errors being the primary issue. On the other hand, the Haematology errors constitute 0.8% of 246,717 blood samples, with clotting and insufficient blood samples being the main concern. The Medical Wards and the Emergency Department appear to be the primary sources of errors.

				Health Centres					
Location	**Phlebotomy Unit**	**Medical Wards**	**Emergency Dept.**	**Paola**	**Gzira**	**Rabat**	**Mosta**	**Total Errors**	**% Errors**
Clotting	50	11	1	50	17	9	35	173	0.05%
Haemolysis	**1090**	**2057**	**12782**	**175**	**103**	**51**	**186**	**16444**	**4.40%**
Insufficient	45	181	62	17	10	3	8	326	0.09%
Sample Not Submitted	39	16	32	5	9	3	24	128	0.03%
Wrong Samples	88	40	50	17	4	3	21	223	0.06%
Test Already Requested	3	8	20	0	0	0	3	34	0.01%
Total Errors	**1315**	**2313**	**12947**	**264**	**143**	**69**	**277**	**17328**	**4.64%**
Sample Size	**107570**	**65095**	**106122**	**31457**	**19023**	**13647**	**30791**	**373705**	
% Errors	**1.2%**	**3.6%**	**12.2%**	**0.8%**	**0.8%**	**0.5%**	**0.9%**	**20.0%**	

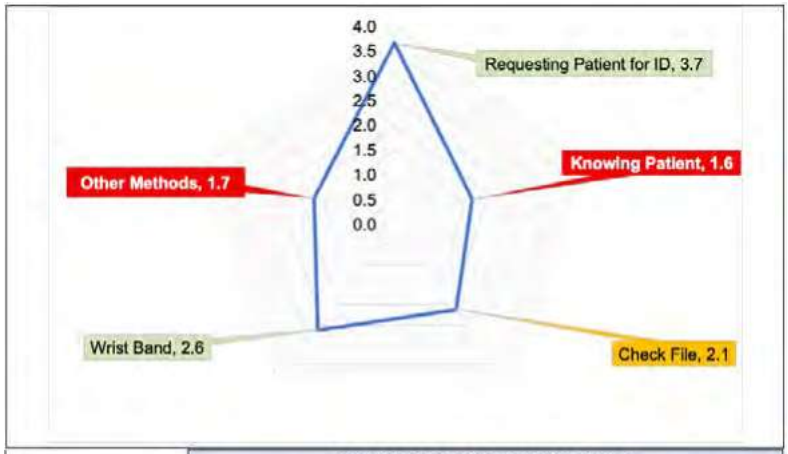
Table 1: Biochemistry Frequency of Error Types

				Health Centres					
Location	**Phlebotomy Unit**	**Medical Wards**	**Emergency Dept.**	**Paola**	**Gzira**	**Rabat**	**Mosta**	**Total Errors**	**% Errors**
Clotting	**135**	**434**	**576**	**73**	**43**	**15**	**52**	**1328**	**0.54%**
Haemolysis	0	0	0	0	0	0	0	0	0.00%
Insufficient	**149**	**231**	**131**	**32**	**13**	**7**	**22**	**585**	**0.24%**
Sample Not Submitted	0	0	0	0	0	0	0	0	0.00%
Wrong Samples	0	0	0	0	0	0	0	0	0.00%
Test Already Requested	0	0	0	0	0	0	0	0	0.00%
Total Errors	**284**	**665**	**707**	**105**	**56**	**22**	**74**	**1913**	**0.78%**
Sample Size	**56228**	**55406**	**85155**	**16218**	**10606**	**6872**	**16232**	**246717**	
% Errors	**0.5%**	**1.2%**	**0.8%**	**0.6%**	**0.5%**	**0.3%**	**0.5%**	**4.5%**	

Table 2: Haematology Frequency of Error Types

Possible Patient Identification Issues

The findings at Figure 2 suggest that there are no significant possible patient identification issues regarding two aspects, namely requesting the patient's ID and using a wristband. However, there is a serious issue with identifying a patient through directly knowing the patient; checking the file; and other alternative methods, which may not adhere to preferable practice.



Findings	Possible Patient Identification Issues				
	Requesting Patient for ID	Knowing Patient	Check File	Wrist Band	Other Methods
Mean Value	3.7	1.6	2.1	2.6	1.7
Standard Deviation	0.684	0.887	1.108	1.285	1.026
Legend:	Definitely an Issue: 1 to 1.75	Likely an Issue: >1.75 to 2.5	Unlikely an Issue: >2.5 to 3.25	Definitely Not an Issue: >3.25	

Figure 2: Mean Common Patient Identification Method

Possible Patient Blood Collection Sample Issues

The findings at Table 3 suggest that are seven factors that imply no significant Patient Blood Collection Sample Issues (highlighted in green and yellow). However, all the other factors denote a significant possibility of being an issue, particularly the lack of using an automatic test tube inverter (highlighted in red). Additionally, the factors highlighted in orange also indicate a likely issue.

Possible Patient Blood Labelling Issues

The findings at Figure 3 illustrate the common blood test tube label checking tasks. The only likely issue regarding these tasks is related to having someone else filling the patient's blood sampling request. Furthermore, Table 4 provides a more detailed analysis regarding the Patient Blood Labelling Issues. Table 4 reveals five serious issues (highlighted in red), which are all related to the timing and place of labelling the blood sample test tube.

Possible Patient Blood Sampling Storage Issues

Figure 4 provides the typical methods used by the respondents for storing test tubes immediately after taking the blood sample. It illustrates that there are several serious issues with the patient blood sampling storage methods. Furthermore, Table 5 shows the detailed findings regarding the blood sampling storage aspect. The findings at Table 5 suggest that out of ten possible factors, only two factors are not considered as likely issues. These two factors indicate that respondents do not need to refer to a colleague for assistance or seeking advice from the laboratory. However, the other eight factors are considered as a critical concern. These critical concerns include the respondents' reluctance to check sampling instructions online available on the MDH portal and initially placing the blood sample test tube in the workwear pocket or keeping them in the fridge without centrifugation.

Possible Patient Blood Sampling Incident Reporting Issues

Figure 5 demonstrates that respondents are very reluctant to file a patient blood sampling incident report for several reasons. The detailed findings suggest that there are serious issues about every factor being measured, namely not enough time; makes no difference; and nobody does. These represent the predominant reasons for not filing an error incident report. Hence, there appears to be a general apathy towards this aspect.

Possible Patient Blood Collection Sample Issues			
Findings	**Mean**	**Std. Deviation**	**Remarks**
When to remove tourniquet when performing venous blood sampling:			
• Before the first sample is drawn	1.4	0.793	Likely issue
• During sampling	2.1	1.107	Likely an issue
• When the sampling is finished	3.1	1.130	Unlikely an issue
• If there is difficulty collecting sample keep stasis as long as necessary	2.5	1.088	Likely an issue
• Keep the tourniquet for less than a minute	2.8	1.087	Unlikely an issue
***Abiding by the order of draw while bloodletting**	1.8	0.363	Abide preferred
***Perform bleeding from a newly fitted cannula**	1.4	0.486	Not preferred
Resting patient prior to sampling	2.5	1.687	Min 15 or 20min
Conducting Test Tube Inverter Tasks			
• Invert test tube several times immediately before the next one is filled	2.7	1.205	Unlikely an issue
• Use an automatic test tube inverter	1.1	0.497	Definite issue
Equipment used to withdraw blood	2.0	0.242	Winged set preferred
Disinfecting puncture site before performing bloodletting			
• *Before bloodletting rub puncture site in a circular motion for 30 seconds	1.9	0.285	Preferred
• *Leave the alcohol to dry before collecting the blood sample	1.8	0.414	Preferred
***Make an attempt to take blood from another site if blood flow stops**	2.0	0.181	Not an issue
***If blood sample is insufficient, do you check with the laboratory**	1.3	0.464	Likely issue

Legend: *No/Yes options	**Definitely an Issue: 1 to 1.25**	**Likely an Issue: >1.25 to 1.50**	**Unlikely an Issue: >1.50 to 1.75**	**Definitely Not an Issue: >1.75**
Legend: All Other Options	**Definitely an Issue: 1 to 1.75**	**Likely an Issue: >1.75 to 2.50**	**Unlikely an Issue: >2.50 to 3.25**	**Definitely Not an Issue: >3.25**

Table 3: Mean Common Specimen Collection Method

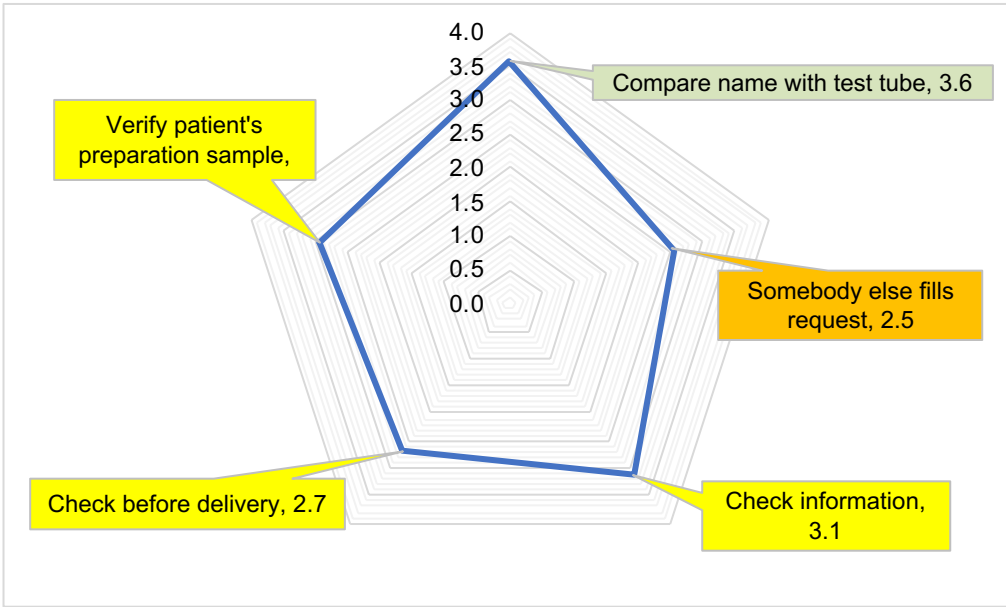


Figure 3: Mean Common Label Checking Tasks

Possible Patient Blood Labelling Issues			
Findings	**Mean**	**Std. Deviation**	**Remarks**
Label Checking tasks:			
• Compare patient's name & ID No with information on test request	3.6	0.699	Not an issue
• Use test requests that somebody else has filled in	2.5	1.094	Likely issue
• Check information on test request if somebody else has completed it	3.1	1.057	Unlikely an issue
• Check that test request & test-tube ID (barcode) match	2.7	1.108	Unlikely an issue
• Verify patient's preparation for sample requirements before drawing blood	2.9	1.175	Unlikely an issue
Frequency someone else prints sampling label for you	2.5	1.422	Likely issue
Printing the time of sample label if you do it yourself	2.6	0.839	Unlikely an issue
When or where do you label the test tube			
• Before patient is approached	1.2	0.605	Definite issue
• Alongside the patient before sampling	1.3	0.792	Definite issue
• Alongside the patient after sampling	3.3	0.958	Not an issue
• At a later occasion	1.4	0.724	Definite issue
• Somebody else has labelled the test tube in advance	1.4	0.719	Definite issue
• Somebody else labels the test tube after sampling	1.7	0.836	Definite issue
• First check sample type required as indicated on label prior to labelling	3.2	1.115	Unlikely an issue
Legend:	**Definitely an Issue: 1 to 1.75**	**Likely an Issue: >1.75 to 2.50**	**Unlikely an Issue: >2.50 to 3.25**	**Definitely Not an Issue: >3.25**

Table 4: Mean Common Patient Blood Labelling Issues

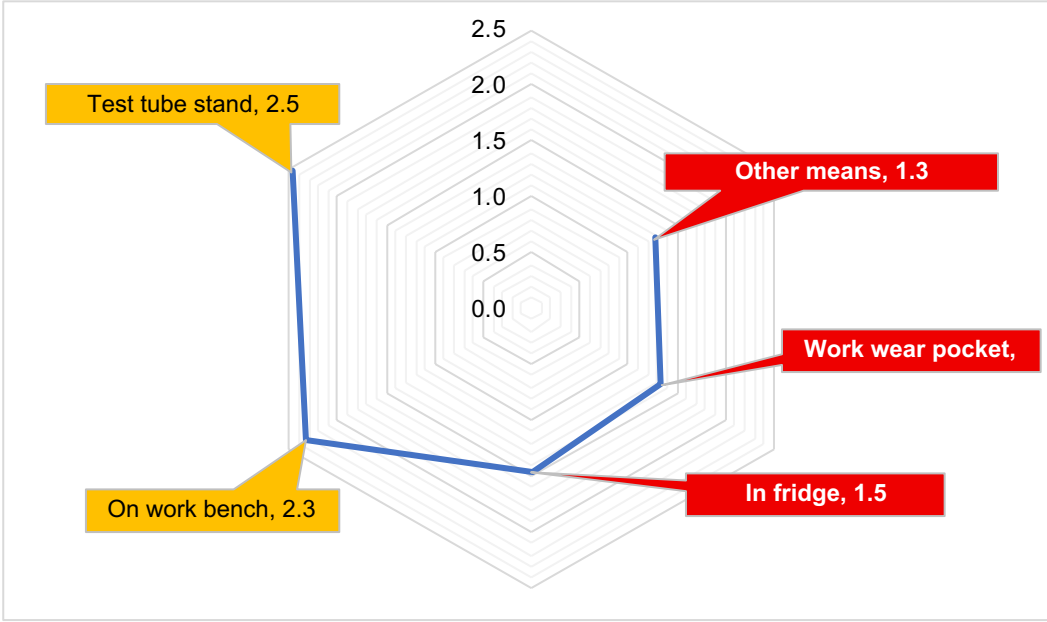


Figure 4: Mean Common Method of Storing Test Tubes Immediately After Sampling

Possible Patient Blood Sampling Storage Issues				
Findings		**Mean**	**Std. Deviation**	**Remarks**
What is done when not sure how a sample should be collected:				
• Check printed sampling instructions issued by the lab available in the unit		2.4	1.253	Likely an issue
• Check sampling instructions online available on MDH portal		1.7	1.016	Definite issue
• Ask a colleague		2.7	0.878	Unlikely an issue
• Contact the laboratory		2.7	1.023	Unlikely an issue
• By other means		1.3	0.674	Definite issue
How test tubes are stored immediately after blood sampling				
• Lying on a workbench or other similar location		2.3	1.083	Likely issue
• In the pocket of my work wear		1.3	0.622	Definite issue
• In a test tube stand		2.5	1.348	Likely issue
• I keep them in the fridge		1.5	0.834	Definite issue
• By other means		1.3	0.676	Definite issue
Legend:	**Definitely an Issue: 1 to 1.75**	**Likely an Issue: >1.75 to 2.50**	**Unlikely an Issue: >2.50 to 3.25**	**Definitely Not an Issue: >3.25**

Table 5: Mean Common Patient Blood Sampling Storage Issues

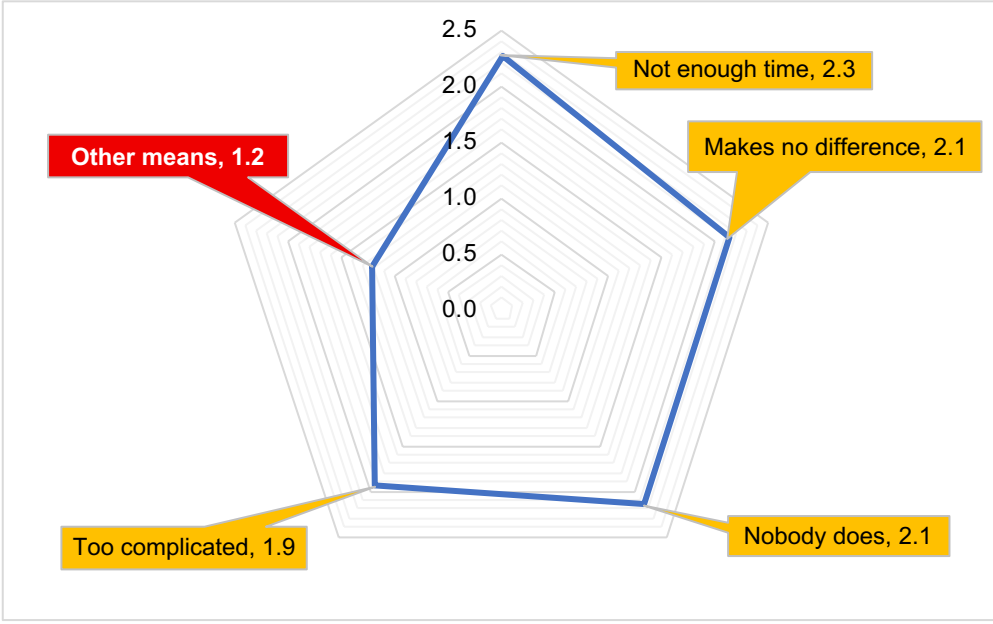


Figure 5: Mean Regarding Reasons for Refraining to Incident Error Report

Possible Patient Blood Sampling Incident Reporting				
Findings		**Mean**	**Std. Deviation**	**Remarks**
Frequency of venous blood sampling error incident reports		**0.4**	**0.897**	Definite issue
Reasons for not filing venous blood sampling error incident reports				
• Do not have enough time		2.3	1.303	Likely issue
• It would not make any difference		2.1	1.252	Likely issue
• Nobody else does		2.1	1.232	Likely issue
• It is too complicated		1.9	1.155	Likely issue
• By other reasons		**1.2**	**0.659**	Definite issue
Attitude towards venous blood sampling and specimen handling				
• Enough knowledge regarding venous blood sampling & specimen handling		2.5	0.576	Likely issue
• Proper collection & handling of blood samples is considered a priority		2.5	0.620	Likely issue
Legend:	**Definitely an issue: 1 to 1.75**	**Likely an issue: >1.75 to 2.50**	**Unlikely an issue: >2.50 to 3.25**	**Definitely Not an Issue: >3.25**

Table 6: Mean Regarding Reasons for Refraining to Incident Error Report

Discussion

Biochemistry and Haematology Error Types

As detailed in Table 1 and Table 2, haemolysis emerged as the most frequent preanalytical error in Clinical Chemistry, affecting 4.40% of the 373,705 blood samples collected from the Emergency Department; Medical Wards; Phlebotomy Unit; and Health Centres in Paola, Rabat, Mosta, and Gzira. Insufficient sample volume was the second most common error (0.9%), followed by wrong sample (0.06%); clotted sample (0.05%); sample not submitted (0.03%); and duplicate test request (0.01%). The Emergency Department (12.2%) and Medical Wards (3.6%) were the primary sources of these errors. In contrast, the overall error rate in the Haematology laboratory was considerably lower at 0.54% and 0.24% of 246,717 samples, with clotting and insufficient volume again being the most prevalent issues, particularly from the Medical Wards (1.2%) and the ED (0.8%).

When compared with prior research, such as that by Addis et al. (2016), who found insufficient samples (2.8%) and haemolysis (1.04%) among 1,533 specimens, the present study reveals a lower incidence of insufficient and clotted samples but a higher prevalence of haemolysis. Similarly, Jacobs et al. (2011) analysed 32,910 samples and identified clotted (44%) and insufficient (21%) samples as primary issues, particularly in Haematology. In Clinical Chemistry, inadequate volume (31%) and labelling errors (23%) were most frequent. Notably, haemolysed samples were often analysed regardless, except when potassium and a few other parameters were affected, thus highlighting inconsistencies in rejection practices, as also observed by Iqbal et al. (2023).

Studies by Narang et al. (2016), Cakira (2018), and Tasneem et al. (2024) have linked clotted samples in Haematology to poor mixing; delayed transfer of blood; underfilling ethylenediaminetetraacetic acid (EDTA) tubes; and prolonged storage. Such errors distort cell morphology and coagulation parameters, rendering the sample unsuitable for plasma or whole blood testing. Clinical and Laboratory Standards Institute (CLSI) guidelines recommends gentle mixing of vacutainer tubes to prevent such outcomes. Insufficient sample volumes in this study were primarily attributed to high workloads and clinician fatigue, particularly in the Emergency Department, compromising collection quality. For example, EDTA tubes, if under- or overfilled, distort red cell indices, cause pseudo-thrombocytopenia, pseudo-polycythaemia or false leukopenia, and produce spurious haematological readings (De la Salle, 2019). Goswami et al. (2010) further reported prolonged prothrombin time (PT) in underfilled coagulation tubes. In the present study, the Emergency Department had the highest incidence of both clotted and insufficient samples.

Haemolysis was another dominant error, reported in 4.40% of Clinical Chemistry samples. Prior studies documented Emergency Department haemolysis rates as high as 53%, 24%, and 21%, often linked to untrained phlebotomists (Lippi et al., 2011; Zaini et al., 2016; Alcantara et al., 2022). Gaikwad and Selkar (2021) similarly found haemolysis (3.1%) to be the most common PAE, emphasizing its onset during venipuncture and continued effect into the analytical phase. Multiple factors contribute to haemolysis, including inadequate drying of alcohol before puncture, underfilling of EDTA tubes, prolonged tourniquet application, vigorous mixing, use of small-gauge needles, excessive suction, and difficult venous access (Lippi et al., 2008; Phelan et al., 2018). Visually identifying haemolysis using a haemolytic chart or red tinge post-centrifugation remains standard, yet controversial, particularly in borderline cases.

Haemolysis may cause falsely elevated values of aspartate aminotransferase (AST), alanine aminotransferase (ALT), creatine kinase (CK) and depressed levels of alkaline phosphatase (ALP), glucose, and sodium (Najat, 2017). Despite its clinical impact, decisions on whether to reject or report haemolysed samples remain inconsistent. Some laboratories modify reported values statistically, introducing bias (Simundic et al., 2012). Recollection may be unfeasible due to patient condition or logistical constraints, increasing cost and turnaround time (van Azman et al., 2019). Therefore, in vitro haemolysis prevention and stronger interdisciplinary communication between laboratory personnel and clinicians are paramount. Distinguishing in vivo from in vitro haemolysis based on patient condition remains a laboratory responsibility and requires sound judgement.

Patient Preparation Prior to Venous Blood Sampling (VBS): Patient Identification Issues

The findings revealed that while 75.8% of respondents consistently utilised patient demographics for identification, 18% admitted to often omitting this step, relying on familiarity. This practice is unacceptable, as it may result in sample misidentification or demographic mismatches, potentially endangering patient safety (Valenstein et al., 2006; Da Rin, 2010). Although 41.6% of respondents consistently checked wristbands, 20.1% reported rarely doing so, and 28.9% never checked them at all. The lack of wristband verification was often noted among staff in anticoagulation clinic (ACC) and health centres. Studies suggest technological solutions, such as photo ID systems and barcode scanners, enhance patient safety (Lau et al., 2000; Naz et al., 2012; Soderberg, 2009; Heath et al., 2023).

Encouragingly, 98.7% disinfected the puncture site, and 90% did so for the recommended 30 seconds, with 77% allowing alcohol to dry. The winged set was preferred by 94% of participants due to its safety and efficacy, particularly for patients with challenging venous access (Lew, 2012). However, 53% of participants only removed the tourniquet after completing sampling, contrary to European Federation Lab Medicine (EFLM) and CLSI recommendations, which advise removal once blood flow is established (Lima-Oliviera et al., 2015; Neogi et al., 2016; EFLM, 2023). Only 36% reported not exceeding the one-minute limit, with 13.4% confirming overuse. Prolonged tourniquet application can lead to haemoconcentration which can falsely elevate levels of analytes such as potassium, calcium and proteins. Some participants also indicated maintaining tourniquet pressure during challenging collections, a practice associated with increased haemolysis risk (Simundic et al., 2015).

Venous Blood Sampling Technique: Patient Blood Collection Sample Issues

Order of draw is crucial to prevent additive cross-contamination. Although 84% claimed to follow the correct order, the most common sequence, blue/yellow/purple/red/grey/green, was incorrect. Incorrect sequencing, such as placing EDTA tubes before serum tubes, risks critical analytical interference, particularly with potassium, iron and biochemistry testing (CLSI, 2017; EFLM, 2023). Only 36% of participants consistently inverted tubes post-collection; 25% never did. Moreover, 91.9% had never used an automated tube inverter, likely due to its unavailability. Although some argue that standard vacuum pressure during VBS reduces the need for manual inversion (Lima-Oliviera et al., 2015), current EFLM guidelines still recommend gentle mixing to maintain sample integrity (Simundic et al., 2015). A significant communication gap was identified in that 69% of respondents never consulted the lab when samples were inadequate, and only 24.8% did so during phlebotomy difficulties. Improved collaboration between healthcare professionals and laboratory staff can reduce recollections and improve diagnostic turnaround (Naz et al., 2012).

Patient Blood Labelling Issues

The findings revealed that 69% of participants cross-verified patient demographics with request forms, which is viewed as a necessary step to avoid preanalytical labelling errors (Lippi & Plebani, 2017). However, only 34% compared barcode labels between tubes and forms. Additionally, 22% of respondents admitted to using forms prepared by others, increasing the risk of data entry errors (Plebani, 2015). Only 12% of respondents consistently printed the sample time on the tube (either more or less than 30 minutes from the VBS time), which is a vital detail for time-sensitive tests, such as cortisol or cardiac markers (Harverstick & Groszbach, 2014). Moreover, 36% of respondents allowed others to label tubes, and 41% labelled them after collection without the patient present, contrary to best practices (Nikolac et al., 2013). Labelling in the patient's presence is critical to avoid specimen mix-ups.

Patient Blood Sampling Storage Issues

Proper storage of blood samples is essential for maintaining specimen integrity. CLSI (2017) guidelines recommend upright storage in test tube racks or refrigeration at 4°C to 8°C preferably centrifuged if immediate transport to the laboratory is not feasible. However, only 37% of respondents adhered to this standard by using test tube stands, and just 4.7% of respondents refrigerated specimens. Alarmingly, a significant proportion of respondents left samples on benches, while 25% of respondents reported sometimes or often carrying them in lab coat pockets. These practices risk contamination, breakage, and delayed submission.

Incident Reporting Issues

Incident reporting was notably infrequent, with 80.5% of respondents stating they had never filed an incident report. Barriers included time constraints (29%), perceived complexity (17%), and lack of initiative (22.8%). This underreporting suggests that many preanalytical errors remain undocumented, undermining opportunities for quality improvement. Soderberg (2009) similarly found low rates of incident reporting among phlebotomy staff in public healthcare facilities. Given the Institute of Medicine's (2000) call for error reporting as a mechanism to enhance patient safety, fostering a culture of accountability and simplification of reporting processes may be necessary. While over half of respondents (61%) believed their unit prioritised venous blood sampling, and 57% felt adequately trained. The findings indicate significant room for improvement through targeted education and routine audits.

Conclusions

Table 6 provides a summary of study conclusions and limitations. The preanalytical phase represents the most susceptible segment of the entire testing process and is regarded as one of the significant challenges faced by laboratory professionals. To enhance the Clinical Chemistry and Haematology laboratory services, it is essential to conduct an objective evaluation of processes, methods, personnel, and organisations against established and reliable standards to detect and proceed with necessary changes. In both laboratories, the majority of PAEs can be prevented. Improving the educational framework for phlebotomy and clinical personnel, along with the establishment of a comprehensive quality system that features consistent oversight of discrepancies, can significantly minimise errors (Kaushik, 2014 & Plebani, 2017).

GENERAL CONCLUSIONS
Patient Identification Practices
Practices like wristband verification support do not pose an issue. However, informal identification methods (e.g., knowing the patient) and lack of consistent file checking and validation are a concern. These findings demand enhanced training and stricter adherence to formal identification procedures.
Blood Collection Sample Issues
While standard practices are evident, critical lapses in tourniquet management, patient preparation, and sample handling and validation are an issue. Comprehensive training and better procedural adherence are necessary.
Labelling Issues
Although some practices are consistent with best practices, the frequency of risky behaviours such as delegated or delayed labelling clearly suggest a risk. Procedural reforms and accountability are essential.
Sample Storage Practices
Sample storage protocols are inadequately followed. The findings indicate a serious concern and reinforce the need for storage-specific guidelines, staff training, and stricter monitoring.
Incident Reporting Practices
There is a systemic failure in incident reporting. This requires immediate attention via education, simplification of reporting systems, and reinforcement of a safety culture.
STUDY LIMITATION
A larger population including surgical wards, all health centres and clinics would likely yield enhanced outcomes.
This research only highlights pre-analytical errors noticed by laboratory workers and documented in the LIS. The extent of undiscovered or unrecorded pre-analytical errors remains unknown.

Table 6: Summary of Study Conclusions and Limitations

Continuous local research efforts that track the frequency of errors and assess the risks associated with pre-analytical practice issues, along with immediate input, debates, and observations among involved staff, seem to represent the most effective strategy for maintaining optimal practices. Improving the pre-analytical phase hinges on standardising VBS procedures, providing knowledge and re-educating, clearly defining responsibilities, fostering effective communication with phlebotomy staff, and embracing advancements in new technologies and automation. However, these initiatives necessitate continuous funding and oversight (Zemlin, 2018). It is essential to promote continuous professional growth and additional VBS training for bloodletting professionals and phlebotomy support staff (Lippi et al., 2018). While it is possible to improve the measurable elements of laboratory services, the process remains incomplete without ongoing input from the users of these services. The research findings suggest the following practical recommendations:

• Develop clear standard operating procedures (SOP's) that specifically outline the preanalytical phase.

• Implement quality indicators developed by the International Federation of Clinical Chemistry Working Group (IFCC-WG) to monitor and improve the quality of preanalytical processes in laboratory medicine.

• Need for additional and continuous training, competent evaluation, and auditing of bloodletting procedures.

• Better communication between healthcare professionals and laboratory staff.

• Additional staff, particularly in units with high need for bloodletting.

• Continuous updating on new procedures or sample requirements,

• Automate processes through various systems, such as transportation monitoring; electronic ordering in all health centre facilities; barcode scanning and wristband/photo identification. Also introduce smart trollies; automatic test tube invertors; and vein illumination devices.

• Consideration may be given on enhancing the laboratory manual by incorporating practical examples of guidelines that currently are not official.

• Basic preanalytical education may be offered to last-year nursing, clinical, and phlebotomist students, and their abilities and knowledge can be assessed by reported practices.

It is suggested that future research explore a hybrid methodology that incorporates direct observational studies and structured interviews, as this could yield a more comprehensive understanding of significant elements of the preanalytical phase that a purely quantitative approach may overlook. Future studies may also focus on the effects of horizontal test tube storage, the correct order of draw, and the various preservatives contained in each vacutainer. Finally, the study outputs will be very advantageous to solidify the execution of results and facilitate the transmission of findings to other healthcare departments.

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Conflict of Interest

The corresponding author is employed at the Pathology Department, Mater Dei Hospital, Malta.

Authorship

The percentage of each author's contribution to the manuscript:

Ms Graziella Santillo – 50%
Dr Emanuel Camilleri – 50%

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06 Validating HOSPITAL score for 30-day readmission and mortality in older adults discharged to long-term care

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Abstract

Background: Unplanned 30-day hospital readmissions and 30-day mortality are key performance indicators among older adults discharged from hospital to long-term care (LTC). Validating predictive tools in this setting is important to guide transitional-care interventions.

Objectives: To evaluate the HOSPITAL score reliably in predicting 30-day readmission and 30-day post-discharge mortality in older adults discharged to LTC in Malta.

Methods: We conducted a retrospective cohort study of 1,269 adults aged ≥65 years discharged from a Maltese acute hospital to LTC (September 2023–September 2024). The HOSPITAL score was calculated at discharge. Primary outcome was all-cause readmission within 30 days; secondary outcome was 30-day post-discharge mortality. Discrimination (AUROC), calibration (Hosmer–Lemeshow), and explained variance (Nagelkerke R^2) were assessed.

Results: Mean age was 84.6 years (SD 7.3); 69% were female. Thirty-day readmission and mortality rates were 34.8% and 10.8%, respectively. The HOSPITAL score showed good discrimination for readmission (AUROC = 0.727, 95% CI 0.697–0.756) and moderate discrimination for mortality (AUROC = 0.677, 95% CI 0.627–0.727). Calibration was acceptable for both outcomes. Nagelkerke R^2 was 0.171 for readmission and 0.072 for mortality.

Conclusions: The HOSPITAL score effectively stratifies readmission risk and moderately predicts mortality, supporting its use in transitional-care planning.

Keywords: "Hospital readmission"; "long term care"; "HOSPITAL score"; "30 day mortality"; "risk prediction"; "older persons".

Highlights:
- Addresses the pressing issue of high 30-day readmission and mortality rates in older adults discharged to long-term care.
- First application of the internationally validated HOSPITAL score to a hospital-to-LTC transition cohort in Malta, using retrospective analysis of 1,269 patients.
- Extends the utility of a widely used risk-prediction tool to a novel, high-risk population, highlighting its potential beyond general medicine discharges.
- Supports the use of the HOSPITAL score in guiding targeted transitional-care interventions and resource allocation to reduce avoidable rehospitalisations and improve outcomes.

Introduction

Unplanned hospital readmissions within 30 days of discharge are a key quality indicator for older persons' medical care. This problem is particularly sensitive for patients who are discharged to long term care (LTC) facilities instead of returning home (Solakoğlu and Bektan Kanat, 2023). Older LTC residents tend to be frailer, have multiple chronic illnesses, and often require complex care, placing them at elevated risk for early rehospitalisation (Lam et al., 2018). Studies indicate that roughly 15–20% of hospitalised older persons discharged to post-acute skilled nursing facilities are readmitted within 30 days (Chandra et al., 2019). These early readmissions can lead to adverse health outcomes and increased healthcare costs, and they often signal gaps in the transition from hospital to LTC. In addition, older patients in transition are vulnerable to high short-term mortality – about 5% die within a month of discharge, even in multimorbid populations with intensive follow-up (Aubert et al., 2022). Identifying high-risk individuals before discharge allows providers to allocate resources to potentially prevent avoidable readmissions and deaths (Donzé et al., 2013).

Predictive risk scores have been developed to flag patients at risk of 30 day readmission. One widely validated tool is the HOSPITAL score, a mnemonic encapsulating seven clinical factors available at discharge (Donzé et al., 2013). The HOSPITAL score assigns points for: low haemoglobin at discharge (H), discharge from an Oncology service (O), low Sodium at discharge (S), any Procedure coded during the index admission (P), an Index admission that was unplanned or emergency (I), number of hospital Transfers/ Admissions in the past year (T), and Length of stay ≥5 days (L) (Donzé et al., 2013). The original score achieved a c-statistic of ~0.71 in the derivation cohort (Donzé et al., 2013) and ~0.72 in an international validation across nine hospitals (Donzé et al., 2016), indicating fair discrimination for predicting 30-day readmissions. Its calibration in diverse settings has generally been good, with predicted risk closely matching observed readmission rates (Donzé et al., 2016). Subsequent studies have confirmed moderate discrimination (e.g. c-statistics ~0.68–0.71) in varied medical populations (Burke et al., 2017; Kim et al., 2016).

However, most research and validations of the HOSPITAL score have focused on general medicine patients discharged home (Solakoğlu and Bektan Kanat, 2023). Less is known about its utility in older patients transitioning from hospital to LTC facilities, who often have different care needs and risk profiles. These individuals may have high rates of cognitive impairment, functional dependency, and frailty that are not directly captured by the HOSPITAL score's hospital-centric variables (Solakoğlu and Bektan Kanat, 2023). It is important to investigate whether the HOSPITAL score can adequately stratify readmission risk in the post-acute LTC setting, or if its performance is diminished in this population. Additionally, while the score was designed for readmission prediction, its components (e.g. oncology status, recent admissions) might also correlate with 30-day mortality risk – an outcome of equal concern when assessing prognosis after discharge (Aubert et al., 2022).

To our knowledge, no prior study has specifically evaluated the HOSPITAL score in a hospital-to-LTC transition cohort in Malta. This study therefore aimed to: (1) quantify the 30-day hospital readmission rate and 30-day post-discharge mortality rate among older adults discharged from hospital to LTC, and (2) evaluate the performance of the HOSPITAL score in predicting these outcomes in this population. Our goal was to determine whether the HOSPITAL score's risk stratification remains effective in this cohort. Ultimately, improving risk prediction in the hospital-to-LTC transition could facilitate targeted interventions to reduce avoidable readmissions and improve short-term outcomes for this vulnerable patient population.

Methodology

Study Design and Setting

We performed a retrospective cohort study among residential clients of Active Ageing and Community Care (AACC) in Malta. The study included older persons (aged 65 and above) who were discharged from the national acute general hospital (Mater Dei Hospital) to an LTC facility between September 2023 and September 2024. The study was approved by the IDEA Research Ethics Board and the AACC Data Protection Officer, with a waiver of informed consent due to the retrospective design using data which was de-identified by a gatekeeper.

Data Collection

Using the hospital's electronic records system (iSoft Clinical Manager), we extracted demographic data (age, sex) and clinical information including comorbidities and admission type (planned vs emergency). Laboratory results at discharge (such as haemoglobin and sodium levels) were obtained. The length of the index hospital stay and the number of hospital admissions in the 12 months preceding the index admission were recorded. Patients discharged from an oncology ward were also identified. All variables extracted were used to calculate the HOSPITAL score for each patient as originally described by Donzé et al. (2013). The HOSPITAL score ranged from 0 to 13, with higher scores indicating greater predicted risk of 30-day potentially avoidable readmission.

Outcomes

The primary outcome was all-cause hospital readmission within 30 days of discharge to LTC. Any unplanned admission Mater Dei Hospital within 30 days of the index hospital discharge was counted as a readmission. The secondary outcome was 30-day all-cause post-discharge mortality. For patients who experienced multiple events, we noted that if a patient died after being readmitted, they counted towards both the readmission and mortality rates.

Statistical Analysis

Patient characteristics and outcomes were summarised using descriptive statistics. Continuous variables (e.g. age, hospital length of stay, HOSPITAL score) are presented as means and standard deviations (SD), and categorical variables (e.g. sex) as frequencies or percentages. To evaluate differences in mean HOSPITAL scores between outcome groups, independent-samples t-tests were performed for: (a) 30-day readmission (readmitted vs non-readmitted), and (b) 30-day mortality (deceased vs surviving). Prior to each t-test, the assumption of normality was assessed via inspection of histograms and skewness, and equality of variances was tested using Levene's test. Where Levene's test was significant, Welch's correction to the t-test was applied.

The predictive performance of the HOSPITAL score for each outcome was evaluated in several ways. Discrimination was quantified using the area under the ROC curve (AUROC) for readmission and for mortality, each with 95% confidence intervals. An AUROC of 0.5 indicates no discriminative ability, whereas 1.0 indicates perfect discrimination. Calibration was assessed using the Hosmer–Lemeshow goodness-of-fit test (non-significant p-values indicate good calibration). Nagelkerke's R^2 was calculated to indicate the proportion of outcome variance explained by a logistic model including the HOSPITAL score. All analyses were conducted using IBM SPSS Statistics (Version 28.0), with two-tailed significance set at α=0.05.

Results

The sample consisted of 1,269 patients with a mean age of 84.57 years (SD 7.28). The majority were female (69.1%). Index hospital admissions had a mean length of stay of 7.46 days (SD 10.24, range 1–146). The overall 30-day hospital readmission rate was 34.8%, and the 30-day post-discharge mortality rate was 10.8%. Most discharges (87.9%) were to privately-public partnership (PPP) LTC residences, with 12.1% to state-run facilities. Common comorbidities in the cohort included cardiovascular disease (~56.5% of patients) and diabetes (~38%). There were no notable differences in comorbidity prevalence between patients in PPP versus state-run facilities (Figure 1).

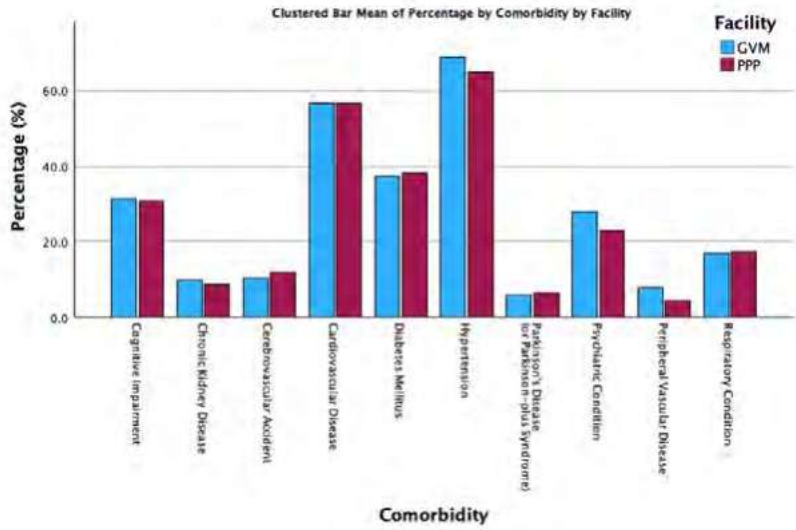

Figure 1: Comorbidity distribution by facility

The mean HOSPITAL score for the entire cohort was 4.32 (SD 1.72), with individual scores ranging from 1 to 11. Patients who were readmitted within 30 days had a significantly higher mean HOSPITAL score compared to those not readmitted (5.16 ± 1.66 vs 3.87 ± 1.55, p<0.001). Similarly, patients who died within 30 days of discharge had higher scores than survivors (5.29 ± 1.71 vs 4.20 ± 1.63, p<0.001).

ROC curve analysis demonstrated that the HOSPITAL score had good predictive accuracy for 30-day readmissions, with an AUROC of 0.727 (95% CI: 0.697–0.756). Figure 2 illustrates the ROC curve for readmission prediction based on the HOSPITAL score.

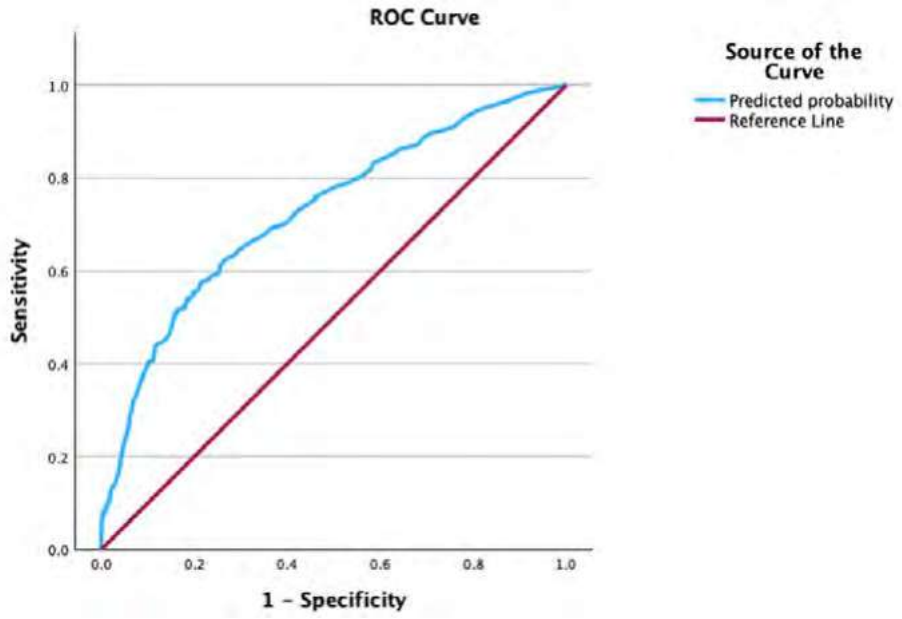

Figure 2: ROC curve for 30-day readmission based on HOSPITAL score

For predicting 30-day post-discharge mortality, the HOSPITAL score showed moderate discriminative ability, with an AUROC of 0.677 (95% CI: 0.627–0.727). The ROC curve for mortality prediction is shown in Figure 3.

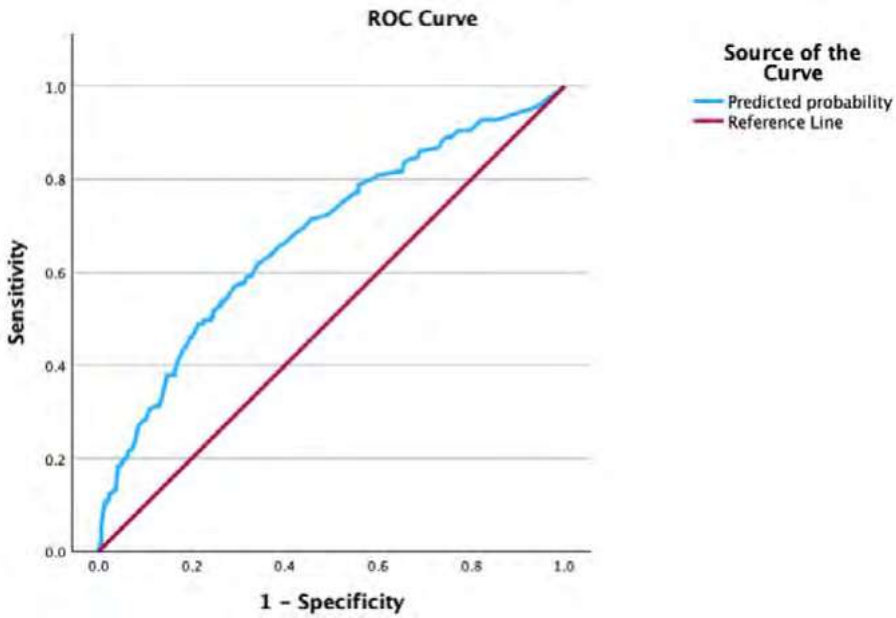

Figure 3: ROC curve for 30-day post-discharge mortality based on HOSPITAL score

Calibration assessed by the Hosmer–Lemeshow test indicated acceptable model fit for both readmission ($p = 0.229$) and mortality ($p = 0.794$) predictions, as neither goodness-of-fit test was significant. In logistic regression models including only the HOSPITAL score, Nagelkerke's R^2 was 0.171 for readmission (indicating the score explained ~17% of the variability in 30-day readmissions) and 0.072 for mortality (~7% of the variability in 30-day mortality).

Discussion

In our Maltese transition cohort, 30-day readmission (34.8%) and mortality (10.8%) rates were substantially higher than typical estimates for older patients discharged from hospital. Prior studies report roughly 15–20% readmission rates for discharged older adults in general (Glans et al., 2020), and in a large Ontario cohort only about 12.4% of patients returning to LTC were readmitted within 30 days (Gruneir et al., 2018). This discrepancy likely reflects the advanced frailty and care complexity of our LTC-bound patients. Indeed, residents of long-term care often have multiple chronic conditions and cognitive impairment, and are known to be much more likely than community-dwelling older adults to experience unplanned hospital admissions and readmissions (Birtwell et al., 2022). Our results underscore the critical vulnerability of older persons during care transitions from hospital to LTC.

Despite the high overall event rates, the HOSPITAL score demonstrated good discrimination for predicting 30-day readmissions in this high-risk population (AUROC 0.727), comparable to its performance reported in other settings (c-statistics ~0.68–0.72). International validations have similarly reported moderate predictive power of the HOSPITAL score for 30-day readmission. For example, the original derivation study found a c-statistic of approximately 0.71 (Donzé et al., 2013), and subsequent validations across diverse hospitals yielded c-statistics in the 0.70 range (Donzé et al., 2016; Burke et al., 2017). Our findings align with these prior results, indicating that the score can effectively stratify readmission risk even among older patients transitioning to LTC.

Notably, a recent study by Solakoğlu and Kanat (2023) also observed an extremely high 30-day readmission rate (43.2%) in a frail elderly cohort admitted via the emergency department, and found that adding a formal frailty score did not appreciably improve the HOSPITAL score's predictive accuracy. This suggests that the HOSPITAL score already captures key risk factors related to frailty and acute illness in older adults.

For 30-day mortality, the HOSPITAL score's discrimination was more modest (AUROC 0.677) – a result consistent with the report by Aubert et al. (2022), which found a c-statistic of ~0.66 for 30-day mortality using the HOSPITAL score in a multimorbid older cohort. Thus, although the score was not originally intended for mortality prediction, a high HOSPITAL score does appear to flag patients at elevated short-term mortality risk. In clinical practice, patients with high scores might benefit not only from intensive transitional care but also from early goals-of-care discussions or palliative care involvement, given their limited prognosis. Importantly, in our study the score's calibration remained good for both outcomes, meaning the absolute risk estimates it provides were broadly accurate even if discrimination for mortality was only moderate. Good calibration is critical if the score is to be used to estimate a patient's readmission risk and trigger interventions.

Our findings reflect established risk factors for adverse outcomes in older patients. Prior work has identified a higher comorbidity burden and polypharmacy as significant predictors of readmission in older people (Glans et al., 2020), consistent with the concept of frailty and accumulated deficits (Clegg et al., 2013). Many of these factors are indirectly included in the HOSPITAL score; for example, multiple prior admissions or low haemoglobin often indicate chronic disease severity and frailty. Nevertheless, our analysis lacked direct measures of geriatric conditions, such as frailty indices, functional status, or cognitive impairment, which likely play key roles in determining outcomes in this setting. The Nagelkerke R^2 values of 0.171 for readmission and 0.072 for mortality indicate that the HOSPITAL score alone explains only a portion of the variability in these outcomes, suggesting there is room to improve predictive models.

Strengths and Limitations

Strengths of our study include the relatively large sample size and complete 30-day follow-up achieved through high-quality linked administrative and clinical data. We applied a well-established risk model and rigorously assessed both its calibration and discrimination in a novel patient population. However, several limitations merit acknowledgement. The retrospective, single-centre design may limit generalisability beyond Malta. Our findings must be interpreted in light of local practices that may differ from those elsewhere. For example, patients with oncological illnesses in Malta are frequently admitted under general medical or surgical wards rather than specialised oncology units, which could influence how the "O" component of HOSPITAL is assigned. Additionally, the use of the ICD-9 procedure coding system locally means that even routine procedures (e.g. a chest X-ray performed on nearly all admissions) count as coded procedures, potentially inflating the HOSPITAL score's procedure component in our cohort. These local factors should be considered when applying our results to other settings.

Clinical Utility

From a clinical perspective, our results highlight the need for targeted interventions for high-risk patients leaving the hospital for LTC. Using the HOSPITAL score at discharge is practical; it relies only on routine clinical data and could help identify older persons who may benefit from intensive transitional care (for example, comprehensive medication review, early post-discharge follow-up, or enhanced communication with LTC facility staff). Evidence shows that structured transitional-care interventions can substantially reduce readmissions in LTC populations (Birtwell et al., 2022). In a recent meta-analysis, older LTC residents who received dedicated transitional care programs were about 40% less likely to be re-hospitalised than those receiving usual care (Birtwell et al., 2022). Healthcare systems should therefore invest in programmes such as enhanced discharge planning and multidisciplinary care teams to support patients at risk of readmission. Future research should test the impact of risk-guided transitional interventions and explore whether adding factors like frailty or facility-level characteristics to predictive models can further improve accuracy. Notably, other investigators have developed new readmission risk models specifically for patients discharged to post-acute care facilities (Chandra et al., 2019), indicating that tailored approaches might augment or complement the use of a general score like HOSPITAL in these settings.

Conclusions

Older persons discharged to LTC face very high 30-day readmission and mortality rates. The HOSPITAL score proved useful for stratifying readmission risk in this population, with predictive performance comparable to that observed in prior studies of more general patient cohorts, and it showed moderate utility for mortality prediction. This is the first study to assess the score in a hospital-to-LTC transition cohort, highlighting this period as a time of marked vulnerability. Routine use of the HOSPITAL score, alongside targeted transitional-care strategies, may help reduce avoidable rehospitalisations and improve outcomes. Incorporating geriatric-specific factors could further refine prediction and support resource allocation in this frail population.

Conflict of Interest

The authors declare no competing interests.

Authorship

The percentage of each author's contribution to the manuscript:

Dr Sephora Santucci: 25%
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Dr Karl Spiteri: 25%
Dr Tracy Lee Vidal: 25%

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07 The Empowerment of Elderly Individuals Regarding the Risk of Falls (TEEI-FALLS) Tool: Translation to English and Maltese and Cross-Cultural Validation

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Abstract

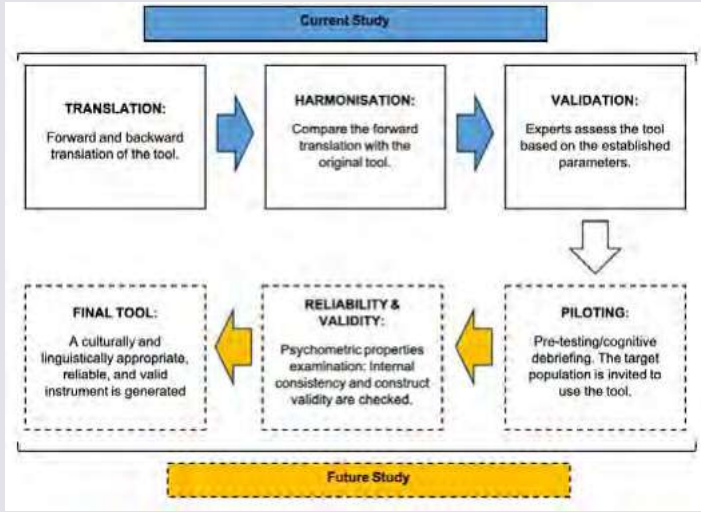
Objectives: To assess the interchangeability of The Empowerment of Elderly Individuals Regarding the Risk of Falls (TEEI-Falls) tool when used with elderly people living in Malta, considering aspects related to the Maltese healthcare system, as well as the cross-cultural aspects applicable to this scenario.

Methods: The translated tool (English and Maltese versions) was distributed to experts for face-to-face validity. They evaluated the tool based on the following validation criteria: (1) clarity of language, (2) practical relevance, (3) theoretical relevance, and (4) theoretical dimension. The TEEI-Falls tool items were assessed using a scale ranging from 1 (Poor) to 5 (Excellent). All feedback received was analysed and the tool was revised accordingly. The responses were grouped into two categories: Positive Trend (4 "Above Average" and 5 "Excellent") and Negative Trend (1 "Poor" and 2 "Below Average").

Results: Eight experts received and returned the questionnaire with their feedback. Five experts held a Master's degree and three held a Doctorate, all of them holding relevant expertise in the field. Most of the items of the TEEI-Falls tool (90.4%) were scored as "Above Average" (4) or "Excellent" (5) across all dimensions (susceptibility, severity, benefits, and barriers) and validation criteria (clarity of language, practical relevance, theoretical relevance, and theoretical dimension). Changes to the tool were calibrated according to their coherence and relevance.

Conclusions: Following expert suggestions, the TEEI-Falls tool underwent adjustments, resulting in its harmonisation. The adjustments enabled the tool to demonstrate cross-cultural interchangeability, showcasing its potential as a valuable resource for empowering elderly individuals in Malta to assess and mitigate the risk of falls.

Keywords: "Risk of Falls"; "Falls Prevention"; "Older Adults"; "Elderly Individuals/People"; "Fall Risk Assessment Tool" .



Graphical Abstract: TEEI-Falls Tool Translation and Validation Process

Highlights:

- Falls in older adults remain a significant public health concern.
- A scale-based instrument - The Empowerment of Elderly Individuals regarding the Risk of Falls (TEEI-Falls) tool - was developed and validated in Brazil using a large sample of community-dwelling elderly individuals.
- This tool, the TEEI-Falls tool, was successfully translated and adjusted to adapt to the Maltese cultural context.
- Face-to-face validity by experts revealed some important aspects for the TEEI-Falls tool's complementary harmonisation.
- The TEEI-Falls tool presents a promising resource for older adults in Malta to manage fall risk and prevention.

List of Abbreviations:
Elderly Individuals/People and Older Adults: In this paper, the terms "elderly individuals/people" and "older adults" are used interchangeably and are regarded by the authors as synonyms.
Experts: The individuals who validated the TEEI-Falls Tool.
EEPRIQ: Escala de Empoderamento dos Pacientes Idosos acerca do Risco de Quedas.
TAA–Waqgħat: Tisħiħ tal-Awtonomija tal-Anzjani rigward ir-Riskju tal-Waqgħat.
TEEI-Falls: The Empowerment of Elderly Individuals regarding the Risk of Falls.

Introduction

Falls in elderly people are one of the most common and serious problems which represent a global health challenge (Salari et al., 2022). According to a recent study published by Kumar et al., in 2025, there has been an increase in fall-associated injuries, hospitalisations, and mortality, which underscores the urgent need for targeted multifactorial interventions. Thus, there is a need to systematically develop and proactively tailor multifactorial falls prevention interventions and implementation strategies to the context.

Faced with this scenario, researchers from Brazil developed a scale-based instrument, which was subsequently validated using a large sample of community-dwelling elderly individuals (Freitas et al., 2024). The research followed a rigorous, multi-step process to ensure the validity and reliability of a new tool.

This tool, titled The Empowerment of Elderly Individuals regarding the Risk of Falls (TEEI-Falls), was translated into English and Maltese. The TEEI-Falls tool is structured on the health decision-making (cues to action) following the Health Belief Model (HBM), which was authored by Rosenstock (1974), later discussed by Rosenstock, Strecher and Becker (1988), and more recently critically assessed by Abraham and Sheeran (2015), resulting in 4 dimensions (perceived individual beliefs):

- Dimension of susceptibility: The individuals' perception of the risk of falling, how susceptible they are, and the benefits of preventing falls. The greater their perception of vulnerability and susceptibility, the greater their change in behaviour towards risk prevention attitudes.
- Dimension of severity: The individuals' perception of the level of severity and seriousness of the fall and its consequences. The greater their perception of risks and severity, the greater their inclination to adopting fall prevention behaviours. The individuals relate to the risk and seriousness of their emotional, biological, and financial state, depending on their most fearful interests, and, consequently, take measures to adhere to fall prevention strategies.
- Dimension of benefits: The individuals' perception that all the positive benefits they acquired by preventing the risk will keep them active and healthy.
- Dimension of barriers: The individuals' perception of the negative benefits (barriers) which they need to face in order to adhere to protective measures against falls. They can either choose to change their attitude and face the barriers to prevent falls, or maintain the same attitude and, as a result, continue to struggle with those barriers and remain at risk of falling.

This tool targets elderly individuals (aged 60+) living in their own homes with family members, relatives, or close friends, and those living in residential care homes, who are not permanently wheelchair bound. In the future, this target audience will be invited to complete the tool (TEEI-Falls) by choosing the most appropriate option according to the following Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The tool (TEEI-Falls) will be provided in either English or Maltese, depending on the participant's preference.

In this current study, this validation process aimed to assess the interchangeability of this tool when used with elderly people living in Malta, considering aspects related to the Maltese healthcare system, as well as the cross-cultural aspects applicable to this scenario.

Methodology

2.1 Translation and Validation Process

The translated versions of the tool were first revised by native speakers in both languages and adjusted accordingly. The tool, which compiled the English and Maltese translations, was distributed to a purposive sample of experts for face-to-face validity, based on Pasquali et al. (2010), (Appendix 1). The tool was accompanied with instructions to guide the experts on the validation process. The experts were asked to evaluate the tool (TEEI-Falls) based on the following validation criteria: (1) clarity of language, (2) practical relevance, (3) theoretical relevance, and (4) theoretical dimension. It was calculated that, across all dimensions, the tool has 220 items in total. The experts were invited to evaluate the TEEI-Falls tool items using a scale ranging from 1 (Poor) to 5 (Excellent).

The validation criteria-concepts are explained as follows:

- Clarity of language: Considers the language used in the tool, considering the characteristics of the population interviewed (elderly people). Implicit questions: "Do you believe that the language of each item in the TEEI-Falls tool is sufficiently clear, understandable, and appropriate for this population? To what extent?"
- Practical relevance: Considers whether each item was designed to assess the concept of interest amongst a given population (elderly people). This validation criteria analyses whether each item is, in fact, relevant to the tool. Implicit questions: "Do you believe that the proposed items are relevant for this population? Are the items contextualised to the reality of Malta? To what extent?"
- Theoretical relevance: Considers the degree of association between the item and the theory, aiming to analyse whether the item is related to the research construct (i.e., variables and indicators, to which values can be assigned, according to a set of instructions, in order to explain the phenomena/events). Implicit questions: "Do you believe that the content of the proposed items is representative of the phenomena/events to be measured, considering the theory in question (OREM, 1981)? To what extent?".
- Theoretical dimension: Investigates the adequacy of each item with regards to scientific theory. Implicit questions: "Do you believe that the items are addressing each dimension? To what extent?"

2.2 Validation Analysis and Tool Revisions

All feedback received was assessed carefully. The TEEI-Falls tool items rated 4 or 5 on the Likert scale were considered positive (indicating a positive trend), and recommendations within this range were deemed minor. Feedback marked as 3 was considered as vague and was analysed cautiously and, when relevant, the experts' recommendations were integrated in the tool. The level of relevance was assessed by the authors considering the validation criteria concepts above. Feedback rated 1 or 2 was considered negative (indicating a negative trend), and the comments received were carefully evaluated. In this sense, the responses were grouped into two categories: Positive Trend (4 "Above Average" and 5 "Excellent") and Negative Trend (1 "Poor" and 2 "Below Average"). Changes to the tool were calibrated according to their coherence and relevance.

2.3 Ethical Considerations

In this validation study, participation was limited to experts in elderly care and related fields, who assessed the clarity, relevance, and theoretical coherence of the TEEI-Falls tool. Ethical considerations, therefore, focused on ensuring that the respondents' participation was voluntary and that their identities and professional feedback remained confidential.

Results

Eight experts received, filled in, and returned the questionnaire with their feedback. Five experts held a Master's degree and three held a Doctorate. Most participants (6) reported having experience in Elderly Care, one in healthcare settings, and one in business management and social security. Six experts had more than 21 years of experience, and two held experience ranging from 6 to 10 years.

Most of the items of the TEEI-Falls tool (90.4%) were scored as "Above Average" (4) or "Excellent" (5) across all dimensions (susceptibility, severity, benefits, and barriers) and validation criteria (clarity of language, practical relevance, theoretical relevance, and theoretical dimension). Some of the items (6.6%) were scored at "Average" level (3) with regards to some dimensions and validation criteria, while a few others (3.0%) indicated it to be "Poor" (1) or "Below Average" (2). The responses were grouped into two categories: **Positive Trend** (4 "Above Average" and 5 "Excellent") and **Negative Trend** (1 "Poor" and 2 "Below Average"). The trend classification is shown in **Figure 1**.

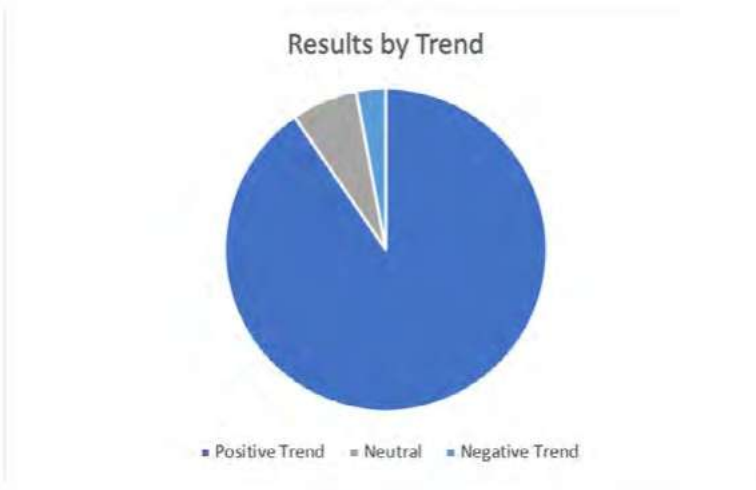


Figure 1. Results by trend.

The feedback received from items classified within the positive spectrum was interpreted as minor, however it was integrated into the tool review when and where relevant. This type of feedback concerned mostly rewording, rephrasing, or defining certain vague English and Maltese sentences and terms so that they are more direct and elderly individuals would not find any difficulty in understanding the intended meaning. Certain experts also suggested the avoidance of instructive language which would have the undesired effect of leading the respondents. This implied the rewording of certain items so as to maintain neutrality. One expert also recommended to soften slightly the wording and tone of some items in order to avoid shame or defensiveness from the respondents' end. Moreover, examples were provided next to terms which the target audience would possibly find overwhelming to think of options. Furthermore, certain timeframes were specified so as to avoid recall bias.

All responses defined as "Average" (3) were subject to analysis and, when relevant, such recommendations were integrated into the tool. The main, recurring issue which the experts remarked on was the use of the language. The respondents remarked on the complex structure of some of the sentences which could potentially confuse the target audience. This was acted upon and, in accordance with the experts' suggestions, the statements were reworded in a more direct and simplified manner using, where possible, everyday language. Moreover, certain terms which elderly individuals would perhaps not be familiar with, such as vertigo, were defined, so as to avoid misunderstandings. Some experts also recommended merging or removing some items to avoid repetition; these cases were carefully analysed and, where applicable, this suggestion was taken forward. The applicability was based on suggestions given by the expert/s and the approval of the originating authors of the tool. It was also recommended by some experts that examples be included when referring to terms that imply a list such as medical conditions, medication, injuries, daily activities, etc.

Some statements, which were negatively framed, were also reworded positively so as to avoid the risk of misinterpretation. Also, certain terms which were of a subjective character were reworded. Some experts also recommended the rewording of specific items, so they are a better fit under the respective categories. This was taken on board and acted upon.

Although the number of responses with a negative trend was small, all of these responses were subject to investigation, considering their major relevance, and the related items were adjusted based on the experts' recommendations. Table 1 shows the items classified within this spectrum, with those identified by more than one expert highlighted in bold.

	Negative Trend	
Experts	**1. Poor**	**2. Below Average**
1	-	-
2	-	-
3	-	-
4	OQ n.3	1.3; 2.9; 4.11; 4.14
5	1.4; **1.9**	1.2; 2.6; 2.7; 2.10
6	3.6; 4.5; **4.8**; 4.10; 4.12	1.7; 2.3; 4.13
7	4.7; **4.8**	4.9; OQ n.4
8	-	**1.9**; 1.10; 3.11; 3.12

Table 1. The TEEI-Falls tool items are classified as poor or below average.
Note: OQ, Open Question section; n, number.

The main changes made to the tool include rewording unclear items, splitting multi-part questions, and clarifying vague terms with examples or defined timeframes. With regards to the first point, which concerned the use of the language, changes were made mostly to the Maltese translation, although there were some adjustments which needed to be made to the terms used in English. Some of the experts commented on the abstract nature of how some of the phrases were worded. These were adjusted, in order to avoid ambiguities, and were rephrased in a more direct and simplified manner so as to be understood clearly by elderly individuals. This would enhance readability and response ease.

Some experts also remarked on the use of instructive language in some of the items which, following this feedback, were amended and rephrased. Furthermore, certain experts suggested that some items, being two-pronged statements, be split into two in order to avoid confusion and an overwhelming feeling amongst the respondents. This was taken on board and adjusted in the tool.

The items which alluded to a list were provided with examples so as to simplify their meaning. Moreover, the items which contained vague phrases regarding timeframes (e.g., recently) were provided with specific time periods to avoid recall bias.

Certain experts also remarked upon the fact that one of the open-ended questions should not have a scale, so this was removed.

The adjusted tool following validation can be seen in Appendix 2. This tool will target elderly individuals (aged 60+) living in their own homes, with family members, relatives, or close friends, and those living in residential care homes, who are not permanently wheelchair bound. Participants will be invited to complete the tool (TEEI-Falls) by choosing the most appropriate option according to the Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The tool (TEEI-Falls) will be provided either in English or Maltese, depending on the participant's preference. This tool will be subject to a pilot study in the future that will statistically assess its reliability and validity.

Discussion

According to Ms Mary Lou Grech, the Principal Physiotherapist in the Department for the Elderly and Community Services in Malta:

Falls are the most common cause of injury in older persons (OP) and become more frequent with advancing age. There is a higher chance that a fall in an OP leads to trauma due to decreased protective reflexes and the saving mechanism. (Grech, 2005)

Ms Grech also highlighted that the real picture in Malta is that "services in the community are still lagging far behind. The established government physiotherapy services for older persons available are those in institutional systems in acute, rehabilitation and long-term care. However, institutionalization of people suffering from falls is not the solution. It actually increases their number of falls" and complemented that "health promotion on falls prevention and management should mainly be targeted" (Grech, 2005).

Almost 20 years later, in 2024, Zammit examined the correlation between gender, age, and dependency levels with the occurrence of falls among older persons living in care homes in Malta. The occurrence of falls was documented throughout the year 2023 and out of the 215 reported fall incidents among the elderly between 65 and 99 years old, 140 individuals (65%) were female, while 75 individuals (34.8%) were male. It was observed that individuals with a medium level of dependence (54.4%) fell more than other groups. Regarding origin of falls occurring in residential care homes in Malta, falls occurred most commonly whilst using toilets and commodes (30%), followed by residents who suffered falls whilst walking (20.5%), bed-related falls (15%), and during transfers that involved moving between different positions, such as transitioning from bed to wheelchair (10%), among others. The results indicated that falls in older persons are more attributed to personal and environmental factors, including medication, previous falls, and risk factors associated with comorbidity, irrespective of the circumstances.

Concerned with this matter, Cini, Flores, and Bonanno (2025) conducted a study aimed at developing a falls management framework for older persons living in the Maltese residential care home setting, which is currently lacking. The conceptual framework was evaluated by comparing it with various international falls management frameworks. The Maltese framework for falls management combines elements related to the old persons' level of necessity with predictive (multifactorial risk assessment and fall risk stratification), preventative (individualised fall prevention plan), and post-fall management (procedural and participatory measures) strategies.

The scenario highlighted by Grech (2005) and Zammit (2024), and the risk assessment criteria pointed out by Cini, Flores, and Bonanno (2025) in the Maltese framework for falls management, reflect the importance of having a tool that can assess the risks related to falls while also empowering the target population to seek preventive measures. In this sense, the TEEI-Falls tool seems to fill this gap.

Malta's efforts in falls management, while lagging, are in line with global strategies. This can be observed from some scientific findings found in the literature, which also show that falls in elderly individuals are not a problem restricted to Malta **(Table 2)**.

Reference (Author, Year)	Key Findings on Prevalence, Risk Factors, & Consequences	Key Findings on Economic & Social Impact
Montero-Odasso et al. (2022)	A global initiative providing comprehensive guidelines for falls prevention and management, underscoring the universal significance of falls as a public health challenge. It stresses the necessity of a multifaceted approach to prevention.	This guideline highlights the global burden of falls and the pressing need for organised prevention strategies to mitigate costs and improve health outcomes.
The National Council on Aging (2025)	In the U.S., approximately 14 million (one in four) adults aged 65 and older fall each year. Falls are the leading cause of fatal and non-fatal injuries. 38,000 deaths in 2021 were attributed to falls in this age group.	The cost of treating fall-related injuries is projected to exceed $101 billion by 2030. The average annual cost for an inpatient visit for a fall injury is approximately $18,658.
Deandrea et al. (2010)	A systematic review and meta-analysis confirmed key risk factors for falls in community-dwelling older adults. The strongest associations were found for history of falls (OR = 2.8 for all fallers; OR = 3.5 for recurrent fallers), gait problems (OR = 2.1; 2.2), walking aids use (OR = 2.2; 3.1), vertigo (OR = 1.8; 2.3), Parkinson disease (OR = 2.7; 2.8), and antiepileptic drug use (OR = 1.9; 2.7).	The study emphasises the burden on public health resources and the significant financial strain on patients and their families.
Jayakody et al. (2022)	Falls are longitudinally associated with a future risk of cognitive decline and dementia. This highlights the complex relationship between physical decline, motor function (including gait and balance), and cognitive health.	The research emphasises the long-term, cascading effects of falls on an individual's quality of life and independence.
Adam et al. (2024)	While much is known about acute injuries from falls, the study highlights the long-term impacts on functional ability. Falls reported in the previous 6 months were associated with impairment in ADLs (HR: 1.42; 95% CI 1.32, 1.52) in fully adjusted models. Falls often lead to a significant decline in Activities of Daily Living (ADLs), and females who lived in a neighbourhood with higher deprivation, or experienced polypharmacy, were more likely to have ADL impairment post-fall.	The decline in ADLs and functional independence due to falls has a profound social impact, leading to a greater need for formal and informal care, increased risk of institutionalisation, and poorer mental health.
Haddad et al. (2024)	The number of fall-related emergency department visits, hospitalisations, and deaths is rising. Approximately 1 in 4 older adults falls each year, with over half of those who fall requiring hospital care.	The total healthcare spending for non-fatal falls in older adults in the USA was approximately $80 billion in 2020, a significant increase from previous estimates. The majority of these costs are borne by Medicare.
Vandervelde et al. (2025)	The BE-EMPOWERed program was developed as a comprehensive falls prevention initiative to increase the acceptance and effectiveness of multifactorial falls prevention interventions in community-dwelling older adults. The BE-EMPOWERed program includes a group-based intervention for older people and workshops for healthcare professionals.	Falls among people aged 65 years and older represent a global health challenge, with substantial morbidity, mortality, and economic costs. The successful implementation of multifactorial falls prevention interventions in community settings requires addressing multiple contextual levels, from individual to organisational and policy-related factors.

Table 2. Summary of relevant evidence on elderly falls.

Note: The information provided here is a summary based on recent and relevant publications. It is not an exhaustive list. The economic impact data (e.g., costs) is highly dependent on the currency and healthcare system of the country studied (e.g., USA, UK, etc.) and such data was provided in US Dollars.

At this stage, the TEEI-Falls instrument underwent face-to-face validation by experts to assess cross-cultural adaptation and verify interchangeability between the instrument validated in Brazil and the one translated into English and Maltese for use in Malta.

Linguistic validation was carried out by native speakers of Maltese and English to ensure semantic and idiomatic equivalence, carefully observing whether the translated statements carried the same meaning as the original. Cultural adaptation was considered in order to assess the cultural relevance and appropriateness of underlying concepts and experiences highlighted in the instrument so that the Maltese target population could understand the tool items.

Beaton et al., (2000) stated that the process of cross-cultural adaptation tries to produce equivalency between source and target based on content, and was endorsed by Wild et al., (2005), who emphasised that each approach to translation and cultural adaptation is considered systematically in terms of rationale, components, key actors, and the potential benefits and risks associated with each approach and step.

As reported, the validation process showed a positive trend (4 "Above Average" and 5 "Excellent") for the majority of the items in the TEEI-Falls tool; All feedback received was carefully evaluated and, when relevant, integrated into the tool. This is in line with Freitas et al., (2024), who demonstrated, in the final stage of the evaluation of this tool – TEEI-Falls, originally published as Escala de Empoderamento dos Pacientes Idosos acerca do Risco de Quedas (EEPRIQ) – that the content validity was according to reference standards and showed high levels of agreement (>85%) and relevance (S-CVI/AVE>0.80). The TEEI-Falls tool proved to be a valid and robust instrument for measuring the empowerment of elderly patients during outpatient consultations.

In the future, as part of the TEEI-Falls tool, a pilot study and psychometric analyses are expected to take place.

With regards to limitations, this study still lacks additional data from other validation stages that could further substantiate the preliminary results of this tool, such as the pilot study that will be conducted in the future.

Conclusions

Following expert suggestions, the TEEI-Falls tool underwent adjustments, resulting in its harmonisation. The adjustments enabled the tool to demonstrate cross-cultural interchangeability, showcasing its potential as a valuable resource for empowering elderly individuals in Malta to assess and mitigate the risk of falls.

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Conflict of Interest

None.

Authorship

The percentage of each author's contribution to the manuscript:

FCMP – 30%
LM – 30%
SSF – 12%
NMV – 15%
RCO – 10%
EMRV – 3%

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08 Student Support Services in a UK Further–Higher Education College: Institutional Perspectives.

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Abstract

Objectives: This study focuses on student support services at a UK further and higher education institution. It examines how managers, administrators, and academics view their impact on students' academic journeys.

Methods: This study is based on 32 interactive, in-depth semi-structured interviews with participants from a multicampus college. It uses inductive thematic analysis to help understand how student support services are designed and implemented.

Results: The findings show that this institution offers a wide range of student support services. It has an active student voice structure that is formally included in governance. However, despite the significant investment made, resources are still not enough to meet student needs.

Conclusion: The study reveals that incorporating student voices within an educational institutional framework, is critical to implement effective student-centred support. Areas for improvement include increasing mental health support, enhancing communication between departments and with students, and ensuring the consistent, regular use and updating of student records.

Keywords: "Support Services"; "Further and Higher Education"; "Institutional Perspectives"

Highlight:
Including student voice at governance level contributes significantly to the enhancement of student services by rendering them more personalised and responsive to student needs.

Introduction

Students' successful progression and completion remain persistent concerns across national and European education systems. In the Annual Activity report 2024 for Eurostat (European Commission, 2025), the rate of early school leavers in European countries was 9.3%. This rate is still above the 2030 target of 9%, highlighting that more work is needed to tackle the challenges students face during their academic journeys.

For many students, financial worries, the impact of generative AI on study and assessment, and schools that are not quite meeting their needs all add up to extra pressure (EDUCAUSE, 2024). Indeed, as pressures increase, higher education must reimagine support that helps students balance study load with wellbeing and personal development.

Early targeted and integrated interventions are suggested possible strategies which promote engagement and retention rates (Cedefop, 2023 and OECD 2023), since students benefit most from personalised support. This is the core rationale for student services, which provide non-academic support programmes that nurture well-being, growth, and success (Schuh et al., 2011, 2018).

This study looks at how a large, multi-campus institution in England coordinates student support, highlighting perceived strengths and challenges.

This study is guided by the following research questions:

1. How do institutional representatives perceive the effectiveness of current student support services?

2. According to institutional representatives, what needs improvement?

Literature Review

Within the context of the broader literature, the ecosystemic view, as illustrated in Ungar's model (2021), which was founded on Bronfenbrenner's ecosystemic model (1979), portrays several interrelating factors that influence the effectiveness of students' services. Teaching, assessment, and timetabling processes, are identified as playing an important part in the overall student experience. However, frameworks advocating holistic approaches to mental health and well-being such as the University Mental Health Charter and the UK's Stepchange Framework also merit consideration. These approaches see mental health as an integral component of student learning and success, and locate responsibility for student welfare across academic units, professional services, and senior leadership (Student Minds, 2024; Universities UK, 2023).

Similarly, Schuh et al. (2018) illustrate that professionals within the student services support students' intellectual, social, and identity development within environments guided by equity, ethics, and developmental theory (ibid, 2018). In their view, student services work best when they are well coordinated, theory-informed, ethical, and equipped with wide-ranging skills to respond to students.

This perspective is reflected in the EUA's Trends report which highlights growing expectations for structured student participation in governance and quality processes (Gaebel, Zhang and Stoeber, 2024). For support services, this translates into co-designed processes between institutional representatives and students that reflect lived experiences and foster trust and engagement within an effective educational ecosystem.

Thornhill's (2016) approach, which mirrors Schuh et al. (2018), puts student voice at the centre of co-design. She maps two ecosystems—one with structured participation and feedback, and one without. In the former, services tend to be more responsive, inclusive, and co-designed, encouraging a culture of transparency, shared ownership, and personalised support. In contrast, the latter outlines that the absence of voice results in inflexibility, low engagement, and support which is not aligned to student needs.

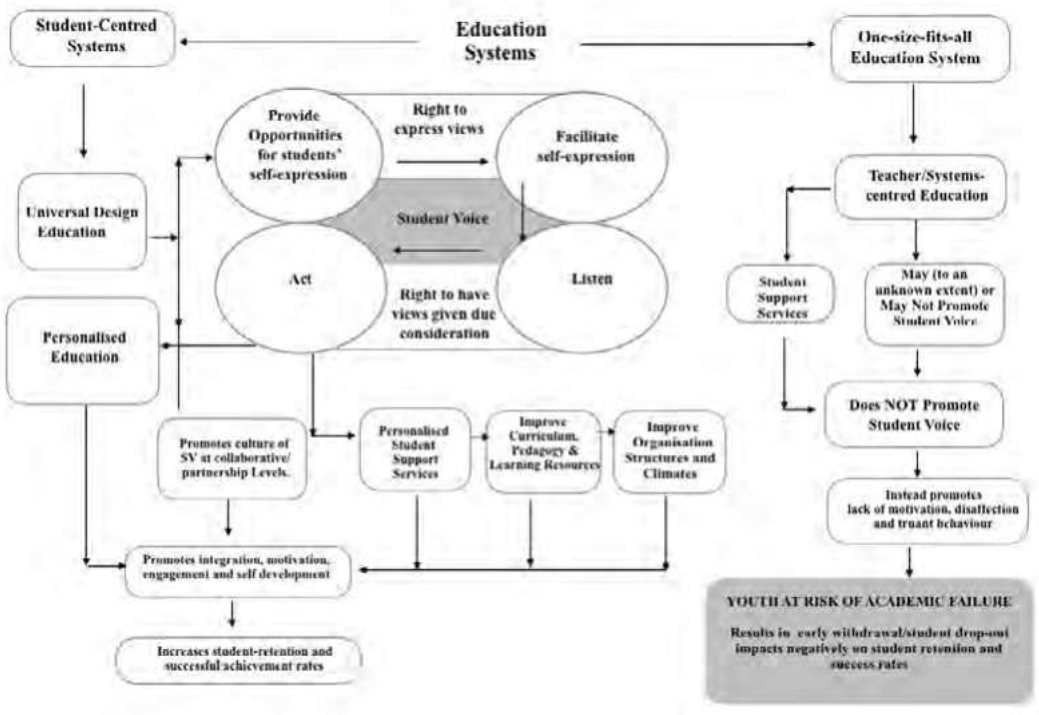

Figure 1: Student Voice in Studen t-Centred Ecosystems vs. One-Size-Fits-All Systems (Thornhill, 2016: 211)

The student-centred model illustrated in figure 1 complements the underlying philosophy of the Universal Design for Learning (UDL) framework, which is especially relevant to the initial design of student support services, since it encourages proactive design (like flexible formats and accessible resources) and supports students' executive functioning through study skills and coaching. Staff trained in UDL have the potential to promote better accessibility and wellbeing, although strategic support is an important component of its effective implementation (Pais et al., 2025). Likewise, Schuh et al. (2018) observe that inclusion happens when there is equity-focused leadership, staff feeling validated and important, and in-built flexibility of interventions is in place to cater for the different learners' needs, mental health pressures, and any other transformations.

Hauschildt et al. (2024)'s EUROSTUDENT 8 report shows that mental health and well-being are impacted by study mode and personal context. This reflects the importance of the provision of individualised student services. Thus, interventions should not be based on a one-size-fits-all approach. Additionally, UK data (King's College London and TASO, 2023; Sanders, 2023) show rising disclosures of poor mental health. To address this, universities have invested more and teamed up with the NHS and other providers (OfS, 2023; House of Commons Library, 2025), but questions remain about long-term sustainability.

Methodology

This study was carried out in a UK further and higher education institution. It adopts an interpretivist approach and uses an exploratory qualitative case study, which was analysed thematically. Data were gathered through self-observations (as shown in Figure 2 below) to help researchers gain a better understanding of the cultural context of the empirical setting (Alvesson, 2003), as well as through semi-structured interviews.

Main Observations	
Identified Strengths:	- Staff consistently portray a very professional approach. - Noted positive outlook, disposition and respect towards students. - All interactions were conducted in a calm and assertive manner.
Ambience	- Ambience is quiet, pleasant, and conveying a sense of tranquility. - People are very nice and supportive. - Maintenance work blends in with minor interruptions (those witnessed). - Some offices look overpacked. - Some areas are more modern than others. - Large library and area for students to work individually or as a group.
General	- The organisation chart is very detailed and its structure at face value, projects a focused provision of student support services. - Noted that for MGT. priority is given to requirements of all schemes/programmes/initiatives which generate funding. - Participants come across as having internalised acceptance of the existing limitations. These limitations are also well explained and justified. - There appeared to be no cognisance at senior level of the fact that some members of staff are under enough pressure to have reached burnout. - Members at senior level also have frantic schedules. Members shifting across different campuses with back-to-back meetings. - Students have a set time to call for assistance across some services. It may appear staff do not feel this may be limiting access to students, since they believe if access was left open throughout the day, they would not have time to do their other tasks.

Figure 2: Researcher's Observations

The researchers are aware that their role, influence and observations within the setting not only allowed them to note small details that otherwise might have been missed, but also helped ensure a better understanding of the context whilst being mindful of potential biases.

For each semi-structured interview, a structured design was adopted. This design is often used in qualitative studies to optimise data collection from experienced professionals (Winwood, 2019). The interview was organised into four stages: first, a general introduction was provided (including self-introduction, the scope of the interview, assurance of anonymity, and the securing of informed consent); second, the participant was invited to introduce oneself, one's department, one's role and the services provided within the department; third, the participant was allowed to reflect on departmental strengths and perceived areas for improvement; and last, was for any emerging issues and concluding remarks. This structure was found to be very useful, as participants were redirected to focus whenever the discussion diverged from the main topic.

Participants

A total of 32 participants were purposively selected from management, administrative, and academic staff within the institution. The sample included members of the senior management team, student services (including guidance, well-being, safeguarding, library, and residential services), curriculum leaders (such as heads of department, course leads, and personal development coaches), as well as representatives from information and registry services and the student union. Participants were selected to provide a wide range of perspectives across key areas identified as influencing student support and engagement through the medium of student support services.

Data Collection and Analysis

All interviews were audio-recorded to ensure accuracy and enable detailed understanding and self-reflective analysis (Creswell and Poth, 2018). In total there were 1082 minutes of audio recordings (18 hours).

The data was analysed using progressive thematic analysis (Braun and Clarke 2021). More specifically, main reflections were first noted from each interview and then these reflections, were merged into subcategories and subsequently, into categories, both across interviews of participants at the same level of institutional representation, as well as across interviews of participants at different levels of institutional representation. As indicated in figure 3 below, whilst most of the themes converged across interviews, some minimal divergence of themes was noted in interviews across different levels of authority and responsibility.

	Identified Strengths	Identified Concerns	Suggested improvements
Convergent subcategories across SAME levels of responsibility.	- Good team work; good intra-departmental communication. - CPD is encouraged. - The institution provides a varied range of student support across campuses. - The IT system is supportive to one's role. - The need for flexibility of role.	- Changes to organisation structure are not effectively communicated, thus impacting internal knowledge and in turn, quality of service rendered to students and general public. - Need more people as the requirements are increasing but the manpower is not. - Some staff feel they are reaching or have already reached burnout.	- Better communication, one which reaches all levels of the institution not just top ones. - More investment in human resources. - More investment in the old parts of the campuses.
Convergent sub-categories across DIFFERENT levels of responsibility.	-Ongoing investment in IT, in staff training, in the provision of support services. -Flexibility of roles. -Students have many opportunities and services.	- The students' mental health has deteriorated over the years. - Mental health is the number one reason for students' drop-out. - Financial pressures restricting optimal provision of services. - Some existing resources not falling in line with current priorities are perceived as being underutilised.	- Need more staff - Need more investment in the building (especially in older blocks).
Divergent sub-categories across DIFFERENT levels of responsibility.	- The high quality of team members. - Some members at senior level were appointed in recent years so change is still happening. - Addressing outstanding financial issues.	- Whilst communication is provided it is not always acted upon by higher levels. - Some members are dissatisfied with some of the changes made, as they feel what was changed worked better for the students.	

Figure 3: Convergent and divergent themes

Results

The findings of this research indicate that there is awareness among the participants of the need for effective student support and student success, and to thereby help them become responsible citizens within their respective local communities. Within the UK institution under study, participants recognise which processes work well and which on the other hand may require further improvement. These aspects are referred to in the next two sections.

(i) Which practices and approaches are perceived as working well?

The range of support services provided is varied and mainly can be categorised into two segments: timetabled support and one-to-one support. Further to what the participants are saying, it is important to note that one-to-one support provision includes wellbeing, career advice, safeguarding, finance, nursing, counselling, educational support, and mental health services, while group support provision focuses on curriculum-embedded personal development sessions and targeted learning support workshops. Participants also described academic support in learning both in and out of the classroom. They see the provision of this mix very important because they believe this meets students' holistic needs across their educational journey.

A convergent theme across ALL interviews was the perceived poor mental health of the student population. The participants feel this is a growing concern since some of the students present themselves at high risk of harm to self or others.

"…With the rising number of students, we are going to have students who are at risk. At risk of harm, hurt and possible death. It happens when someone is feeling suicidal…"

To address this, the institution has a safeguarding team in place which works in a close collaborative system whilst sharing accountability. It is perceived to be fit for purpose. Although it is fluid in its approaches as part of a collective internal and external support network, it leaves no single individual solely bearing the weight of risk and responsibility.

"…It will be our job to gather the context, understand what the worry is and scale it… if we are worried about a student they will have external people involved in their lives as well. It is just a matter of getting the student involved and engaged in the process so that they can reach out… because when the students leave at four o'clock, who is going to keep them safe? WE can't act as an organisation. However, there are external services that contribute .. we work with children services, we work with police, we work with GP's, parents, there is a network…"

"Its taking the appropriate actions, it is a team, it is definitely not one person. There is no risk borne by anybody. It must be. When you are in the middle of a crisis you can miss things… I need a colleague to go "have you thought of…" … we need to sense this and be strategic… because you can miss things ….you want the best for this young person".

Participants also mentioned that the college employed further staff. In fact, a youth worker had recently commenced an internship as part of his own programme of studies and was succeeding in outreaching 'at risk' students and carrying out interventions to support them. They also explained that an occupational therapist had been approached to commence duties the following year to consolidate the ongoing positive college environment.

At operational level within this institution, there appears to be quality collaboration between team members of the same departments, as well as across some (not all) departments. This same collaboration supports same team members when work requirements become increasingly demanding due to increasing student needs and requirements.

"What is working really well I think is collaboration within the curricular areas and with us. So, for example, we have students who study [subject]…and they have support officers who work with them and often they will liaise with us to set appointments for students who are not quite sure what they want to do next. … so I think collaboration works really well and we collaborate with lots of different teams."

"You have to be careful to stay within your boundaries BUT, you'll never find somebody say no sorry I can't help you. Somebody will always do the research … even if we have not got anything to offer a young person, they will do the research to see if there is anything externally that we can help them with or if we can refer them to a different support service …"

Participants also stressed the quality and value of continuous professional development [CPD] they experience within the institution.

"We got pretty regular training… we've got really good core training I think, and relevant and always up-to date with safeguarding. So I think yeh, training is good!"

Training, they said, does not just build skills, but it helps collaboration across departments. It was pointed out that training can be requested voluntarily or agreed with a line manager as part of performance appraisal, and that training in diverse areas was seen to make work allocation more flexible. What has emerged as a positive contributing factor to effectively fulfilling one's role at optimal level for the benefit of the students, is the 'cross training' received either through purposively organised CPD exposures, or through experiences previously acquired whilst working in other educational settings/departments. Such targeted CPD can be either voluntarily requested or negotiated with one's line manager as part of one's individual performance appraisal. This type of CPD has been described as particularly relevant to young new members of staff.

"Well I think at the college, to be honest, they are very good at giving us CPD to learn about things from the perspective of another department. So, although we are [department], we have been able to do CPD from different areas of student support services. Last week we did a well-being one. So, we sort of learnt about different reasons that students might need a referral… they sort of showed us some stats so that we could understand what are the things that are troubling the students most often… I think that cross training is something that is really working well here, because sometimes in your own department you do not always get the full picture. Like you sort of might see that a student is misbehaving but there might be … you know… there's often another reason behind it that another department would have more insight into."

Members confirmed that receiving training in different areas of support services also allows for more flexibility of work distribution.

Proactive student retention interventions within the educational institution are mostly focused on the quality of information passed on to prospective students. Employees assert that the institutional provision of technological support systems allows them to work more efficiently. More specifically, the student profile found as a link within the 'individual learning plan' platform was often referred to. Members have explained that this tool is very helpful since it is used both reactively (example when looking up the profile after a student unexpected interaction) and proactively (example before meeting a referral student) for the benefit of ongoing interactions with students.

"I think what works well is our system of recording. So, when we are preparing for an appointment with a student, we look on their electronic learning programme to see whether they have any learning needs, and strategies for communication and support. We also check whether there is any difficulty on the course or any personal circumstances …"

Furthermore, members stated that the application holds within it, a centralised logging section of each student's evolving self-reflections, as well as all students related institutional interventions/ interactions (through the dialogue section). This centralisation of record-keeping is also beneficial from a quality assurance perspective. On a different note, but still related to IT services, is the provision of learning tools designed to assist students in their academic endeavours.

"We can see when we are preparing to meet them, you know what they have been doing, whether there are any issues, but we also upload our … action plans on there, so that anyone who is working with them, can see what the outcomes of our meetings were. So, it is making sure that everyone who is involved with that student can see all the communications really."

There is a clear commitment amongst participants to student support, student voice and student success.

"Everyone works hard. I haven't got anyone who is… everybody is passionate, very kind and supportive. They go over and above what they need to do."

This is not only evident in the organisational structure but more especially in the manner all participants spoke about their role and responsibility towards students. For most participants, their responsibility to students is not merely to help them succeed academically but also, if not equally, to help them become responsible citizens within their respective local communities.

"When students come to see us we make sure that they know that we've got THEIR best interest at heart…Our aim isn't retention, you know. Our aim is not to keep them at college… it is to help them find a best plan to succeed."

"We try to build our students with some resilience; we try to keep our students safe and reduce any risk of drift."

The studied institution also promotes student voice, with the elected students' union president taking a paid, one-year sabbatical (extendable to two if re-elected), to represent students at senior management level. This role is key to advancing a student-centred agenda, ensuring student views are heard in college matters. The union president also attends Board of Governors meetings, and is backed by a dedicated, full-time union liaison officer who provides ongoing mentoring. Alongside the president, elected student volunteers represent various student groups. However, since they also must attend to their own studies, availability varies during the term, it is not always possible to have union representation constantly available across and within each institution.

(ii) Which practices and approaches are perceived as needing improvement?

Staff shortages were one of the often-mentioned areas for suggested improvement. Participants explained how the lack of human resources was affecting workload and in turn service delivery.

"They have a HUGE workload …whilst they are trying to do their best for every single student, there is not enough of us…this time of year becomes very difficult because we're getting the referrals of students… we could easily be a bigger team."

"All people should have access to a one-to-one appointment, but we have recognised … I think I worked out, we would need ten [staff] in order to do the number of required appointments".

In their opinion, as the college faced budgetary constraints, roles which were linked to funding were given more prominence to those which were not funded. They assert that after a restructuring exercise, some departments were left understaffed. For example, instead of the provision of a one-on-one service, a group service was delivered in the form of a personal development module by a personal development coach. While this filled the academic need, it changed how one-to-one student support worked. This shift has led to fewer and less frequent one-to-one sessions with students. To alleviate the pressure on the coaches, the participants recommend that where possible, personal development coaches specialise in one subject area and rotate among groups to improve subject focus and quality, rather than remain within their own groups. Added to this, there was a further issue related to lack of space. Some of the participants pointed out that there were not enough classrooms to go around to meet rising numbers of students who were admitted on each intake.

As previously indicated, a recurring theme across conversations was poor mental health among students. The participants explained that this is the most pressing challenge which is significantly impacting retention and success rates. This education institution provides a free six-week mental health support programme for students and after six weeks, students are encouraged to seek external mental health services, knowing that given the long national waiting lists, many students are left without timely care. For this reason, extending support to cover a full semester would likely improve outcomes and bolster students' confidence to persist with their studies.

"I think the mental health issues are probably the issues that are challenging us, and the rest of the system and the young people the most… the health system is not great at being speedy in assessing and diagnosing those things. So, we have a lot of young people who are waiting. So, they have got symptoms. They report what they are experiencing but they might not be able to articulate that well. It might show in their behaviours rather than them being aware of it. Then they might just display it in behaviours and we do not always know: is it a deeper underlying illness or is it a mental well-being issue that is potentially temporary? … That is very challenging. I think that is very challenging for us… for the young people, for the parents as well."

Another area of concern was internal communication across the educational institution and not as such within the departments themselves.

"Sometimes it is communication across the college. …. I understand why. An example is last week, we found out that we've got a new customer relations management system to record our interactions with employers, students… you know. I thought I was going to be involved in part of that as one side has got to do with my role … just be involved in the decision or hear about it before. What I heard was "we bought it. We already bought it"".

"I think the communication within our team is excellent. We communicate very well with each other…we have a group email and regardless of whether it has to do with .. you know … if a course is cancelled everybody gets told…because it is just as important to know …".

Participants believed that limited awareness of upcoming changes, a lack of clarity around some staff roles, and inconsistent updates about current developments were all sources of stress. Participants noted that information was often restricted to senior management level and was not always shared openly across teams and campuses. As a result, they recommended a more transparent communication approach, with timely information shared amongst all levels to better support their day-to-day responsibilities.

The participants observed delay in email responses and other communication. They suggested that improving response times could not only enhance workflow efficiency but also ensure better customer and student service. Furthermore, participants mentioned that they experience a difficulty in finding the right mode of communication with students.

"*We do have a big difficulty with young people not checking emails. That is very hard …it is very hard to try and work out how we communicate with young people when all they want is a text message, but you can't write your letter in a text. So, we sometimes text them to say that we will sent you an email. But still."*

"I know that other colleges also struggle [to reach students]. I went to a [subject] conference … and there were a hundred delegates there from different colleges and everyone was saying the same thing. It is very hard to know how to communicate with this generation because they just want a text message."

The overall findings show that there is a strong commitment amongst the participants of this study towards student support and student success. While strengths like embedded student voice at governance level, sense of professionalism and positive outlook, and effective use of technology were identified and observed, other human, financial and interpersonal limitations remain.

Discussion

In keeping with eco-systemic perspectives on student success (Bronfenbrenner, 1979; Ungar, 2021), three interrelated levels appear to shape effectiveness. We look at support through three lenses: what we offer students (services), who delivers it (people), and the conditions that shape how it all runs (organisation). In our data, these layers are mutually constitutive: strong staff commitment and skills are amplified by clear governance, skilled resources, and usable information systems; conversely, staff shortages or lack of resources can stand in the way of internal communications. This alignment (or misalignment) across layers is a recurrent theme in student engagement research (Kahu, 2013).

A central finding in this research is the formal embedding of the student voice in institutional governance, specifically, an elected Students' Union President (SUP) with a paid sabbatical who participates in senior decision-making, supported by a liaison officer and peer representatives. The structural inclusion of student representation at board level indicates a move beyond mere student consultation towards co-creation (Healey, Flint & Harrington, 2014). The participants' emphasis on collaboration across services and the SUP's link into governance reveal importance being assigned to structured student participation in quality processes (Gaebel, Zhang and Stoeber 2024; ENQA, 2024) and the creation of student-centred ecosystems (Thornhill, 2016). Gravitating against this is uncertainty about roles after restructurings, and uneven dissemination of decisions across campuses. Such friction risks relegating student voice to a symbolic function, unless paired with transparent change management and effective communication across departments.

Students' mental health emerged consistently in the data, with unmanaged stress and anxiety linked to disinterest and subsequent early school dropout. Because of this, it is important that the educational institution works collectively to support students' wellbeing across curriculum design, assessment, scheduling, teaching and learning. A useful policy parallel is the trajectory of Think Ahead, the national fast-track route into mental health social work. The Think Ahead programme launched with the University of York as academic partner, with curriculum input from the University of Central Lancashire, before the academic partnership transferred to Middlesex University, which hosted the Summer Institute from 2019 onwards. In April 2025, the Department of Health and Social Care confirmed it would not fund cohorts beyond 2025, with sector reporting indicating an orderly wind-down to 2027. Read as a whole, this shows that gains in mental-health outcomes depend on coherent academic–service partnerships and the provision of adequate resources including stable resourcing (Think Ahead, 2024).

The participants also described "huge workloads," but balanced this against strong intra-team solidarity, professionalism, and "going above and beyond," supported by CPD and cross-training. However, goodwill can buffer shortfalls temporarily but cannot sustainably substitute for long term shortages in staffing and space. Indeed, the quality of student support is influenced by staff-to-student ratios, caseload design, and protected time for reflective practice and supervision, particularly in safeguarding- and trauma-exposed roles.

To this end, the data further suggests that role design matters. Participants proposed specialising personal development coaches by subject area and rotating them across groups to preserve depth and prevent over-extension. This resonates with evidence that clear roles and specialised responsibilities improve quality of referrals, reduce duplication, and optimise scarce expertise (Kuh, 2008; Healey et al., 2019).

Universal Design for Learning (UDL) is essential for effective student care because it moves focus from reactive fixes to preemptive curriculum design. By offering multiple ways to engage with content, demonstrating understanding and learning, and accessing support, UDL reduces the cognitive load that often increases stress for students with different needs. In practice, this means redesigning assessment deadlines to prevent overload, offering flexible formats and clear rubrics, including study-skills into modules, and ensuring digital and physical environments are accessible to all learners. In parallel, integrated, student-centred records facilitate timely, coordinated responses, particularly across multi-campus institutions where students may interact with several teams (Kuh, 2008; Thomas, 2012).

An operational issue raised by the participants was space scarcity and the uneven modernisation of buildings, both of which affect learning conditions and environments. The literature on belonging emphasises the physical space of the student experience, the ways in which accessible, welcoming, and well-resourced spaces communicate care and legitimacy (Thomas, 2012). Participants' observations of some overpacked offices and differential modernisation therefore connect directly to wellbeing and possible engagement. Strategic capital investment in the least resourced blocks, timed to align with periods of high demand (e.g., enrolment, assessment), is indicated.

Limitations

The study's main limitation is that data was collected while some key staff were on annual leave, which may have narrowed what could be gathered. Also, as a single case study, the findings are not generalisable. Even so, there are transferable insights about effective student support that may prove useful for researchers and practitioners.

Conclusions

The study sets out to understand how managers, administrators, and academics perceive the effectiveness of student support services within a UK further and higher education institution. The findings show that this educational institution possesses many key components linked to student success and a student-centred ecosystem, including a robust student voice in governance, skilled and values-driven staff, and an information system that supports timely and coordinated student support interventions.

The focus moving forward is to consolidate existing interventions into more coordinated and consistent practices by: (i) resourcing pressure points, particularly mental health and coaching; (ii) extending and embedding preventative, UDL-aligned designs across teaching and assessment; and (iii) instituting clear, timely, two-way communication across departments and with students. Doing so will not only recognise and address lived realities shared by participants in this study, but also connect institutional practice with increased student engagement, retention and wellbeing.

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Conflict of Interest

No conflict of interest is present.

Authorship

Dr Rosetta Thornhill – 50%
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09 Learners' Perspectives of Inclusive Practices of a Public Higher Vocational Education Provider in Malta.

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Abstract

Objectives: This study explores learners' perspectives on the development and implementation of inclusive education practices (and their contribution to meaningful learning) that support both academic success and learners' well-being within a public higher vocational education institution in Malta.

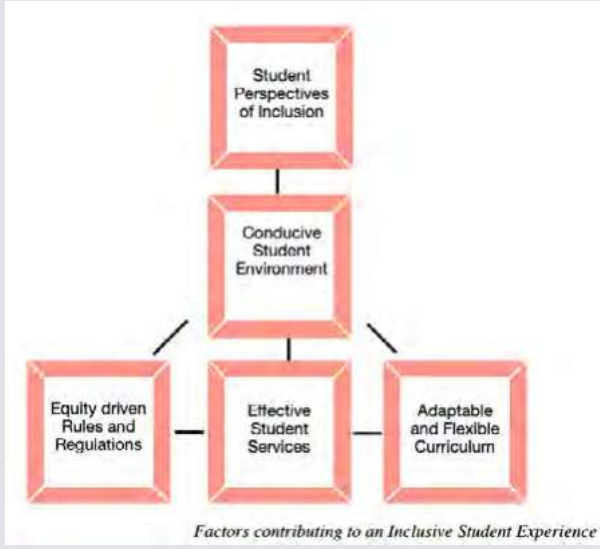
Methods: This study employs mixed-methods research methodology. Data was collected through a survey and a subsequent semi-structured focus group. The survey was distributed to 631 students through the gatekeeper of the institution. The survey explored the key challenges that learners believe they face in their studies and the impact they believe they have on their sense of well-being. Participants for the focus group were selected through purposive sampling by approaching students who were at risk of academic failure since they were not meeting expected academic targets. The focus group discussions explored learners' academic experiences, with particular attention to how included and valued they felt within the institution. Drawing on both the medical model and social equity models of inclusion, the discussions centred on students' voices, highlighting their perceptions of belonging, participation, and support within the academic environment. By using a mixed-methods approach, the study brings together measurable evidence and the actual students lived experiences, thus offering a holistic understanding of how inclusive education practices within the educational institution impact students' learning experiences and overall well-being.

Results: Whilst some of the participants of the study are happy with their learning journey, others claim that the educational system that they are experiencing, is not inclusive. The latter participants believe that they still need to rigidly 'fit' into a provided educational structure and they feel that this context impacts their sense of well-being. The participants would like a greater say in identifying barriers and opportunities, with implications for policy refinement, curriculum adaptation, and the enhancement of learner support services to create more authentic and inclusive institutional education environment.

Conclusion: While legislative and strategic initiatives underlie Malta's commitment to fostering inclusive, equitable learning environments, persistent gaps remain between policy aspirations and lived realities, often influenced by systemic resource constraints and deficit-based views of learner diversity.

Keywords: "Inclusive Education"; "Maltese Higher Vocational Education"; "Learners' Voice"; "Well-being".

Highlight:
The applicability of the study lies in its focus on learners' perspectives as direct service users. It offers an empirical exploration of their sense of belonging within the institution and their perspectives of educational inclusion.



Graphical Abstract

Introduction

This article explores the development of inclusive education within the public higher vocational education [HVE] sector in Malta and its perceived effect on learners' well-being. Traditionally, vocational education training in Malta was mainly sought after by students who were not drawn to academic routes, either because they failed academically in compulsory education, or because they viewed a vocational route as their preferred career pathway (Spiteri and Degiovanni, 2010).

One of the more prominent changes within the educational sector has been the introduction of a selection of vocational subjects within secondary schools, an initiative which took place in 2011. These subjects included Engineering, Health & Social Care, Beauty, IT, Hospitality and Tourism. By 2013, these subjects were fully integrated into the national curriculum.

Despite these initiatives, the gap between policy and practice remains pronounced, implying that the goal of achieving inclusive education within the vocational sector is an ongoing process that merits further attention (Ainscow, Booth, and Dyson 2006 and Pereira et al., 2016). The focus on a vocational education entity, stems from the authors' knowledge that many students who choose vocational routes in Malta tend to do so after experiencing challenges or disengagement with traditional academic pathways. This pattern is reflected in international contexts, where students who feel they are not performing optimally in academic settings may opt for vocational pathways. However, this trend is not universal, as factors such as previous schooling, cultural values, upbringing, and peer influences can also influence career decisions and destinations (Lessard-Phillips, Brinbaum & Heath, 2014). This reveals the importance of vocational institutions having the autonomy to make learner-centred decisions—such as staffing, curriculum adaptation, and resource allocation—as noted by Cedefop (2023). Such autonomy enables these institutions to implement inclusive practices effectively. Without this flexibility, policies risk being aspirational rather than practical, potentially failing to address learners' real needs and leaving them underprepared for HVE.

From a person-environment fit model perspective (Redelinghuys, 2023), a misalignment between the individual and the educational environment can prove stressful to learners. This is why positive leadership, collaborative cultures, and dispositions which aim to maintain inclusive practices and enable learners to align with their own needs and expectations are influential in fostering a positive educational experience for learners (Ainscow and Sandill, 2010). If this were not to be the case, learners would be at risk that they will either 'fail' the system, or the system will fail them, as manifested when students drop out of HVE prematurely (Braunstein, Deutscher & Seifried, 2024). For this reason, it is important that the provided educational system moves beyond tolerance and provides genuine and effective learning experiences that cater for all learners while recognising that learners' well-being is a highly individual experience.. Wang and Degol (2016), believe that the institutional context is another consideration that can influence learner well-being. In line with this perspective, Booth and Ainscow (2016) discuss the importance of developing inclusive frameworks that position learners as active participants in shaping their educational journeys. Recognising the significant role inclusivity plays in shaping learners' experiences, this study is guided by the central research question: *How do learners perceive inclusivity in further and HVE in Malta, and how do these perceptions influence their well-being?*

Exploring learners' perspectives gives important insights into how they feel about the institutions' efforts and shows where there may be gaps between policy goals and their experiences in HVE. Analysing the perspectives of learners in this manner helps identify areas where they believe resources, support structures, curricula or pedagogical approaches may be lacking or ineffective. By focusing on the voices of learners, this research seeks to promote holistic inclusive education practices that enable meaningful participation and equity for all learners and that enhance their well-being.

Literature Review

While learners' viewpoints express subjective interpretations, it is essential to relate these to established theoretical frameworks. The Social Equity Model (SEM) and the Medical Model (MM) align closely with the principles of inclusive education and, as such, offer a theoretical lens through which to assess whether the approach applied in HVE is likely to foster a sense of inclusion and well-being.

The MM frames learners' differences as a problem located within the individual. In contrast the SEM frames learners' differences as a problem which needs to be approached by institutions, taking on board the wider contextual factors that can influence student sense of well-being and academic participation in educational settings. Graham (2020) explains that the MM may exclude learners, either by separating learners from the mainstream or by denying them access to specialized resources when schools cannot offer them. This type of exclusion can push learners aside and worsen social and economic inequalities (Armstrong, 2017). Environments shaped by the MM, often interpret non-normative behaviour as deviant and may consequently foster the disengagement, resistance, or withdrawal of learners (Ainscow, 2020).

Contrastingly, the SEM advocates for the adoption of a genuinely inclusive educational environment that recognizes and values the diversity of learners' cultural backgrounds, experiences, and abilities. From this perspective, manifestations of diversity are viewed not as challenges to be managed, but as aspects that enrich learning communities (Florian, 2014; Slee, 2011 and 2018). These manifestations are seen as integral to shaping learning dispositions, interpretive frameworks, and identities (Booth & Ainscow, 2016). When educational practices are relational as advocated by the SEM, learners are more likely to experience a sense of belonging, which in turn fosters positive engagement, intrinsic motivation, and inclusive participation (Geertsema, Huijser & Sheffield, 2024).

A key factor that is central to creating such inclusive environments is the quality of the relationship between educators and learners. Trust, empathy, and mutual respect are foundational elements that support inclusive pedagogy, particularly in diverse classrooms (Niemi, 2021; Taff and Clifton, 2022). The HVE sector would be particularly well-positioned to nurture these relationships if it enables personalised teaching approaches that align with SEM principles. On the contrary, in cases where institutional cultures are shaped by medical models or utilitarian logics, which promote deficit-based frameworks or value learners primarily for their employability, authentic inclusion is at risk of being undermined (Allan, 2016; Norwich, 2022).

Indeed, in contexts of the latter type, the use of labels such as "underachievers" or "least likely to succeed" which can inhibit effective relationship formation, can compound marginalisation and heighten learners' risk of academic failure (Bajada, Callus, & Borg, 2021). Educators are thus encouraged to move beyond any surface-level assumptions they may have and engage with the learners' broader social and emotional context to avoid this. By moving away from labels and focusing on what learners can do, they would be more likely to foster genuinely inclusive educational experiences. Educators are constantly called to critically reflect on how their teaching methods either promote or inhibit relationship building and active involvement (Devlin & Samarawickrema, 2022).

Bovill (2020) points out that learning works best when people communicate effectively, showing that active emotional engagement within meaningful social contexts is essential for learners' well-being. When learners fail to perceive meaningful engagement within their learning environments, they may respond through behaviours of withdrawal, including truancy (Cortés et al. (2022). Of particular concern is "truancy in mind" (TIM), where learners physically attend classes but are mentally disengaged, an often-overlooked phenomenon in HE (Farrugia, 2017). TIM can be especially challenging to detect, as it may occur even among those presumed to be successful learners. The use of interactive, learner-centred teaching methods offers educators critical opportunities to identify these subtle signs of disengagement and intervene appropriately, either through direct pedagogical adjustments or referrals to support services, thereby promoting learners' well-being (Bergdahl, Nouri, and Järvelä (2021). Yet, effective intervention is contingent upon the availability of adequately trained lecturers and comprehensive institutional support.

Methodology

This study adopts an interpretivist paradigm using a mixed-methods approach. The data for this research was collected through the administration of a survey followed by a focus group. The survey explored the key challenges that learners perceive as influencing their studies, as well as their impact on their well-being. The questions presented by means of this survey, were both of an open ended and closed ended format in order to optimise data gathering. The survey was distributed to the whole student population through the gatekeeper of the educational institution. It consisted of three sections. The first section comprised of demographic questions, the second section addressed questions relating to student satisfaction, participation, and perceived academic challenges; and the third section presented questions aimed at eliciting possible improvements.

Forty-seven learners participated in the survey, representing approximately 7% of the 631 targeted respondents. Despite the modest response rate, the data obtained from the participants provides valuable insights, particularly when interpreted alongside the qualitative data generated through the subsequent focus group.

Sixteen learners participated in the focus group, and this was conducted after the survey, allowing for a further elaboration of the data emerging from the survey. Indeed, the focus group served to foster interactive dialogue and to explore different perspectives - an essential quality when investigating complex social phenomena (Roulston, 2018). The focus group comprised learners who were purposively selected by the college administration which believed that the learners were at risk of academic failure based on their not meeting expected academic targets. Whilst the focus on a specific subgroup carries some risk of bias, this was mitigated by the participants' varied social, cultural and academic backgrounds.

The central scope of the focus group was to promote an understanding of the participants' perceived engagement with the institution and their perceptions of the educational system. These learners shared their views on issues negatively influencing their studies, highlighting potential systemic challenges. This gave the possibility to emphasise the subjective meanings and perspectives of learners (Ross, 2017). The focus group was facilitated by the authors, both working within the local HE sector. This exposure to HE facilitated the establishment of trust and rapport with the participants (Bulk and Collins, 2024). Furthermore, since one of the researchers is a female and the other is a male, it introduced a complementary interpersonal gender dynamics that supported more inclusive discourse during the data collection and analysis phase (Lingard et al., 2008). Additionally, the focus group discussion was guided by semi-structured questions designed to probe learners' experiences and attitudes related to inclusion, teaching methods, and institutional support. Participants were provided with clear, written information about the study's purpose, voluntary participation, and data confidentiality, ensuring informed consent without coercion (Wiles et al., 2008).

The data was analysed using Braun and Clarke's six-step framework (2006) of thematic analysis. First, the researchers familiarised themselves with the data and identified key patterns and emerging themes. Second, initial codes were generated to label recurring ideas, challenges, and coping strategies. Third, these codes were grouped into broader themes to enable a more detailed analysis to take place as illustrated in the table below. Following this, the themes were reviewed to ensure they accurately reflect learners' experiences and are consistent with the research objectives. Then each theme was clearly defined and labelled, considering the different perspectives raised by the participants of the study (Table 1). Finally, the themes were linked back to the research question to interpret and conceptualize students' perceptions.

Tutor Support & Belonging	- Unequal treatment - Inconsistent supervision - Lack of academic inclusion	"Lectures do not give enough attention to certain students." "Tutors who have issues with certain students make their lives miserable." "Lecturers are not trained enough."
Professional Inclusion/ Exclusion	- Exclusion from job progression - Devaluation of qualifications - No sectoral protection	"Why should I remain in school if I don't get promoted like ACCA students?" "We have no union to back us up." "We're studying for a qualification but then go out and see foreigners working in jeans."
Psychosocial Exclusion	- Emotional frustration - Lack of confidence in system	"Why should it be made so hard for us to progress in learning?" "We go to ask the persons above and they do not know what to do."

Table 1: An excerpt of codes and themes elicited from the focus group

In examining both datasets, the focus was on participants' perspectives on institutional and pedagogical practices that facilitate or hinder inclusion, engagement, and overall well-being in HVE. In both the survey and the focus group, ethical considerations were prioritised. As previously indicated the survey was distributed by the gatekeeper, whilst the participants of the focus group were selected by the administration.

Results

The results from the survey show that 47% (n=22 out of 47) of respondents are satisfied with their academic journey with another 25.5% (n=12 out of 47) of respondents, claiming that they are extremely satisfied with their academic journey. This is further reflected with 77% (n=36 out of 47) of respondents stating that they are proud to be part of the institution (Figure 1).

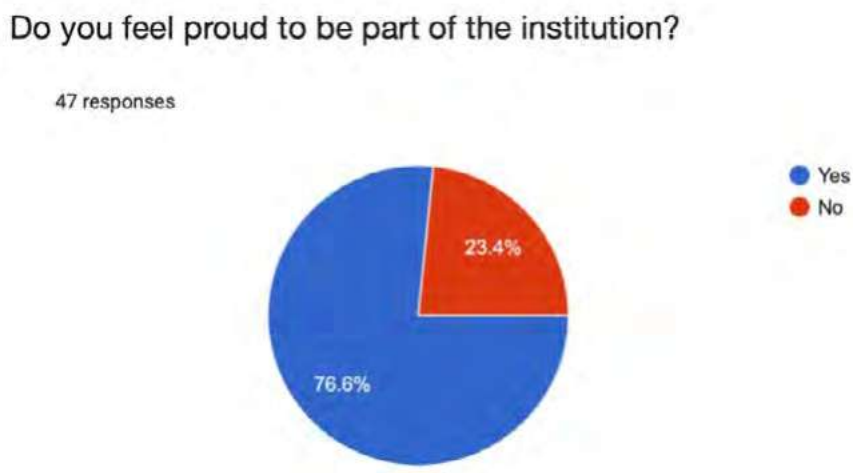


Figure 1: Pride in the Institution

"On a personal basis I enjoy every minute in the Institute as there is a very positive vibe among us the students and the relation with the lecturers who without compromising their role in class are very friendly , always ready to help, flexible and understanding. In other words, they try everything they can so that we can succeed in our studies".

"In the case of my course, lecturers have been very supportive both on one-to-one basis and even on a group level. Some lectures have very good skills in motivating us and helping us believe in our ability to succeed."

However, only 44% (n=21 out of 47) of respondents say that the institution provides a positive learning environment with 17% (n=8 out of 47) claiming the institution does not provide a positive environment and with 38% (n=18 out of 47) claiming the institution 'sometimes' provides a positive environment. These findings were complemented by feedback obtained from the focus group wherein the learners felt that when they raised concerns with suggested solutions, these were not always acted upon. This potentially implies that students sometimes believe that they are not seen as partners in education. This feeling is however counterbalanced when compared with their overall perception about the learning that they derive from attending the institution.

Students acknowledge the provision of a range of institutional support services. 70% (33) of survey respondents feel that the services provided reflect the needs of the students, while 49% (23) of survey respondents feel that the services are accessible. This indicates a gap between what is offered by the educational institution and how students perceive the services and their accessibility to them. The students report that support services are important since they feel supported and do not feel isolated when addressing any arising challenges.

Aristovnik et al., (2020) argue that lack of access to services disproportionately affects socio-economically disadvantaged learners, who need to balance education, work, and personal responsibilities, thus exacerbating educational inequities. This implies a critical need for learners to have clear and flexible access to staff and resources. This was also evidenced in this study as 34% (16) of respondents claim that they need additional support to help them succeed academically since they feel that they are not always coping with their studies. In fact, only 13% (6) of survey respondents claim that they always cope with their studies. It follows that some of these respondents may be particularly disadvantaged since they may have to bear the brunt of not finding the help they need within the institution to help them succeed in their studies. This has to be balanced against the overall support that students find, including peer support, informal support and the rapport that some students build with their respective lecturers.

Within the focus group, two major thematic areas, namely, institutional barriers to inclusion, and the critical role of pedagogical approaches in fostering learners' inclusion and engagement, emerged from the data.

(i) Institutional Barriers to Inclusion

Learners explain that structural, procedural and interpersonal obstacles within HVE deeply impede their sense of belonging, well-being, and academic success. Central among these obstacles is the perceived inflexibility, and the lack of responsiveness of members of the HVE institution to students. Participants claim that there is inflexibility also in course scheduling and delivery formats. More specifically, participants describe how the 'rigid' timetables clash with their familial and work-life responsibilities.

"*Offer flexible timetables to allow us time to work and timetables that make sense to travel once from school to work not back and forth because we have 4 hrs free"*

Additionally, participants view institutional rules and regulations (such as mandatory attendance and rigid curriculum content and requirements [inclusive of assessment modes]), as further obstacles to their learning.

"… mandatory internships should reflect the chosen area of study, if they are mandatory, it's up to ITS to find the job for the student [and not up to the student]"

"… Listen to our problems and tell the teachers not to overwhelm the students with presentations and assignments every week!"

This sense of misalignment between institutional structures and the lived experiences of the learners creates a perception that the educational system is not designed to meet learners' needs.

"By honestly considering students' and lecturers' suggestions for improving modules/courses without bureaucracy."

"Be more inclusive and less unwanted comments passed around".

In fact, several focus group participants claim that they make personal sacrifices, such as missing out on paid work or family time, and that this situation leads to increased stress, frustration, and disengagement. They believe that these sacrifices are unappreciated, particularly when staff members seem unsupportive and do not show empathy to the students' plights.

"Personally, every time I approached [some] departments, not all but specifically [a department], it has been a rude and horrible experience! I was told to go complain about my problems to the minister if need be. Absolutely rude and uncalled for. Members in other departments are nice although the new person from [same department] sounds very sweet and helpful, but no positivity when it comes from [same department] last year. The fact that so many students left because they were not supported or helped during difficult times is very sad. Hopefully this year will be treated with more respect and are listened to."

"… [the institution] is safe, some lecturers are amazing and will give advice and listen to you, however also most of them have no clue if they are supposed to do something or not probably in fear of politics in the workplace"

The participants claim that mental health struggles, financial hardships, and social pressures are not given due attention by the existing support framework.

"… every year, every class and every student have a different situation, you can't put us in the same sleeve. Stipend comes in the middle of the month not in the end, students are working for a whole month [and] get a big pay and won't last till the end [of the month]. So at least in the beginning of the month get work pay and then after 2 weeks get stipend and it will be a cycle …"

"Particularly this year, it seemed that several lecturers, in different areas of teaching, are unhappy, and when lecturers are frustrated/feeling unheard/considering leaving, it is hard for me to stay positive at school and feel like I'm not wasting my time studying."

Learners attribute these limitations to lack of resources and inadequate planning within the institution. They find the effects of these limitations further enhancing their reduced sense of well-being. This aspect is also reflected in the survey results (Table 2), indicating the following ranking of responses:

Ranking of responses	% of respondents
response rate for anxiety and stress	43%
response rate for irritability	30%
response rate for low self-esteem	30%
response rate for poor concentration	30%
response rate for depression	23%
loneliness	23%
insomnia	21%

Table 2: Participants' perceived well-being.

This suggests that survey respondents may be experiencing issues that negatively affect their well-being. Data emerging from the focus revealed that there is a strong awareness among students of the impact of stressors, with 98% agreeing that general well-being is important for academic success.

(ii) The Critical Role of Pedagogical Approaches in Fostering inclusion and engagement

Participants observe that the style and methods of teaching significantly shape their motivation, engagement, and overall learning experience. Many participants express a strong preference for active, learner-centred pedagogies that position them as collaborators in the learning process (rather than passive recipients of information). This approach, which encourages inquiry, discussion, and practical application, also fosters a sense of ownership over their acquisition of skills and knowledge. Such facilitative pedagogies create a classroom environment characterised by mutual respect and trust. The opportunity to actively engage in meaningful dialogue also helps learners develop critical thinking skills.

Contrastingly, when lecturers rely on traditional, lecture-based teaching methods, learners are less likely to take interest in what is being taught. A chalk and talk approach, characterised by one-way information delivery and minimal interaction, is associated with the generation of feelings of detachment.

"teaching methods should improve to include more discussions in the classroom".

One of the participants describes situations where learners are physically present in class but mentally absent. Other participants note that the monotony of passive listening leads their attention to wander, negatively impacting their ability to absorb material and participate meaningfully.

"You can tell who is passionate or who is here just for the sake of it. If we finish assignments, what is the point of continuing with lessons? Teachers don't help us in remaining motivated when they say that we are coming for nothing .."

In addition to the above pedagogical challenges, structural disadvantages further impede learners' ability to engage fully with their education. A significant barrier to learning identified is the perceived limited access to key digital resources. This shortfall is particularly salient in the post-pandemic educational context, where digital resources have become indispensable for flexible, remote, and hybrid learning modes (Nicolaou, 2023). Participants believe that this digital divide creates an additional layer of exclusion, especially in an era where digital tools are becoming increasingly central to research and education.

Discussion

While most respondents express pride in attending the institution, their strong emphasis on well-being infers that learning extends beyond intellectual engagement to encompass students' emotional and psychological experiences within the HVE context. This aligns with Biesta's (2023) assertion that education should promote not only knowledge acquisition but also the holistic development of learners, including their sense of identity and well-being. Therefore, when exploring how learners perceive inclusivity in further and HVE in Malta, and how do these perceptions influence their well-being, which is the research question guiding this study, the analysis attends to both academic provision and the wider ecology of care—timetabling, assessment practices, accessibility, relationships with staff and peers—to show where inclusive intent translates into inclusive experience, and where it falls short.

As a case in point, participants reported multiple institutional barriers, including inflexible scheduling, rigid policies, and limited staff support, which likely hinder their academic progress and diminish their sense of inclusion (Mifsud, 2024 and Thornhill, 2016). The inadequate provision of accessible support services addressing mental health, financial hardship, and social challenges leaves many students to manage difficulties independently (Nasr et al., 2024). This suggests an implicit expectation for students to adapt to systemic constraints, with those unable to do so facing an increased risk of disengagement or withdrawal (Mifsud 2024 and Thornhill 2016). The concerns which students expressed about these barriers, were also accompanied by an appreciation of the factors that enable them to pursue their studies successfully which included finding encouragement and support whilst studying and being able to outreach to certain staff when they believed this was merited.

The participants' preference for critical, learner-centred pedagogies that promote active involvement and meaningful support within the classroom reflects a desire for inclusive education (Biesta, 2023). As one participant noted, "When lecturers discuss things with us and let us explore ideas, I feel more involved and willing to participate. It's not just listening; it's about being part of the class."

These perspectives reveal the importance of pedagogical approaches that foster active knowledge construction. From the viewpoint of contemporary social equity models of inclusion, learners recognise how the learning environment can either facilitate or restrict their holistic development (Slee, 2011 and 2018). This contrasts with the medical model, which applies prescriptive teaching methods and places responsibility for academic struggles primarily on individual learners. Consequently, adopting inclusive pedagogies alongside expanded support services is essential to enhance student well-being and success (Bovill, 2020).

Such a shift requires moving beyond deficit-based frameworks towards holistic, participatory educational models that acknowledge and respond to diverse learner needs (Biesta, 2023). The pride and achievement reported by some of the students stems from positive interactions with teaching staff and effectiveness of use of existing support services. While the institution appears to align with the social equity model by responding to student needs, this study also highlights the importance of deepening student voice in institutional decision-making and practice.

Limitations

The study is small-scale research implying that the findings are not necessarily generalisable to larger learner populations. Additionally, the study was conducted during a specific period and if it were to be repeated, the results may change due to the influence of factors such as a different population of learners, and changes in institutional dynamics. It is also possible that during the focus group, while some participants spoke up, others did not express themselves as readily thus resulting in 'left out' data.

Conclusions

Overall, the findings of this empirical study reveal varied perspectives. Some of the participants frame the education institution in the light of their positive experiences. Others, however, highlighted critical areas they perceive as needing improvement, notably, the need for more learner-centred pedagogies and the need for enhanced availability of student support services. Nonetheless, participants identify recurrent challenges, including institutional rigidity, insufficient infrastructure and some outdated pedagogical approaches. These challenges not only impede learners' academic progress but also contribute to negatively impacting their sense of well-being. This implies that HVE institutions should ideally actively engage learners in co-creating their educational experiences. The institution should approach this by demonstrating genuine responsiveness to learners' feedback, thereby encouraging greater institutional flexibility. Ultimately, this cultural shift would not only support more personalised learning (whilst providing learners with enhanced opportunities for academic, professional success) but would also in agreement with Booth and Ainscow (2016), fix educational systems and practices in the process.

Further research should explore how in practical terms, active student participation can be effectively embedded into institutional decision-making frameworks. Additionally, incorporating perspectives from other stakeholders—such as lecturers and administrators—would offer a more comprehensive understanding of the complex factors influencing learner inclusion and success.

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Authorship

Dr Rosetta Thornhill – 50%
Dr Damian Spiteri – 50%

Conflict of Interest

No conflict of interest is present.

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10 Transgender Adults' Perceptions of Residential Long-Term Care in Malta: Implications for Inclusive Practice.

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Abstract

Aims of the Study: This study explores how transgender adults' life experiences inform perceptions of residential long-term care (LTC) in Malta—ongoing residential support for daily living and health needs—and identifies conditions that foster well-being and inclusive, affirming practice. It also considers the influence of compounded stigma and discrimination in residential settings, which is often heightened by age and disability.

Methodology: The study used a qualitative phenomenological design. Semi-structured interviews were conducted between September and November 2024. Data were analysed using Interpretative Phenomenological Analysis (IPA) with an idiographic, double-hermeneutic focus; the interpretation was sensitised by the Intersectionality Research for Transgender Health Justice (IRTHJ) framework and structural injustice theory. Seven transgender adults living in Malta—a mix of community members with varied backgrounds—were interviewed. They had different occupational backgrounds and identified as transgender. All participants were 18+.

Key Findings: Three superordinate experiential themes were developed: (1) Fear of Discrimination, Misgendering, and the Loss of Identity; (2) A Vision for Affirming and Inclusive Trans-Ageing Care; and (3) Building Inclusive Futures: Education, Awareness, and Social Change.

Conclusion and Recommendations: Transgender adults approach residential LTC with justified concerns about safety and identity erosion. Dignity and quality of life can be improved through targeted staff training, clear organisational policies, and routine affirming practices. Embedding an IRTHJ-informed, intersectional framework is recommended to address structural barriers, not merely individual attitudes.

Keywords: "Transgender"; "LGBT"; "old age"; "long-term care"; "experiences"

Key Theme	Definition	Supporting Quote
Fear of Discrimination, Misgendering, and the Loss of Identity	Perceived barriers and concerns expressed by the participants regarding residential care include factors that could hinder their ability to receive inclusive care, contributing to their reluctance to seek care in the future.	*"If I need to be in a home, I would encounter people who are supposed to take care of me, but don't...My fear is that, I will lose control over myself, over my decisions. That someone else will dictate to me, at eighty years old, how I should live." (Participant 2, Age 35, Transgender male)*
A Vision for Affirming and Inclusive Trans-Aging Care	The specific services, resources, and social environment necessary to support inclusion, well-being, and a high quality of life for transgender individuals in residential care.	*"I think, there should be more support, like specialised healthcare professionals in transgender care who can follow us. Because, if this isn't done, the person feels like they're not being treated properly." (Participant 6, Age 60, Transgender female)*
Building Inclusive Futures: Education, Awareness, and Social Change	A continuous effort to foster equity and dignity by raising awareness, challenging prejudice, and reforming systems to support transgender older adults.	*"If staff were educated properly, really educated about who we are, maybe we wouldn't have to fear being ourselves in care homes. Change has to start with awareness, otherwise we'll keep being invisible." (Participant 4, Age 23, Transgender male)*

Graphical Abstract - Key Themes with Definitions and Supporting Quotes

Highlights:

- Amplifies transgender voices on concerns and needs in residential care for older adults.
- Informs inclusive policies to improve care quality and cultural competence.
- Promotes equity and awareness by addressing stigma and access barriers.
- Improves well-being by reducing neglect, isolation, and health disparities.

Abbreviations:

ARC - Allied Rainbow Communities
GIGESC - Gender Identity, Gender Expression, and Sex Characteristics Act
IPA - Interpretative Phenomenological Analysis
IRTHJ - Intersectionality Research for Transgender Health Justice
LGBTQ+ - Lesbian, Gay, Bisexual, Transgender, Queer, Questioning
LTC - Long-Term Care
MGRM - Malta LGBTIQ Rights Movement

Introduction

Background

Consistent with global trends, Malta's population is ageing, driven by gains in life expectancy and the ageing of the post-war baby-boom cohort (U.S. Census Bureau, 2022). Life expectancy stands at 83.06 years (The World Bank Group, 2023), and many older adults report good health (Azzopardi Muscat et al., 2017). Nevertheless, ageing is often accompanied by chronic illness, frailty, and dementia, increasing demand for residential long-term care (LTC) (Kingston et al., 2018). In this paper, LTC refers to ongoing assistance with activities of daily living, personal care, and health-related support provided over extended periods in residential facilities and comparable settings.

In parallel, the visibility of transgender people is increasing; estimates place transgender adults at approximately 0.3–0.5% of the population—a figure likely to rise as rights protections and public awareness improve (Ministry for Equality, Research and Innovation, 2022). Accordingly, residential care providers in Malta can expect to encounter a growing number of transgender residents over time.

Research Question and Objectives

The research question underlying this study is: How do transgender people in Malta perceive the prospect of living in residential care homes? Rather than testing a formal hypothesis, this study adopts an exploratory approach that seeks to understand the perspectives and lived experiences of transgender individuals. It examines their concerns, reasons for choosing or avoiding such care, and their future needs as they age. As one of the first qualitative studies on transgender ageing in Malta, it aims to help care providers, health managers, and policymakers create more inclusive, person-centred services. Within LTC, transgender older adults encounter distinct challenges shaped by the intersection of age, gender identity, socioeconomic position, and age-related health conditions (Fredriksen-Goldsen et al., 2014). In many care systems, institutional cisnormativity—treating sex/gender as binary and congruent—undermines respectful, affirming care. Where residential homes operate under cisnormative logics, the policies, practices, and environments needed to support transgender elders' physical, emotional, and social well-being are often absent (Eliason, Dibble, & De Joseph, 2010; Sharek et al., 2015). As a result, ageing services must be culturally competent, inclusive, and responsive to diverse identities and life courses.

This concern is acute in Malta and comparable contexts, where LTC facilities frequently reflect hetero-cis-normative assumptions: chosen families may go unrecognised, and basic accommodations—such as access to private rooms, privacy-preserving personal care, and reliable gender-affirming routines—remain limited. In line with recommendations by Cahill et al. (2002) and Orel (2017), inclusive physical and social environments that guarantee privacy and dignity are indicated. In the present IPA study, these structural conditions formed the contextual backdrop against which participants' meaning making about residential care was interpreted. By examining how intersecting identities—such as gender, age, and disability—interact with systemic barriers in residential care (Witten, 2014; Wesp et al., 2019), the study contributes to global efforts to ensure fair, dignified, and respectful care for all older adults.

Literature Review

As awareness of diversity expands, the needs of transgender older adults—particularly in LTC settings—are increasingly acknowledged, yet remain under-researched (Fredriksen-Goldsen et al., 2014). Although some non-Western cultures historically embraced gender diversity (Miller & Nichols, 2012), Europe—and Malta in particular—has enforced rigid gender norms through religious and sociopolitical mechanisms (Vella, 2019; Koken et al., 2009; James et al., 2024).

Malta's progressive Lesbian, Gay, Bisexual, Transgender, Queer, Questioning (LGBTQ+) legislation (Leġiżlazzjoni Malta, 2014; Ministry for Active Ageing – Malta, 2022), along with the World Health Organization's 2019 reclassification of "gender incongruence" as no longer being a mental disorder (WHO, 2024), has helped promote the provision of gender-affirming care.

Nevertheless, older transgender adults around the world continue to face significant barriers to disclosure and treatment (Dear, 2023). These challenges are particularly acute in LTC settings, where fear of discrimination often discourages individuals from disclosing their gender identity, thereby rendering access to safe and equitable care less likely (Ministry for European Affairs and Equality – Malta, 2018, 2022; Zammit, 2022).

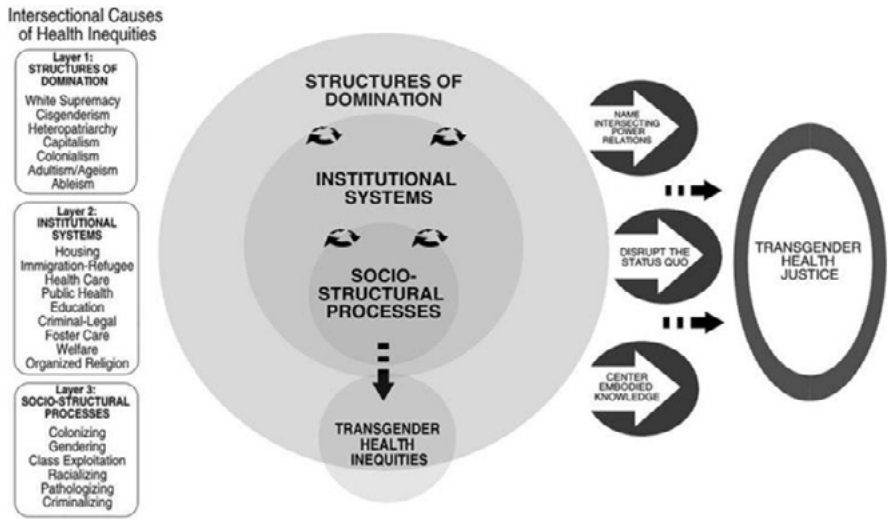
This concern becomes even more acute when physical indicators—such as surgical scars—unintentionally disclose a person's transgender identity, exposing them to potential discrimination or mistreatment in care settings (European Union Agency for Fundamental Rights, 2020; Simone & Appelbaum, 2011; Pang et al., 2019; Knochel & Flunker, 2021; Leyerzapf et al., 2016; Sharek et al., 2015). Compounding this vulnerability, cognitive decline can diminish a person's ability to assert their identity, heightening the risk of being misgendered or subjected to identity erasure by caregivers (Adan et al., 2021; Walker et al., 2023).

Although Malta has made notable legal advances—such as civil unions (2014), marriage equality (2017), and the Gender Identity, Gender Expression and Sex Characteristics (GIGESC) Act (2015)—these legislative milestones have not always translated into inclusive or affirming practices in LTC settings (Formosa, 2021; Cekic & Formosa, 2024; Leġiżlazzjoni Malta, 2014). At the time of writing, hormone therapy is publicly funded, but gender-affirming surgeries are not (Greg, 2022).

In extreme cases, when the care environment is perceived as transphobic, the anticipated trauma of entering such settings can be so overwhelming that some transgender individuals have expressed a preference for the onset of dementia over the possibility of institutionalisation (Knochel & Flunker, 2021). However, avoiding formal care services—regardless of the reason—often comes at a significant cost, resulting in social isolation, worsening health, and even suicidal ideation (Jones & Willis, 2015; Waling et al., 2019). These consequences are further exacerbated by the long-term impact of structural marginalisation, which has led to increased rates of unemployment, mental health challenges, substance use, and HIV among transgender older adults (Fredriksen-Goldsen et al., 2014; Mayer et al., 2008; Bockting et al., 2013).

In LTC settings, the intersection of transphobia and ageism produces compounded discrimination and social exclusion (Fredriksen-Goldsen & de Vries, 2019; Wesp et al., 2019). Addressing these complex challenges requires a critical lens that recognises how multiple, overlapping social identities—such as age, gender identity, and sexuality—interact to deepen experiences of marginalisation (Collins, 2015; Dhamoon & Hankivsky, 2011; Ludvig, 2006; Verloo, 2006; TGEU, 2024). This intersectional framework underpins the Intersectionality Research for Transgender Health Justice (IRTHJ) Framework and Action Plan, which calls for systemic transformation by embedding intersectionality into health research, clinical education, and policy development. By centring transgender voices and advancing justice-oriented care, the IRTHJ approach seeks to improve health outcomes and dismantle the structural barriers that sustain inequities—especially within elder care environments (Wesp et al., 2019).

Building on this foundation, Wesp et al.'s (2019) IRTHJ framework offers a powerful tool for examining how systemic injustice shapes the care experiences and outcomes of older transgender adults. This study draws on both intersectionality (Crenshaw, 1989) and theories of structural injustice (Young, 2016, 2020) to critically analyse how institutional policies, cultural norms, and service structures continue to marginalize transgender individuals in residential care environments.



Intersectionality Research for Transgender Health Justice (IRTHJ) Framework (Wesp et al, 2019).

Methodology

Research Design and Rationale

An interpretive phenomenological design was adopted to examine how transgender adults in Malta make sense of the prospect of residential elder care. Lived experience and 'meaning making' are foregrounded within this design (Creswell & Creswell, 2018), which permits exploration of emotional, psychological, and social dimensions and surfaces marginalised narratives (Greening, 2019; Witten, 2014). Accordingly, the approach was used to illuminate how gender identity, ageing, and care systems intersect in participants' accounts.

Setting and Participants

The study was conducted in Malta and focused on adults who self-identified as transgender. Seven participants took part. The authors acknowledge that this small, non-probability sample is not statistically representative and therefore limits its generalisability. The study aims to achieve analytical depth and ensure transferability through the use of thick description, rather than focusing on population inference.

Sampling and Recruitment

Purposive and snowball sampling were employed in collaboration with two local NGOs—Malta LGBTIQ Rights Movement (MGRM) and Allied Rainbow Communities (ARC)—who acted as gatekeepers and assisted with initial contact and trust-building within a hard-to-reach population. Recruitment materials (posters and bilingual information sheets in Maltese and English) were distributed in community venues and online spaces frequented by transgender individuals.

Data Collection Procedures

Semi-structured, phenomenological interviews were conducted between September and November 2024, either in person or online according to participant preference. Interviews were participant-led, lasted 35–45 minutes, and were audio-recorded with consent. Contemporaneous field notes were kept to document contextual and non-verbal cues (Halcomb & Davidson, 2006). Transcripts were produced verbatim. Participant reflections were invited on selected excerpts or preliminary interpretations to assess resonance with the analytic account, rather than to verify accuracy, in line with IPA's idiographic and interpretative focus.

Interview Guide

For transparency, the interview guide addressed seven domains: (1) perceptions of residential care and anticipated benefits/risks; (2) experiences of gender affirmation and misgendering in health or care settings; (3) expectations regarding privacy, personal care, and medication management (including hormones); (4) relationships, chosen family, and advocacy needs; (5) views on staff training, organisational policies, and environmental design; (6) future ageing plans and service preferences; and (7) brief demographic information (age, gender identity, living situation).

Flexible, participant-led probing was used to elicit depth while maintaining coverage of these domains. A semi-structured, pilot-tested schedule was used: the study purpose was explained, consent was obtained, and voluntariness was reaffirmed before a brief demographics block (age, gender identity, origin, education) was collected. Two core questions were then asked, namely (i) participants' thoughts and feelings about long-term care for elderly transgender people in Malta, and (ii) what care homes should do to provide good care for transgender residents. Probes were employed on prior care-home interactions, common challenges (e.g., misgendering), features of a supportive environment, safety, privacy, dignity, and trans-specific health needs (including hormones), and the interview was closed by inviting any additional points.

Data Analysis

An IPA was undertaken with an idiographic, experiential, and inductive orientation. The IRTHJ framework and structural injustice theory were employed as sensitising lenses at the stage of interpretative elaboration rather than as an a priori coding frame. Attention was given to the double hermeneutic throughout (participants' meaning-making and the researcher's sense-making of those meanings).

Analytic procedure:

1. Familiarisation and reflexivity: Interviews were transcribed verbatim, transcripts were read and re-read alongside field notes, and a reflexive journal was maintained to surface assumptions and support bracketing.
2. Exploratory noting (within case): Descriptive, linguistic, and conceptual comments were produced close to participants' accounts (e.g., metaphors, emphases, tone), keeping analysis grounded in lived experience.
3. Emergent experiential themes (within case): Concise experiential themes capturing the psychological essence of each case were developed, with clear links preserved to the originating data.
4. Structuring each case: Connections among a case's themes were examined (abstraction, subsumption, contextualisation, and, where relevant, polarisation), and a within-case thematic map was produced.
5. Case-by-case progression: Insights from prior cases were bracketed before proceeding, to preserve ideography and approach each subsequent transcript afresh.
6. Cross-case patterning: Convergences and divergences across cases were then explored to build group-level experiential themes.
7. Interpretative elaboration: Patterned meanings were reconsidered through IRTHJ and structural injustice lenses to illuminate how intersecting positions and institutional arrangements shaped experience; these lenses sensitised, but did not override, participants' accounts.
8. Credibility and transparency: An audit trail (reflexive diary, decision logs, analytic tables) was maintained; peer debriefing/supervision was undertaken; disconfirming evidence was actively sought; and member reflections were invited on selected interpretations where feasible.
9. Presentation of evidence: A narrative, interpretative account is presented in the Findings, supported by verbatim extracts that evidence each analytic claim.

Trustworthiness, Reflexivity, and Rigour

Credibility was enhanced through member checking and thick, data-grounded description; confirmability through a reflexive memoing practice that recorded assumptions and their potential influence on analysis; and transferability through detailed contextualisation of the setting and participants. Reflexive diaries were maintained throughout to monitor positionality, roles, and evolving interpretations. Researcher positionality was addressed by documenting the authors' backgrounds in ageing services, social work, and LGBTQ+ health and by maintaining reflexive memos.

Ethical Considerations

Ethical approval for the research was granted by IDEA College, and written informed consent was obtained from all participants before interviews were scheduled. Given the sensitivity and potential identifiability of demographic data, strict confidentiality safeguards were implemented (anonymisation and coding of identifiers; encrypted storage with researcher-only access; no third-party sharing). Information on psychological support resources was provided, and participation could be paused or discontinued at any time. De-identified transcripts and associated analytic materials were accessible from the corresponding author upon reasonable request. Audio files and direct identifiers were not shared due to confidentiality and re-identification risks. All data were scheduled for destruction one month after study completion.

Limitations and Reflexivity

Methodologically, the study encountered several limitations common to qualitative research. The small sample size (n = 7) and community-based, NGO-facilitated recruitment limit the generalisability of the findings and may over-represent individuals already connected to advocacy networks. While the foregoing procedures are believed to support transparency and reproducibility, it is recommended that larger and more diverse samples (including individuals not engaged with NGOs) be examined in future studies, and that longitudinal designs be employed to assess the durability of the patterns reported here.

Furthermore, the interpretive nature of phenomenological methods introduces subjectivity, and variations in participant engagement and emotional involvement may have influenced the depth of data collected (Mwita, 2022; Ritunnano et al., 2023; Vasileiou et al., 2018; Andrade, 2021). To address these challenges, the study employed participant validation, maintained reflexive diaries, and engaged in peer debriefing to strengthen credibility.

Findings

Through an idiographic, case-by-case IPA of the interview accounts, three superordinate experiential themes were developed that describe how participants anticipate and imagine residential care in Malta: (1) Fear of Discrimination, Misgendering, and the Loss of Identity; (2) A Vision for Affirming and Inclusive Trans-Ageing Care; and (3) Building Inclusive Futures: Education, Awareness, and Social Change. Recurring patterns across cases were compared and convergences noted, while the distinctive meanings of each individual account were preserved.

Theme 1: Fear of Discrimination, Misgendering, and Loss of Identity

Participants expressed deep concerns about facing discrimination and misgendering in residential care homes. Many feared that staff might not respect their gender identity, leading to emotional distress and a sense of invisibility. For example, one participant stated, "I worry they will call me by the wrong pronouns or refuse to acknowledge my name." The fear of losing autonomy and identity was linked to past negative experiences in healthcare and social services.

"I am afraid that in a home, I would encounter people who are supposed to take care of me, but don't." (Participant 2, 35, transgender man)

Misgendering was described as emotionally harmful and retraumatising:

"To go from the frying pan into the fire. From your family to the scary home that still misgenders you." (Participant 4, 23, transgender man)

Participants feared medical neglect, especially the denial of hormone treatment due to staff ignorance:

"I'm afraid… they will decide not to give me hormone treatment." (Participant 5, 48, transgender woman).

Non-binary individuals faced distress encountering rigid gendered systems:

"I don't know where they would place me… the carers don't know how to refer to me." (Participant 7, 24, non-binary)

There were also concerns about being marginalised due to others' cultural or religious beliefs, especially when physically or cognitively vulnerable. Some expressed that hiding their identities in care settings was not an option:

"For a trans person, it's impossible to hide who I am." (Participant 2, 35, transgender man)

These accounts underline the structural vulnerabilities and emotional toll faced by transgender individuals in considering institutional care.

Theme 2: A Vision for Affirming and Inclusive Trans-Ageing Care

Participants expressed a desire for residential care that respects and affirms their gender identity. They highlighted the importance of training staff on transgender issues, inclusive policies, and physical environments that allow privacy and dignity. Access to hormone therapy, respectful use of names and pronouns, and understanding of trans-specific anatomy were all seen as essential for their wellbeing.

"If I'm treated as a man, I don't expect anything more." (Participant 3, 60, transgender man)

Criticism was levelled at "treating everyone the same," which participants saw as rooted in cisnormativity. Trusted, long-term access to gender-affirming care—especially from gender clinics—was highlighted as vital.

Mental health support, control over who provides personal care, and gender-sensitive communication were also seen as integral to inclusive care:

"There should be counselling available… a person could live serenely." (Participant 1, 28, transgender man).

Participants also called for greater visibility and inclusion of queer representation in care settings, including books, events, and community connections. Some envisioned the creation of LGBT-specific care homes, or at a minimum, demonstrably inclusive mainstream services.

Theme 3: Building Inclusive Futures Through Education, Awareness, and Social Change

Participants also spoke about the need for continuous education and raising awareness among staff and the broader community to address stigma. They advocated for joint efforts between policymakers, healthcare professionals, and LGBTQ+ organisations to drive systemic change. They also highlighted the importance of ongoing, system-wide training on LGBTQ+ issues, including effective communication with residents with dementia or limited language abilities.

"Awareness! I think, if people understand, there won't be any problems." (Participant 3, 60, transgender man).

Participants advocated for training that includes medical understanding of trans bodies and suggested that education should extend to other residents as well:

"Maybe, if they hold life talks or bring in an example of someone who is transgender…" (Participant 3, 60, transgender man).

While recognising generational gaps and persistent stigma, participants expressed cautious optimism that future care environments would become more accepting and inclusive:

"I think, by the time we grow old, the mentality would have changed." (Participant 5, 48, transgender woman).

Discussion

This study highlights the complex challenges faced by transgender older adults in Malta in relation to residential care homes. Drawing on intersectionality theory (Crenshaw, 1989) and Young's concept of structural injustice (2016, 2020), the findings reveal how age, gender identity, and institutional design intersect to create compounded vulnerabilities for transgender elders. The participants' anxieties about misgendering, discrimination, and loss of autonomy reflect not only interpersonal prejudice but also the pervasive influence of systemic cisnormativity embedded within care infrastructures, policies, and professional practices.

Fear of institutional erasure—particularly through misgendering or denial of gender-affirming care—was a central theme. These fears are not merely personal but stem from a history of marginalisation within medical and social systems. Structural injustice theory helps to conceptualise how institutions may perpetuate harm through policies that appear neutral but in practice fail to recognise or accommodate the specific needs of marginalised groups. For example, the absence of clear protocols around hormone administration or gender-appropriate placement reflects a broader systemic failure to treat transgender identities as legitimate and enduring within eldercare.

From an intersectional perspective, participants' accounts reveal how transgender elders experience overlapping systems of disadvantage. These include not only cisnormativity and ageism but also ableism and ethnocultural bias, particularly when care staff come from cultural backgrounds unfamiliar with trans issues. The multiplicity of these intersecting oppressions results in a unique form of structural invisibility, where transgender individuals must constantly advocate for basic recognition and dignity.

Participants' call for gender-affirming care practices—including consistent use of pronouns, autonomy over care routines, and visibility within institutional culture—demands a shift from a "treat everyone the same" logic towards equity-based care. As Young (2016) argues, structural injustice persists not through the actions of any single agent but through institutional inertia and failure to redesign systems to accommodate difference. Standardisation in care practices—while administratively convenient—operates as a mechanism of exclusion for those whose identities fall outside dominant norms.

Furthermore, the study reveals how the structural configuration of residential care—such as shared living spaces, rigid gender segregation, and the lack of privacy—undermines transgender individuals' sense of safety and autonomy. These architectural and organisational norms function as mechanisms of disciplinary power that constrain self-expression and reinforce binary gender assumptions.

Participants also highlighted the potential of inclusive practices—such as LGBT-affirming symbols, queer cultural representation, and staff training—as tools for cultural transformation. However, from a structural perspective, such initiatives must be embedded within organisational policies and accountability frameworks to ensure sustainability. Intersectionality reminds us that tokenistic inclusion risks re-inscribing power hierarchies if it does not address broader institutional cultures of exclusion.

Importantly, participants' resistance to "returning to the closet" reveals a growing refusal to comply with systems that negate their identities. This aligns with Young's view of responsibility for justice, which emphasises the moral obligation of institutional actors to reform structures that perpetuate inequality, even if harm is not the result of individual intent. For residential care settings, this entails moving beyond individual-level training to rethinking care models, policies, and everyday practices to ensure they support diverse and historically excluded populations.

Finally, these findings point to an urgent need for state-led and sector-wide reform. Structural injustice in residential care cannot be addressed solely through micro-level adjustments; it requires a multi-layered response involving legal safeguards, policy revision, culturally competent workforce development, and inclusive service design. Only by confronting the intersecting structures of gender, age, ability, and institutional power can residential care environments become truly affirming spaces for transgender older adults.

Conclusion

This study did not test a formal hypothesis; instead, it addressed a central research question: how do transgender adults in Malta understand and anticipate residential elder care, and what conditions would make such care affirming? The evidence explicitly confirms the study's initial assumption that transgender individuals encounter substantial barriers in residential settings—most notably misgendering, breaches of privacy, anxieties around hormone management, and limited staff preparedness. At the same time, the findings refine (and partly challenge the inevitability of) that assumption by showing that avoidance of residential care is not predetermined: participants identified concrete, achievable conditions (robust gender-affirming protocols, enforceable privacy safeguards, recognition of chosen family, and sustained staff education) under which residential care would be acceptable.

Interpreted through an IRTHJ lens, the results indicate that piecemeal or tokenistic measures are inadequate; what is required is multi-level, justice-oriented reform (Wesp et al., 2019). In practice, this implies: (a) ongoing staff education that moves beyond awareness to measurable practice change; (b) enforceable organisational policies that protect autonomy and dignity, including explicit gender-affirming care pathways and clear mechanisms for recognising chosen family; and (c) environmental and procedural adaptations—such as private rooms and confidential medication management—that make everyday inclusion routine rather than exceptional. Broader public-facing education is likewise needed to reduce stigma within care settings and the wider community.

These conclusions should be read considering the study's limitations. The small, NGO-facilitated sample (n = 7) constrains statistical generalisability; however, the depth of the interviews offers transferable insights into how residential care can be reshaped from a locus of risk to one of safety, dignity, and affirmation. Future research should extend these analyses with larger and more diverse samples, include individuals not connected to NGOs, and consider longitudinal or comparative designs across providers and jurisdictions to identify the organisational levers that most effectively deliver trans-affirming, rights-based residential care.

In sum, the evidence both confirms the core assumption of pervasive barriers and clarifies the conditions under which those barriers can be dismantled. Improving residential care for transgender elders in Malta is therefore a matter of structural justice rather than minor service adjustment; progress will depend on integrated strategies—policy, practice, environment, and culture change—that actively value, protect, and enable transgender people's autonomy and wellbeing in later life (Wesp et al., 2019).

Recommendations

1. Implement comprehensive training programmes for LTC staff to improve understanding of transgender issues, gender diversity, and cultural competence. Training should include correct pronoun use, respectful communication, and sensitivity to the unique needs of transgender elders.
2. Develop and enforce inclusive policies and procedures that protect transgender residents from discrimination, ensure privacy, and promote affirming care practices.
3. Create physical environments that provide adequate privacy and safety, including access to single-room accommodations and gender-appropriate facilities.
4. Engage transgender older adults in the design and evaluation of LTC services to ensure their voices and preferences inform service delivery.
5. Promote community partnerships and social support networks, including recognition of chosen families, to reduce isolation and improve mental health outcomes.
6. Advocate for ongoing research and data collection on transgender older adults' needs and experiences to inform evidence-based policy and practice.
7. Launch public awareness campaigns to challenge stigma and foster social acceptance of transgender people ageing in place.

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Conflict of Interest

No conflict of interest is present.

Authorship

Natasha Gilson – 50%
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11 Recreational bathing water in Malta: a cross-sectional survey of awareness, information use, and perceived risks.

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Abstract

Aims of the Study: This study aimed to investigate the health risks associated with recreational bathing water within the Maltese Islands and to identify effective strategies and technologies to enhance bathing water safety

Methods: This study predominantly adopted a quantitative research paradigm to provide a systematic and objective framework for examining relationships among multiple factors. A cross-sectional design was used to collect data from 385 responses through quota sampling, ensuring representation across age groups, localities, and genders. Instrument validity was established through face and content assessments. The sample size achieved a ±5% margin of error for an undetermined population, allowing meaningful insights into the prevalence and associations of key variables.

Results: Typically, respondents have internet access and are aware of beach use and hygiene regulations but lack knowledge about key aspects, including checking water quality reports, understanding the bathing water monitoring program, and interpreting site classification codes. Respondents prioritise the availability of adequate health and safety information, and essential facilities, for example freshwater taps, toilets and parking to improve their beach-going experience.

Conclusions: There is a need for better communication and facility development to ensure safety and comfort at beaches and of conducting longitudinal research that provides a framework for implementing short- and long-term recommendations to enhance bathing water safety.

Keywords: "Recreational bathing water"; "health risks"; "safety".

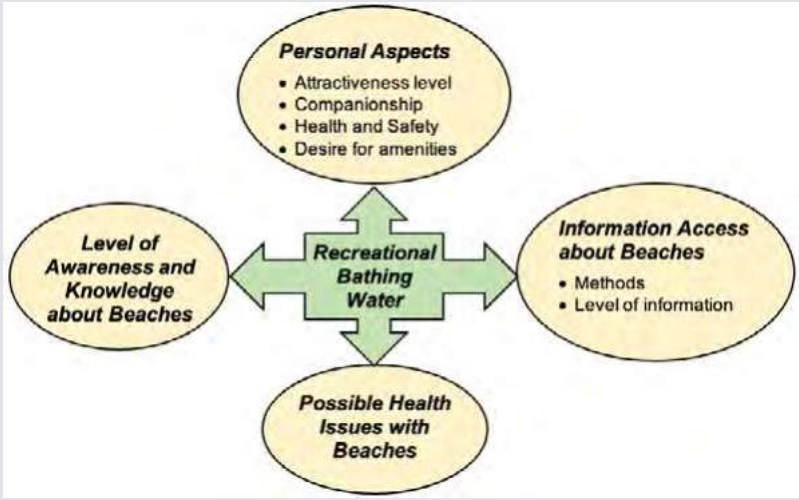

Figure 1: Graphical Abstract - Recreational Bathing Water Characteristics & Possible Health Issues

Highlights:
- Most official bathing sites are located in the Northern Region.
- Females are more attentive about beach safety and amenities.
- Respondents rarely access government websites about bathing water quality and conditions.
- Minor health issues experienced with very few beach closures.
- Personal attributes have little impact on perceptions of bathing water quality.

Introduction

The profession of the Environmental Health Officers (EHOs) was established to safeguard public health, primarily through their active involvement in the "One Health" approach (World Health Organisation, 2022). This comprehensive framework integrates the wellbeing of "people, animals, and the environment" (Musoke et al.,2016, p.1) into a unified strategy, emphasising the interconnectedness of these elements in safeguarding public health from any adverse environmental effects (Government of Malta, Environmental Health Directorate, 2023c). EHOs are tasked with a diverse array of responsibilities that directly support this mission. These include routine monitoring of water quality through the systematic collection of water samples from the eighty-seven official bathing sites (Government of Malta, Environmental Health Directorate, 2023a) as well as from the sixteen designated dog-friendly beaches across the Maltese Islands (agrikoltura.gov.mt, office of the commissioner for animal welfare, 2024).

This critical surveillance work ensures that bathing waters adhere to safety standards, protecting the public from waterborne diseases and environmental contaminants. In cases where bathing sites fail to meet the established health and safety thresholds, EHOs are responsible for overseeing and enforcing closures to prevent public exposure to potential health hazards (Public Health Act, 2008; Public Health Act, 2011). Beyond water quality monitoring, EHOs duties extend to also food safety inspections (Government of Malta, Environmental Health Directorate, 2023b), all of which contribute to a safer, healthier environment for the public. By addressing health risks across multiple domains, EHOs support a sustainable and proactive public health system, one that can respond to emerging challenges within a shared and dynamic ecosystem.

Waterborne diseases can spread not only through contaminated drinking water but also through recreational bathing water, such as beaches and interactive water fountains (recreational waters) (Magana-Arachchi and Wanigatunge, 2020). Monitoring programs are designed to protect swimmers by assessing bacterial levels, such as Escherichia coli (E. coli) and coliforms (Sanborn & Takaro, 2013). Beaches are closed when water sample results exceed regulatory thresholds for E. coli and intestinal enterococci (Public Health Act, 2008; 2011).

A significant gap in the literature is the lack of comprehensive records on waterborne diseases in Malta linked specifically to recreational water. Another important gap concerns public awareness of water quality and the associated health risks of swimming in contaminated waters, particularly following heavy rainfall or during periods when bathing areas are closed due to elevated levels of bacteria such as E. coli and intestinal enterococci. Additionally, there is limited research on how poor bathing water quality disproportionately affects vulnerable populations, including children, the elderly, and individuals with pre-existing health conditions. Addressing these gaps is essential to protect public health, promote safe recreational practices, and strengthen the objectives of the One Health approach.

Therefore, this study aims to investigate the health risks associated with recreational bathing water in the Maltese Islands and to identify effective strategies and technologies to enhance bathing water safety.

Methodology

Sample and Research Design of the Study

This research employs a theoretical model grounded in the quantitative research paradigm. A quantitative approach is prioritised as the primary methodological framework. Data are collected through a structured questionnaire designed to examine the complex interrelationships among various factors, including individual antecedents, potential health risks, personal concerns related to beaches, levels of awareness and knowledge about beach environments, accessibility of information, and the popularity and usage patterns of different recreational beaches. The research instrument was developed following a comprehensive review of relevant academic literature (Bengsch, 2018; Galorio & Naling, 2024; Mallick et al., 2023; Shepherd, 2014) and aims to measure variables within the following categories:

• Antecedents: gender, age, marital status, education level, residence, and priority concerns of respondents.

• Recreational Bathing Water: information about beaches visited, access to beach information, awareness and knowledge of beach conditions, health issues experienced at beaches, and general personal concerns regarding visited beaches.

The survey was administered in English and distributed among members of St John Ambulance and Rescue, along with their relatives. This organisation is a prominent international non-governmental organisation (NGO) in Malta, widely recognised for its dedication to public health and humanitarian efforts (St John Ambulance, 2024). Committed to inclusivity across cultures, races, and beliefs, this NGO operates under the motto "Pro Fide Pro Utilitate Hominum" ("For the Faith and in the Service of Humanity"), which underscores its focus on community welfare (St John Malta, n.d.).

A target sample size of 385 respondents was computed for an undefined population to ensure the attainment of at least a margin of error of ±5%. The sample was designed to represent a diverse range of age groups, localities, and genders. As noted by Lobiondo-Wood and Haber (2022), a margin of error of 5% to 7% is generally acceptable for survey research. The participation of the survey was voluntary. This means that respondents were at liberty to accept or decline their participation and/or skip any question. This study did not utilise an instrument that measures concepts. Therefore, validation for this type of questionnaire is based on content and face validity. The research questionnaire is constructed on a series of questions taken from various research studies appearing in multiple academic journals (Bengsch, 2018; Galorio & Naling, 2024; Mallick et al., 2023 and Shepherd, 2014).

The identified research questions are as follows:

1. What is the attractiveness level of beaches visited for recreational purposes by respondents?

2. What are the methods and level of information access by the respondents about beaches?

3. What is the level of awareness and knowledge about beaches of the respondents?

4. What is the level of possible health issues about beaches being visited by respondents?

5. What are the personal aspects about beaches visited by respondents in terms of companionship when visiting beaches; lack of information regarding water quality, health and safety, and amenities; and desire for facilities?

6. What is the relationship between beaches visited for recreational purposes; level of information access; awareness and knowledge about beaches; and possible health issues?

7. What is the relationship between the various antecedents and (a) extent beaches are visited; (b) level of information access; (c) awareness and knowledge about beaches; (d) possible health issues; and (e) general personal aspects about beaches of the respondents?

Data Collection, Validity and Reliability Assessment

As stated previously, this research did not apply instruments that measured concepts and aspects within the concepts, such as job satisfaction or motivation. The data collected was comprehensive and explicit using single item factual questions. Hence, face and content validity were principally applied using questions utilised in several previous academic research studies. Furthermore, the eight items for awareness and knowledge about beaches were evaluated for internal consistency using Cronbach alpha. This yielded a reliability coefficient of 0.780 that is considered acceptable. Face validity refers to the extent to which a measure appears to assess the intended construct based on intuitive or surface-level judgment. In contrast, content validity involves expert evaluation of whether the instrument comprehensively captures all relevant dimensions of the construct used. While both forms of validity contribute to ensuring that the instrument measures what it is intended to, content validity emphasises coverage and depth, whereas face validity pertains to the perceived clarity and relevance of the items.

Results

Descriptive Statistics and Bivariate Correlations

Descriptive statistics (see Table 1) revealed that many variables approximated the normal distribution, permitting the use of parametric tests in relevant instances. Where assumptions of normality were not met, non-parametric techniques such as the Chi-square test were employed. Measures of central tendency, dispersion, skewness, and kurtosis supported these findings. Bivariate analysis is shown at Tables 3 (the legend for Table 3 is provided at Table 2) that reveal statistically significant associations between respondent characteristics and key behavioural patterns.

Variables	Mean	Median	Mode	Std. Dev	Skewness	Kurtosis	Minimum	Maximum
Antecedents								
Gender	1	1	1	0.480	0.874	-0.886	1	3
Age	5	5	3	2.646	0.308	-0.918	1	10
Marital Status	2	2	3	0.808	-0.364	-1.376	1	3
Education	5	6	6	1.445	-0.330	-0.978	2	8
Residence Location	4	4	5	1.468	-0.542	-0.896	1	6
Key General Issues	3	3	4	1.110	-0.349	-1.092	1	5
Frequency of Visit	3	2	2	0.832	0.370	-0.760	1	4
Access to information								
Internet Access	4	4	4	0.708	-2.134	4.132	1	4
Government Website	2	2	1	0.832	1.030	0.452	1	4
Water Quality	2	2	1	0.831	1.050	0.599	1	4
Knowledge of beaches								
Awareness Monitoring	5	5	1	2.760	0.244	-1.078	1	10
Awareness Official Sites	0	0	0	0.492	0.378	-1.867	0	1
Awareness of Bathing Season	0	0	0	0.500	0.060	-2.006	0	1
Awareness Notices	5	5	5	2.483	0.127	-0.916	0	10
Awareness of Programs	4	4	1	2.479	0.572	-0.504	0	10
Awareness Site Codes	3	2	1	2.321	1.132	0.659	0	10
Awareness Abuse	3	2	1	2.234	1.285	1.084	0	10
Awareness Reporting Abuse	1	1	1	0.425	-1.255	-0.428	0	1
Beach Health Issues								
Experienced Health Issues	3	2	1	2.194	1.587	1.775	0	10
Awareness Diseases	5	5	1	2.949	0.167	-1.221	0	10
Disease Knowhow	1	1	1	0.501	-0.020	-2.010	0	1
Visiting Beaches								
Accompanied Visit	3	3	4	0.903	-0.978	0.667	0	4
Adequate Information								
Information on Quality	0	0	0	0.416	1.339	-0.207	0	1
Information on Health/Safety	1	1	1	0.499	-0.141	-1.990	0	1
Information on Amenities	0	0	0	0.476	0.655	-1.579	0	1
Facilities Desired								
Facilities Toilets	1	1	1	0.467	-0.775	-1.407	0	1
Facilities Water Access	0	0	0	0.500	0.080	-2.004	0	1
Facilities Café	0	0	0	0.415	1.357	-0.160	0	1
Facilities Fresh Tap Water	1	1	1	0.491	-0.410	-1.841	0	1
Facilities Car Parking	1	1	1	0.496	-0.263	-1.940	0	1
Facilities Information Board	1	1	1	0.500	-0.090	-2.002	0	1
Facilities Changing	0	0	0	0.499	0.141	-1.990	0	1

Table 1: Key Descriptive Statistics for Collected Data

No	Variable	No	Variable
	Antecedents		***Health and Safety***
1	Gender	16	Experienced Health Issues
2	Age	17	Awareness Diseases
3	Marital Status		***Information Availability***
4	Education	18	Accompanied Visit to Beach
5	Residence Location	19	Information on Quality
6	Key General Issues	20	Information on Health and Safety
7	Frequency of Visit	21	Information on Amenities
	Access to Information		***Facilities Desired***
8	Internet Access	22	Facilities Toilets
9	Government Website	23	Facilities Water Access
10	Water Quality	24	Facilities Café
	Knowledge and Awareness	25	Facilities Fresh Tap Water
11	Awareness Monitoring	26	Facilities Car Parking
12	Awareness Notices	27	Facilities Information Board
13	Awareness of Programs	28	Facilities Changing
14	Awareness Site Codes		
15	Awareness Abuse		

Table 2: Legend: Variables for Bivariate Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	1																											
2	0.029	1																										
3	-.135**	.360**	1																									
4	-0.011	.266**	-0.053	1																								
5	0.008	-0.031	0.01	-.115*	1																							
6	-0.071	.143**	0.035	-.118*	0.001	1																						
7	-0.012	0.021	0.092	0.023	0.016	0.029	1																					
8	0.092	-0.032	0.097	.228**	-0.032	-0.01	0.065	1																				
9	-.135**	.140**	.129**	0.026	0.071	0.028	0.066	0.028	1																			
10	-.129**	0.03	0.039	0.058	.135**	0.05	0.044	0.025	.633**	1																		
11	-0.041	.184**	.123*	0.078	-0.005	0.002	0.047	.101*	.380**	.367**	1																	
12	0.078	.125*	0.081	0.001	0.07	0.00	0.02	0.046	.187**	.176**	.453**	1																
13	0.004	.143**	0.089	0.045	0.047	0.023	0.007	0.066	.384**	.330**	.650**	.595**	1															
14	0.064	0.091	0.072	0.05	0.048	0.025	0.012	0.025	.282**	.248**	.515**	.508**	.731**	1														
15	0.024	0.067	0.046	-0.076	0.018	0.054	0.06	-0.07	.194**	.158**	.405**	.371**	.467**	.541**	1													
16	0.074	-0.051	0.029	-0.036	-0.026	.130**	.171**	-0.027	0.05	.108*	0.05	0.048	.121*	.134**	.167**	1												
17	-.174**	0.003	0.08	-0.031	0.059	0.068	0.069	0.02	.233**	.275**	.345**	.300**	.430**	.326**	.323**	.233**	1											
18	-.101*	-.114*	.155**	0.071	0.026	-0.004	.110*	0.045	0.004	0.053	0.044	0.054	0.069	0.07	-0.069	-0.033	0.073	1										
19	0.032	-0.067	-0.026	-0.081	0.044	-0.047	0.008	-0.023	0.052	.166**	.134**	0.072	.176**	.141**	.115*	0.071	.158**	0.049	1									
20	-0.018	-.152**	-0.073	-0.087	0.058	-0.002	0.039	-0.038	0.075	.119*	-0.011	0.07	0.086	.136**	.178**	0.05	0.065	0.018	.101*	1								
21	.104*	0.049	.140**	0.011	-.107*	0.046	.107*	.155**	-0.034	-0.01	0.025	0.026	0.013	0.038	-0.047	0.019	-0.029	.116*	0.067	-.146**	1							
22	-.120*	-0.097	0.019	.108*	-0.042	-0.048	-0.073	0.045	0.025	0.085	0.007	-0.056	0.031	-0.024	-0.03	0.035	0.004	0.063	0.032	0.048	-0.077	1						
23	-0.049	-0.007	.132**	0.094	0.016	-0.001	0.005	.137**	0.054	0.083	0.039	0.043	0.08	0.066	0.071	.137**	.115*	0.057	-0.021	0.073	.103*	.198**	1					
24	-0.003	0.07	.125*	0.009	-0.09	0.096	0.012	0.025	-0.03	0.007	0.005	0.029	0.022	0.021	0.084	-0.005	0.016	0.049	0.021	-0.001	.110*	.209**	.154**	1				
25	0.028	0.04	0.092	0.055	-0.035	0.018	0.037	.107*	0.072	0.069	0.088	0.014	0.008	-0.004	0.012	-0.02	-0.015	.106*	-0.017	0.027	0.077	.173**	.131**	.113*	1			
26	-0.042	.106*	.149**	-0.036	-0.019	-0.049	-0.036	-0.037	-0.005	0.089	-0.058	0.022	-0.011	-0.019	0.036	0.03	0.032	0.039	0.057	0.041	0.085	.220**	.237**	.283**	0.004	1		
27	0.081	.174**	.147**	-0.017	-0.029	0.018	0.093	-0.006	0.073	0.06	.102*	.109*	0.091	0.077	0.095	-0.017	.120*	0.007	-0.018	0.022	0.062	.117*	.227**	.145**	.149**	0.06	1	
28	-.117*	-0.019	.108*	0.065	-0.033	0.003	-0.069	.110*	0.033	0.08	.114*	0.034	0.009	-0.077	-0.02	0.037	0.005	.146**	0.007	0.095	0.04	.231**	.228**	.170**	.219**	.110*	.098*	1

Antecedents | Access to Data | Knowledge & Awareness | Health | Knowledge Availability | Facilities Desired

Table 3: Spearman's Rho Bivariate Correlations – Relationship between Variables
** Correlation is significant at the 0.01 level (2-tailed). * Correlation is significant at the 0.05 level (2-tailed)*
The variable number in the horizontal axis corresponds to the variable number on the vertical axis.

Below is a summary of results obtained from this research study. Notably, older participants and those with dependents were more likely to access government websites and express interest in monitoring data and safety information. Disease awareness showed a low but positive correlation with interest in water quality and informational signage.

Antecedents: The study examined key demographic antecedents, including gender, age, marital status, education, residence, general concerns, and frequency of visits. A gender imbalance was evident, with females comprising 67.8% of respondents, indicating greater interest or engagement among women. Although the age distribution was relatively even, the 31–35 age group was notably prominent, while individuals aged over 55 were underrepresented. This is likely due to age-related mobility limitations, health concerns, and differing leisure preferences. The strong participation of the 31 to 35 age group may reflect family-oriented motivations, as beaches typically offer child-friendly amenities. Additionally, 56.1% of respondents reported having no dependents, and 52% held higher education qualifications (degree or equivalent or master's degree), suggesting a well-informed sample capable of engaging meaningfully with bathing-related issues.

Geographically, a significant portion of respondents (38.5%) were from the Northern Sector, particularly Gharghur; Mellieha; Mosta; Naxxar; Mgarr; and San Pawl il-Bahar. Environmental concerns were prominent, with 44.8% of respondents identifying the environment as a key issue, followed by sustainable development (28%) and traffic management (14.5%). Interestingly, 53.3% of respondents reported either rarely visiting beaches (48.5%) or not at all (4.8%), which is unexpected considering Malta's small size and coastal nature. This suggests that factors beyond geographic proximity, such as personal preferences, environmental concerns, or lifestyle choices, may influence beach visitation patterns.

Favourite Beach Visit: The results indicate that the most frequented beaches among respondents are Mellieha Bay (30%); Ghajn Tuffieha (24%); Golden Bay (23%); Gnejna (23%); and Armier (22%). These preferences are further supported by spatial data presented in Figure 2, which illustrates visitation patterns across Zone A – Malta North.

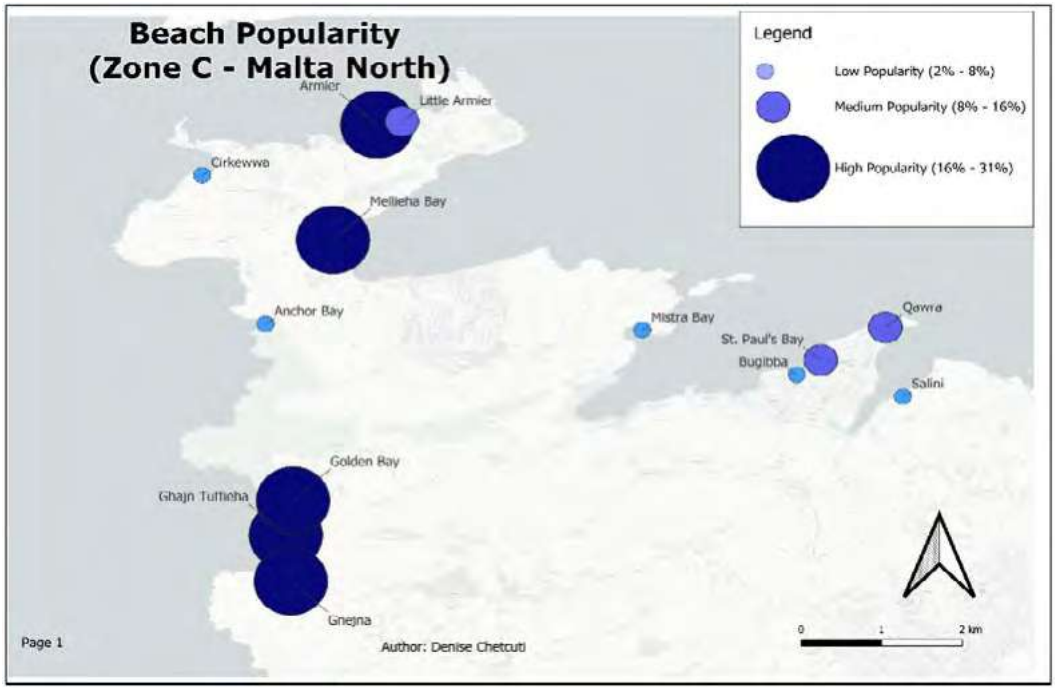

Figure 2: Beach Popularity Based on Survey Responses – Zone B (Malta North)

Access to information: The findings reveal a high level of digital connectivity among respondents, with 75% reporting frequent internet access. Specifically, 17% stated they access the internet often, while a significant 75% identified as being very active online. This reflects the pervasive role of the internet in daily life. In contrast, only 2.8% of participants reported having no internet access, indicating near-universal connectivity within the sample. Despite this high level of internet usage, engagement with official online sources of environmental information remains low. The majority of respondents (47.8%) reported that they do not regularly visit official government websites or social media platforms to obtain information about the quality of recreational bathing waters in Malta. Only 15.5% indicated that they visit such platforms often or very often. Additionally, just 14.8% of respondents reported actively checking or seeking water quality information before swimming, suggesting a gap between digital access and environmental health awareness or behaviour.

Awareness and Knowledge about Beaches: While 51% of respondents showed moderate to high awareness of the Environmental Health Directorate's monitoring of 87 bathing sites, and 51.6% viewed current public communication methods as adequate, a significant knowledge gaps persist. Many respondents lacked understanding of key aspects of the Bathing Water Monitoring Programme: 60.9% were unfamiliar with the classification update report, 76.1% did not understand site codes, and 77.9% were unaware of the correct authority to report to when observing a pet or domestic animal on sandy beach or in the official bathing site. These findings highlight a divide between general awareness of monitoring practices and understanding of specific reporting protocols and technical documentation, suggesting a need for improved public education and clearer communication strategies.

Health Issues about Beaches Visited: The majority of respondents (66.3%) reported no or very low concern about experiencing health issues, such as skin rashes or gastrointestinal problems, after swimming in recreational bathing water. However, 53.3% demonstrated awareness of the potential diseases associated with swimming in contaminated water, and 50.5% were able to name at least one example.

Issues regarding information availability and desired facilities: A significant majority (95%) of respondents reported visiting beaches with friends, family, or both, rather than alone. Perceptions of information availability varied: only 22% believed there was adequate information on water quality, and 35% felt the same about nearby amenities (refer to Figure 3). In contrast, 54% of respondents considered the available information on health and safety to be sufficient.

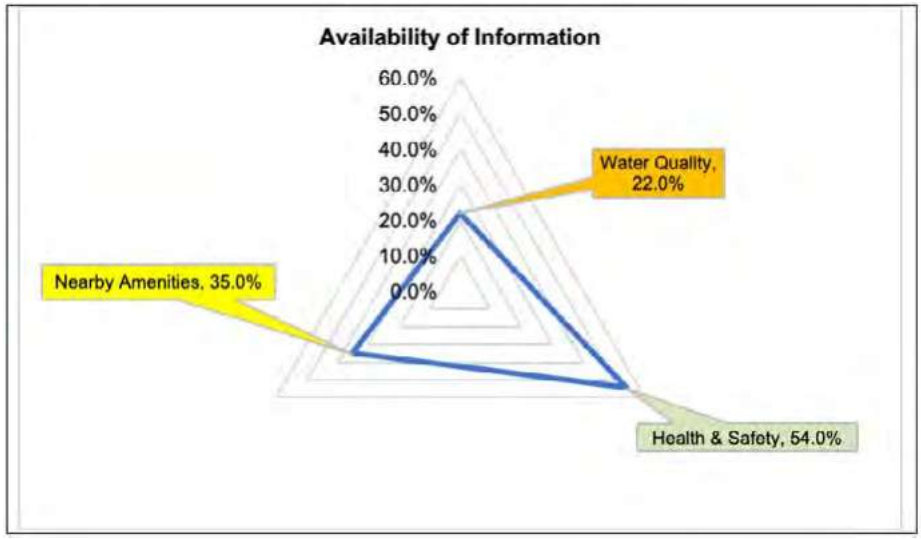

Figure 3: Summary: Availability of Information

Figure 4 highlights the additional facilities respondents would like to see at the beaches they frequent. The most desired improvements include better toilet facilities (68%), freshwater taps (60%), parking areas (57%), and information boards (52%). Notably, only 22% of respondents expressed interest in having café facilities, suggesting a preference for practical amenities over commercial or leisure-focused services.

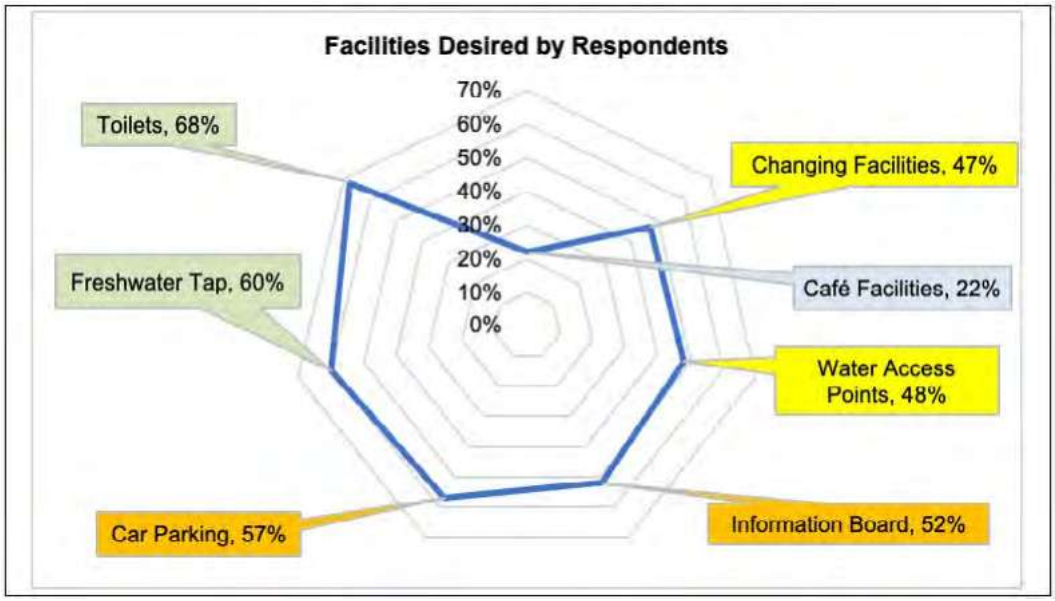

Figure 4: Summary of Facilities Desired by Respondents

Discussion

The findings highlight the preferences of respondents regarding recreational water bathing locations and facilities, and related issues as follows:

Favourite beaches and facilities: The findings suggest that Mellieha Bay (30%) is considered as the most popular beach in the Maltese Archipelago, favoured for its large sandy area and family-friendly amenities, followed by Ghajn Tuffieha. Golden Bay remains popular mainly among tourists due to its natural beauty and ecological significance. In Gozo, Marsalforn and Comino are preferred. Additionally, eighteen out of 87 official bathing sites hold Blue Flag status, reflecting high environmental and safety standards. Statistical analysis highlights that beach popularity influences water quality management priorities, underscoring the importance of maintaining standards at family-oriented and frequently visited beaches. These findings support the development of balanced strategies that promote both sustainability and recreational use.

Access to information: Most respondents frequently (17%) and very frequently (75%) have at least one access to internet connection. Among these respondents, 67% were female, 33% were male, and 1% identify as other. This trend corresponds with data from the National Statistics Office on ICT Usage by Households (2023) (National Statistics Office (Labour Market and Information Society Statistics Unit), 2023), which further highlights that females (94%) are the predominant internet users throughout the year, compared to males (90.3%) (National Statistics Office (Labour Market and Information Society Statistics Unit), 2024).

Awareness and knowledge about beaches: This study investigated public awareness and knowledge regarding bathing water quality and monitoring in Malta, in line with the Bathing Water Directive's requirements for transparency and public access to water quality status and warnings (Official Journal of the European Union, 2006). Findings reveal moderate public knowledge of official bathing sites (41%) and the bathing season (49%), with higher awareness (77%) concerning reporting the presence of pets on beaches, indicating better understanding of beach use and hygiene regulations than environmental water quality.

Comparatively, Shepherd (2014) found very low public awareness of bathing water status in Dorset, UK, especially among non-water users, suggesting a communication gap in disseminating water quality information to the public. Similarly, this research highlights limited understanding of Site Classification reports and site codes in Malta (awareness levels of 39% and 24%, respectively), despite weekly publication during the bathing season. The current report's text-heavy content with minimally visual format hinders public engagement and comprehension, particularly on mobile devices. In contrast, Ireland's Environmental Protection Agency employs an interactive, user-friendly online platform with maps, detailed beach profiles, and real-time water quality data, significantly enhancing public accessibility and understanding.

To improve Malta's reporting, this study recommends adopting International Organisation for Standardisation (ISO) standards on usability (ISO 9241-11:2018), information presentation (ISO 9241-112:2017), and software accessibility (ISO 9241-171). Implementing these standards would enhance the clarity, accessibility, and inclusivity of bathing water quality reports, thereby increase public engagement, facilitating better-informed health decisions. In contrast, respondents do not frequently visit official government websites or social media platforms to obtain information regarding the quality of recreational bathing water or check beach conditions before swimming. This finding contrasts with data from the National Statistics Office on ICT Usage by Households (2023) (National Statistics Office, Labour Market and Information Society Statistics Unit, 2023), which identifies access to information as the second most popular online activity after communication, encompassing a wide range of activities such as civic and political participation, professional engagement, and other online services.

Experiencing Health issues: Minor health issues were experienced at Ghar Lapsi, Marsascala, St Julians and Xlendi. Spearman bivariate correlation analysis revealed low significant positive correlations between the experience of health issues and four official bathing sites in Malta and Gozo. One site, St Julians showed a low significant correlation at the 0.01 confidence level, while Ghar Lapsi, Marsascala, and Xlendi exhibited significant correlations at the 0.05 confidence level.

No closures were recorded between 2022 and 2023 at Ghar Lapsi, Marsascala, or Xlendi. However, St Julians experienced three temporary closures due to elevated Escherichia coli (E. coli) and intestinal enterococci (IE) levels exceeding national regulatory thresholds. Notably, the St Julians site was closed from May 16th to 22nd, 2022, following a blockage near a local pumping station that caused significant water contamination (E. coli: 34,659 cfu/100ml; IE: 6,581 cfu/100ml). Subsequent closures occurred between August and October 2023 due to similar microbial contamination issues. All closures were promptly communicated to the public via Environmental Health Directorate press releases, with reopening notices issued once water quality met acceptable standards. These findings underscore the importance of ongoing monitoring and rapid response to protect public health at popular bathing sites.

Impact of Personal Characteristics: The findings suggest a low significant positive correlation between Age and the desire to have information boards and car parks at beaches. A comparative analysis of respondents' age groups and preferred beach facilities revealed low but significant positive correlations between age and the preference for parking facilities ($r = 0.106^{*}$) and information boards ($r = 0.174^{**}$). These findings suggest that older individuals tend to prioritise parking availability, likely reflecting greater reliance on private vehicles, and prefer physical information boards over digital sources for beach-related information.

Supporting this finding, parking facilities were ranked as the second most desired amenity (57%), indicating that improved parking infrastructure could enhance visit frequency. This aligns with Lu et al. (2020), who emphasise that effective parking systems encourage elderly participation in social activities. Similarly, the preference for physical information boards corresponds with lower technology use among older adults, consistent with Fischer et al. (2014), who identify barriers to technology adoption in elder populations. The analysis also showed that demographic factors such as age, gender, and education did not significantly influence visit frequency. Instead, improvements in personal beach experience factors, such as companionship, health and safety information, toilet facilities, parking, and information boards along with increased awareness, are key to encouraging more frequent visits. Lastly, the study highlights the importance of bilingual (Maltese and English) signage at beaches to ensure accessibility and comprehension by both local and foreign visitors, thereby enhancing public safety and visitor satisfaction.

Conclusions

This study, which targeted members of St John Ambulance and Rescue Malta and their relatives, utilised a quota sampling method to collect data from 400 respondents, achieving a margin of error of ±4.8% for an undetermined population. The survey instrument encompassed four thematic sections addressing demographic characteristics, recreational bathing water, health issues, and general concerns. The research objectives reflected by the identified research questions were comprehensively fulfilled, underpinned by a high response rate that strengthens the validity and reliability of the findings. The study employed rigorous methodological approaches, incorporating both face and content validity to ensure the relevance and clarity of the questionnaire. Statistical analyses, including descriptive statistics and Spearman bivariate correlations, facilitated the examination of relationships between variables, thereby enriching the interpretative depth of the results.

The underrepresentation of respondents aged over 56 years constrains the generalisability of the findings across age groups, and may reflect accessibility barriers or differential beach usage patterns. Furthermore, the inclusion of participants affiliated with the St John Ambulance and Rescue Malta, which is an organisation with environmental operational responsibilities, may have introduced response bias. Time constraints precluded extensive engagement with older populations through local outreach, which may have otherwise enhanced the comprehensiveness of the data. Despite widespread internet access and a general awareness of hygiene regulations and beach safety protocols, the study identified critical gaps in public understanding of key aspects of recreational bathing water monitoring. These include limited familiarity with water quality reports, monitoring programme details, and official bathing site classifications. Addressing these deficiencies through targeted public education and enhanced communication strategies is imperative to improve awareness, informed decision-making, and public health outcomes in the context of recreational bathing water.

Recommendations

This study presents practical recommendations to improve recreational bathing water quality and public awareness in Malta, including enhancing beach user experience. Based on the respondents' feedback the practical recommendations including:

a) Short-Term (within 1 year):

- Implement educational campaigns in schools and short courses for older adults on bathing water safety.
- Enhance communication by simplifying press releases, explaining beach closures clearly, and using infographics.
- Broaden public outreach via multiple social media platforms and traditional media to reach wider audiences.
- Improve signage at official bathing sites with QR codes and stronger closure barriers for public safety.

b) Long-Term (1–2 years):

- Create an interactive real-time map and app showing water quality, jellyfish alerts, weather, and closures.
- Install smart digital information boards at bathing sites with live updates and amenity info.
- Develop email and SMS subscription services for personalised bathing water notifications.

These initiatives seek to improve public health, awareness, and beach user experience in Malta. Furthermore, a longitudinal study is proposed for future research to monitor and analyse changes in public perceptions and behaviours over time. As Arnold et al. (2011) highlight, repeated measures in longitudinal designs facilitate the investigation of developmental processes and variations across key periods. Applying this approach to recreational bathing waters in the Maltese Islands would enable researchers to assess temporal trends in water quality conditions and public awareness, as well as to identify emerging issues requiring attention.

Acknowledgement

I would like to express my sincere gratitude to my supervisor for his unwavering dedication, continuous support, and insightful guidance throughout the course of this research. I am also deeply thankful to the Non-Governmental Organisation, St. John Ambulance and Rescue, for granting me the opportunity to conduct the survey among their members and their families. I also extend my heartfelt appreciation to all those who, in one way or another, contributed to and supported me in the pursuit of my studies.

Conflict of Interest

The author is currently employed within the Food Safety and Security Authority. At the time this dissertation was undertaken, the author was employed within the Environmental Health Directorate, specifically in the Food Safety section. Although this research concerns the Environment section of the Environmental Health Directorate, the author had no involvement in the Bathing Water Program during the study period. The author is also a member of St John Ambulance and Rescue, the organisation in which the survey was conducted. This affiliation did not influence the study's design, data collection, analysis, or interpretation of the findings.

Authorship

Ms Denise Chetcuti – 50%
Dr Emanuel Camilleri – 50%

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12 When Time Is Tight: Decision-Making in the Armed Forces of Malta

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Abstract

Objectives: In this article, a specific mechanism in stressed military decision-making within the Armed Forces of Malta is investigated: how time pressure is found to shift choices from analytic to intuitive modes, with the pathway moderated by leadership control (micromanagement versus bounded autonomy) and mitigated by communication brevity. Focus is placed on how uncertainty is perceived and responded to in real-time decision-making by military personnel.

Methods: Six semi-structured interviews with mid-rank AFM officers were re-analysed using thematic analysis. Three connected themes were identified: time pressure, leadership control, and communication form. Disconfirming cases were actively sought, and analytic memos with exemplar quotations were maintained.

Results: Under time pressure, attention tightened around the most salient cues and decisions moved faster into intuitive mode. This effect was worse with micromanagement and lighter with bounded autonomy, which improved cue discrimination and kept tempo up. In short, when the clock is tight, processing load rises and performance depends heavily on context—especially a leadership climate that grants clear intent and room to act, and brief, high-salience communication that helps teams align quickly and accurately.

Conclusions: A practical model is proposed in which time pressure elevates cognitive load and promotes intuitive decision modes; leadership control either exacerbates or buffers this load; communication brevity acts as a protective factor. Training should include progressive exposure to time pressure, leaders should apply minimum-necessary control, and units should drill short, salient communications. Virtual reality can provide safe, repeatable, high-tempo practice for a small, neutral force.

Keywords: decision-making under stress; time pressure; micromanagement; communication; Armed Forces of Malta

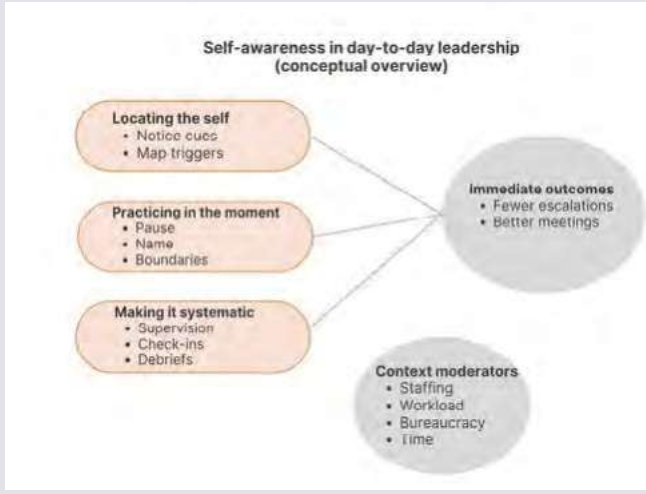

Figure 1 Graphical Abstract - Self-awareness in day-to-day leadership (conceptual overview)

Highlights:

- Employs a qualitative, theme-based analysis drawing on narrative accounts of military personnel, capturing lived practices of emotional intelligence.
- Explores the impact of decision-making under stressful conditions when engaging in military duties.
- Provides evidence-based recommendations for policymakers and organisational leaders to design systems that safeguard military personnel while meeting service pressures and exigencies.

Introduction

1.1 Problem and purpose

Small forces operate in a condition of structural compression: persistent time pressure, thin manpower, and limited training terrain are not episodic aberrations but the normal operating envelope. In the Armed Forces of Malta (AFM), this compression is compounded by constitutional neutrality, maritime responsibilities at the EU's southern border, and a compact organisational footprint. These characteristics intensify well-known decision challenges—cognitive overload, coordination frictions and uneven exposure to complex scenarios—while limiting access to the expansive training estates and role specialisation available to larger militaries. In such ecologies, the conventional advice to "do more analysis" can be ill-posed: time is not merely scarce; it is the currency of survival and legitimacy.

Taking this context into consideration, broad catalogues of "factors affecting military decisions" risk diluting practice into lists rather than actionable strategies. Contrastingly, a mechanism-first approach promises sharper interventions, namely, to identify a tractable causal pathway, to acknowledge its principal moderators/mitigators, and then to design training, leadership and communication around that pathway. The pathway chosen here is time pressure to decision mode (a shift from slower, analytic evaluation to faster, intuitive responding), in recognition that time pressure pushes decisions from analytic to intuitive modes. In parallel with this, leadership control and communication can act as levers that can increase or reduce the cognitive load of working against the clock. This narrowing down of possible influencing factors was adopted as a deliberate trade-off and aligns with the economic concept of ceteris paribus (other things being equal): other determinants—such as fatigue, technological usability, SOP currency, and team familiarity—were bracketed to isolate the time-pressure effect on decision mode and to clarify how leadership control and communication form condition that pathway. A Standard Operating Procedure (SOP) is a concise, written, step-by-step instruction set that standardises how a task is performed so it is done consistently, safely, and correctly.

A more technical reading accepts that the abstraction has limits. Intuition is not inherently error-prone: with deep, representative experience, recognition-primed decisions can move a unit to a better point on the speed–accuracy frontier (i.e., satisficing under bounded rationality). Nor is full analysis always feasible: under severe time compression, working-memory limits and rate–distortion constraints make exhaustive comparison counterproductive and risk missing narrow operational windows (Calin, 2024, Edmunds, Harris & Osman, 2022). The model is therefore conditional: leadership control moderates cognitive load (micromanagement raises it; bounded autonomy buffers it), and communication brevity mitigates load only when common ground and shared mental models are in place. In tightly coupled, high-hazard episodes—or with novice teams—closer supervision may be the safer choice even at the cost of throughput; when common ground is thin, ultra-concise messages under-serve information needs (a media-richness mismatch), driving ambiguity and re-work. The practical aim is not to privilege one pole (intuitive vs analytic; tighter vs looser control; brief vs rich comms) but to enable regime switching: make the appropriate mode available on demand given time budget, coupling, hazard, and team expertise.

Two rival explanations for the link between time pressure, decision mode, and performance are worth noting. Expertise: very experienced officers can deliver high-quality intuitive decisions even under extreme time pressure, so brevity may look effective when the real driver is skill. Procedural scaffolding: up-to-date, well-designed SOPs let people act quickly without sacrificing quality; if terse messages sit alongside strong SOPs, the gains may come from the procedures, not the brevity. Naming these rivals fits the mechanism-first, ceteris paribus narrowing: it prevents over-attributing effects to leadership or communication and keeps attention on cause, not just co-variation. Of course, even after allowing for skill and SOP currency, limits remain. High hazard and tightly coupled decisions (e.g., weapons release) may legitimately require tighter control and richer communication than routine navigation or crowd management (Barrett & Smith, 2017; Flood & Keegan, 2022)). In short, speed should not be equated with quality; the goal is to avoid defaulting to any single thinking style and to be better placed to judge fitness-for-task under real operational constraints.

1.2 Focused research question

The research question asks how military personnel perceive and respond to uncertainty in decision-making, approached here by examining how time pressure drives a shift from analytic to intuitive decision-making among AFM officers, and how that shift is moderated by leadership control and mitigated by communication brevity.

Time pressure is taken as a compression of available decision time that constrains cue search, deliberation, and consultation (e.g., short search-and-rescue windows, interdiction timelines, and rapidly deteriorating weather). Decision mode refers to the dominant strategy evident in action reports. Analytic choices involve deliberate comparison and explicit option evaluation, while intuitive choices rely on pattern recognition and brief mental simulation with truncated option generation. Leadership control is treated as a continuum from micromanagement (frequent top-down directives on sub-tasks) to bounded autonomy (clear commander's intent and explicit guardrails enabling delegated choice). Communication brevity denotes short, task-cued messages that reduce parsing demands—effective when sufficient common ground and shared mental models exist. As pointed out earlier in this paper, for clarity of mechanism, a ceteris paribus stance is adopted. Other determinants (e.g., fatigue, tech usability, SOP currency, team familiarity) are bracketed to isolate the time-pressure pathway and its moderation/mitigation.

1.3 Theoretical framing

Under time pressure, cognitive workload rises, and decision-makers tend to shift from slower, analytic reasoning to faster, intuitive judgement. Leadership style alters this load: close, directive control (micromanagement) increases it, whereas clearly stated intent with delegated discretion (bounded autonomy) reduces it.

Communication design also matters since briefly expressed salient messages lower the effort required to make sense of and parse information – if they are easier and quicker for the brain to decode and interpret, they help preserve decision quality. These effects are not uniform; the pattern varies with officers' expertise, the quality and currency of SOPs, and the nature of the task, especially where coupling and hazard are high. Framed this way, abstract theory becomes a set of practical design levers—how much to control, how to phrase and time messages, and how to structure procedures and training—so that sound decisions remain feasible when time is scarce. However, this type of situational-awareness accounts relates to the idea that performance depends on what operators notice, how they make sense of it and what they project will happen next under load. Yet awareness is too often inferred post hoc from outcomes. It tends to over-centre the individual, neglecting how leadership climate and communication routines shape what is noticed and shared.

Accordingly, the analysis presented in this paper treats individual cognition and organisational ergonomics together, emphasising how structures and practices set the effective cognitive load. Dual-process and recognition-primed perspectives predict a tilt toward pattern-based judgement as time compresses, but this only works to advantage when experience is broad and representative. It also recognises that limited operational exposure and repetitive training terrain (as tends to be a common practice in small forces) increases certain risks. These include the risk that intuitions become over-tuned to familiar patterns (overfitting) and the risk that informal workarounds are gradually accepted as normal practice (normalisation of deviance). This makes it necessary (particularly for small forces) to broaden scenario repertoires and stage stress exposure so that rapid decisions rest on well-calibrated pattern recognition. That said, there isn't a one-size-fits-all. Newer teams and high-risk, tightly linked tasks can reasonably call for more supervision and more detailed communication. A contingency approach is therefore warranted, whereby leadership control should tune the effect of time pressure on cognitive load, while concise, task-cued communication would be employed when teams already have strong common ground and shared mental models.

Methodology

Directed content analysis was adopted (Hsieh & Shannon, 2005) to enable a focused re-examination of interview data from officers of the Armed Forces of Malta (AFM). This approach preserved the contextual richness of the original accounts while allowing a hypothesis-led analysis of the mechanism of interest: how time pressure shifts decision mode, and how leadership control (moderator) and communication brevity (mitigator) condition that shift. The design was chosen to illuminate meaning-making in practice, rather than to estimate population parameters.

Participants were six mid-rank officers (captains) drawn from operational units. A purposive–convenience strategy was used to recruit personnel with routine exposure to time-critical decisions. Responsibility level was held relatively constant to support analytic coherence, while operational contexts were varied to broaden coverage of decision environments. For relatively homogeneous groups, thematic sufficiency is often reached with ~6–12 interviews, which informed the sampling rationale (Guest, Bunce, & Johnson, 2006). Semi-structured interviews (≈30–40 minutes) were conducted to elicit recent decision episodes, salient time-pressure triggers, leadership interactions, and communication practices. With consent, interviews were audio-recorded, transcribed verbatim, and de-identified at transcription; brief field notes captured contextual cues for interpretation.

Transcripts were then coded using a directed scheme aligned to the proposed mechanism—time pressure, leadership control (micromanagement vs. bounded autonomy), and communication form (brevity/salience vs. volume)—while remaining open to inductive subthemes. This enabled a direct test of the moderated–mitigated pathway from time pressure to a shift in decision mode (analytic to intuitive). Constant comparison and targeted negative-case analysis were used to probe rival explanations (e.g., expertise and SOP currency). A maintained codebook and analytic memos formed the audit trail, and cross-case synthesis assessed whether the pattern held across interviews. Ethical approval was granted by the Idea College ethics board, with permission from AFM human-resources management. Given a small, closely knit community, enhanced anonymity measures were applied: role categories were masked; quotations were lightly paraphrased where necessary to prevent deductive disclosure; and all data were stored on encrypted drives with restricted access. Participants received written information sheets, provided informed consent, and were offered a withdrawal window after transcript review.

Results

Building on the interpretivist design and the moderated–mitigated framework set out earlier, the analysis addresses the research question by tracing how time pressure shifts decision mode and how leadership control and communication form, respectively, moderate and mitigate that shift. Re-coding of six AFM interviews around these constructs yielded three interlocking findings.

As illustrated in Figure 1, time pressure emerged as the dominant stressor shaping the mode of choice. Under acute deadlines, attentional scope narrowed to the most salient cues, and officers frequently adopted an act-and-adjust posture: they committed rapidly based on pattern recognition and refined that course as additional information arrived. Where the temporal window permitted even a brief analytic pause—typically 60–90 seconds—judgements were more robust and subsequent corrections fewer.

A recurrent micro-mechanism was evident across narratives: time compression heightened urgency, curtailed cue search and option generation, and increased reliance on familiar patterns, producing faster initial commitment but greater variance in outcome quality. These observations are consistent with a systematic bias towards intuitive responding under time pressure and point to the practical value of engineered pause points within tight operational cycles. A participant explained that: "when the time frame was tight, I went straight to what looked right and adjusted on the move. If I got even a minute to pause, the plan held better."

Leadership style clearly moderated the cognitive load associated with time-compressed decisions. Micromanagement, which could manifest, for instance, as frequent top-down overrides and real-time instruction in minor actions, expanded demands for both juniors and seniors. This deprived the juniors of space for recognition and mental simulation. It may also divert the seniors from higher-level coordination (D'Alessio et al., 2024). By contrast, bounded autonomy, which was characterised by clear intent, explicit guardrails and minimal intervention, preserved junior cognitive bandwidth, accelerated tempo and improved cue discrimination. Under comparable temporal constraints, units operating with bounded autonomy reported fewer stalls, fewer late reversals and tighter alignment between intent and action than those characterised by micromanagement. This pattern supports the proposition that leadership control amplifies or attenuates the time-pressure effect on decision mode posited in the research question. A participant explained that "from my perspective, when HQ started calling in step-by-step, my headspace shrank. With clear intent and room to act, I could see more cues and keep tempo."

Variation in communication form complemented these moderation effects. High-volume, multi-channel updates saturated working memory and encouraged confirmation dynamics, as recipients preferentially registered material congruent with the prevailing plan. Teams that trained short, salient, task-cued messages—typically a single line specifying actor, action, location and timing—achieved faster convergence on a shared picture and required fewer re-briefs; pre-agreed phrasebooks were particularly effective in cross-unit tasks. Operationally, brief and unambiguous messaging reduced the effort required to parse information, freeing cognitive resources for cue discrimination rather than message decoding. One of the participants said "the clarity of the instructions saved us three re-briefs on that task. We knew what we were supposed to be doing. This energised us." The mitigation effect that the participant is alluding to accords with the expectation that message design can partially offset the load imposed by time pressure, provided sufficient common ground exists within the team. Collectively, the results indicate that time pressure drives an analytic–intuitive shift, leadership control modulates its cognitive cost, and concise communication helps to contain that cost—together furnishing an empirically grounded answer to the research question.

Discussion

These results cohere into a compact account: time pressure raises cognitive load and pushes decisions toward intuitive modes; leadership control determines how heavy that load becomes; and communication design can offset part of it. Crucially, this is a moderated–mitigated pathway whose effects vary with expertise, the currency of procedures, and task coupling/hazard. The value is practical: rather than urging people to "think harder," this paper proposes the identification of organisational levers such as how much to control, how to speak, and how to structure practice, and consequently, make it more likely that high-quality decisions are delivered at tempo (Endsley, 1995; Kahneman, 2011; Klein, 1998). This synthesis sits well with existing thinking. Work on situational awareness links performance to how people notice, make sense of, and anticipate cues, but it can drift into post-hoc, individualised explanations. That is why it helps to pair situational awareness with organisational ergonomics—the structures, procedures, and message designs that shape cognitive demands upstream (Wickens, 2008; Weick & Sutcliffe, 2007).

This study is small-N and interpretivist, based on retrospective accounts, so recall bias is possible. To check how far the findings generalise, a mixed-methods follow-up is recommended: combine communication logs with latency/error data, then run field trials to test whether leadership control and message design actually reduce cognitive load and improve decision quality (Weick & Sutcliffe, 2007; Salas et al., 2009; Salas, Rosen & DiazGranados, 2010; Rizzo et al., 2011). The simple pathway to test is that when time is tight, mental load rises and decisions tilt toward intuition; micromanagement amplifies this, bounded autonomy softens it, and short, task-focused messages help ensure speed does not undermine quality.

Practical, low-cost steps (compatible with Malta's neutrality) follow from this: train by progressively dosing time pressure and using clear cues to switch between fast and slow thinking; adopt minimum-necessary control—replacing routine micromanagement with intent-based, bounded autonomy, supported by mentored autonomy and clear decision-rights; and standardise concise communications (short, high-salience phrasing, closed-loop checks, hazard markers), using richer detail until common ground is firm.

Complementarily, simulation and Virtual Reality (VR) can be used to multiply safe, repeatable practice in time-critical scenarios by letting units rehearse the exact stresses they face—without real-world risk. Scenarios can be varied and replayed (e.g., tighter SAR windows, deteriorating weather, and unexpected overrides) to dose time pressure in controlled steps, while data capture (timings, errors, and comms logs) supports precise after-action reviews. VR also allows rapid swaps between leadership control styles (micromanagement vs. bounded autonomy) and communication formats (brief, task-cued vs. verbose), so teams can see how these levers change performance. Because environments are scriptable and consistent, skills can be tested against identical benchmarks, and rare/high-hazard events can be practiced safely and often. This makes training more cost-efficient, scalable, and evidence-driven, aligning with recommendations to broaden scenario repertoires, vary stressors, and institutionalise feedback (Meichenbaum, 2007; Salas et al., 2009; Salas, Rosen & DiazGranados, 2010; Edmunds, Harris & Osman, 2022).

Conclusions

This study shows that when time is tight, AFM officers tend to shift toward intuitive (recognition-primed) decision-making.]Leadership control can either raise or reduce the associated cognitive load, and brief, task-focused communication helps—but only when teams share sufficient common ground. Under time pressure, "fast" thinking can be adaptive with deep experience, yet it is vulnerable to over-tuned intuitions and the normalisation of deviance (Klein, 1998; Kahneman, 2011; Vaughan, 1996). Leadership and communication shape the coordination burden: bounded autonomy preserves cognitive bandwidth, micromanagement inflates load, and short, task-cued messages with closed-loop checks support a shared picture—though brevity can backfire where common ground is weak (Hannah et al., 2009; U.S. Army, 2019; Baddeley, 2003; Cannon-Bowers, Salas & Converse, 1993; Kanki & Palmer, 1993; Degani & Wiener, 1993; Gawande, 2009; Daft & Lengel, 1986). Notably, much of the wider evidence base comes from large, well-resourced settings; small forces remain under-studied. By focusing on the AFM, this paper addresses that gap and points to practical, low-cost levers—minimum-necessary control, concise task-cued comms, and progressive training under time pressure—that can reduce avoidable error without sacrificing tempo.

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Conflict of Interest

The authors declare no conflict of interest

Authorship

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Fostering Innovation Through Academia-Industry Collaboration
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Date: June 13th, 2025 | Venue: Salini Resort, Salina Bay, Malta | Host: IDEA College, & IDEA Consulting | Theme: Connecting Researchers with Industry Professionals to Foster Innovation

Introduction

The **"Research Symposium 2025,"** hosted by IDEA College & IDEA Consulting in Malta, successfully brought together academics and industry leaders on June 13th, 2025, for a day dedicated to exploring cutting-edge research and fostering collaborative opportunities. The symposium aimed to bridge the gap between theoretical insights and practical applications, ultimately driving innovation across various sectors. The day featured insightful research presentations, a dynamic panel discussion, and dedicated networking opportunities.

Proceedings

9:00 - 10:30 AM: **Opening Session**
Dr. Silvio De Bono, Chairman, IDEA Group, officially opened the symposium.

Dr. De Bono, Chairman of the IDEA Group, set the stage by emphasizing the critical role of robust research in addressing contemporary challenges and highlighted the IDEA Group's commitment to nurturing an environment where academic inquiry directly contributes to industry advancement and societal benefit. He emphasized the importance of dialogue and partnership between educational institutions and the professional world in translating knowledge into tangible solutions.

10:30 - 11:00 AM: **Coffee Break**

11:00 - 12:15 PM: **Academic Studies & Discussion**

Part 1
This session showcased diverse research exploring critical issues with direct relevance to Maltese society and beyond.

Dr. Nadine Delicata presented her research on "Barriers to critical thinking in healthcare: an assessment from the perspective of hospital leadership."[1]Dr. Delicata's study shed light on systemic and organizational challenges that may impede critical thinking skills among healthcare professionals, offering valuable insights for improving patient care and clinical decision-making. The discussion highlighted the need for leadership support and continuous professional development in fostering a culture of critical inquiry within healthcare institutions.

Fiona Vella presented "The Maltese perspective on diversity and inclusion in the local fashion industry."[2]Ms. Vella's study explored the current state of diversity and inclusion within Malta's burgeoning fashion sector. Her research offered valuable insights into perceptions and practices, advocating for more inclusive approaches to representation and opportunity within the industry.

1 Delicata, Nadine (2023) Barriers To Critical Thinking In Healthcare: An Assessment: From The Perspective Of Leadership In A Maltese Hospital. The IDEA Journal of Applied Research, V.2, paper No. 05, pages 74 - 87. https://mt.ideaeducation.com/app/uploads/2024/01/Journal-2023-compressed.pdf
2 Vella, Fiona (2025) The Maltese perspective on diversity and inclusion in the local fashion industry. The IDEA Journal of Applied Research. In-Press.

Claudine Balzan shared findings from "Nurses' behaviours towards the implementation of information technology systems: a pilot study in a qualitative inquiry."[3]Ms. Balzan's pilot study examined the human factors influencing the adoption and effective use of IT systems by nurses. Her research insights highlighted the importance of user-centric design, comprehensive training, and addressing resistance to change for successful technological integration in healthcare settings.

11:00 - 12:15 PM: **Academic Studies & Discussion**

Part 2
This session continued with compelling research presentations, further demonstrating the breadth and depth of inquiry at IDEA College.

Josephine Ebejer Grech presented "Fostering resilience in post-secondary students: exploring educators' and students' perspectives on skills to manage workloads and deadlines."[4]Ms. Ebejer Grech's research provided a dual perspective on the challenges faced by post-secondary students in managing academic demands. Her findings offered practical strategies for educators and students alike to cultivate resilience, promote effective time management, and mitigate academic stress.

Jaclyn Magrin discussed "Work values of public and private sector employees on the small-island of Gozo." [5]Ms. Magrin's comparative study offered unique insights into the differing work values prevalent among employees in Gozo's public and private sectors. Her research contributed to a deeper understanding of workforce motivations and expectations in a distinct insular context.

Claudienne Harb shared a poignant qualitative analysis on "The breast cancer survivor's relationship with clothing and fashion after treatment: a qualitative analysis into a rehabilitation jou rney into reconstructing a woman's identity." [6]Ms. Harb's sensitive research explored the profound impact of breast cancer treatment on survivors' perceptions of their bodies and identity, as mediated through their relationship with clothing and fashion. Her findings underscored the therapeutic potential of fashion in the rehabilitation journey and the reconstruction of self-image.

12:15 - 1:15 PM: **Panel Discussion & Plenary - Academia and Industry**

The symposium culminated in a dynamic panel discussion, "Academia and Industry," which provided a platform for experts from both sectors to share their perspectives on practical applications of research and the critical importance of cross-sector collaboration.

3 Balzan, Claudine (2022) Nurses' Behaviours Towards the Implementation of Information Technology Systems: A Pilot Study in a Qualitative Inquiry. The IDEA Journal of Applied Research, V.1, paper No. 7, pages 90 - 102. https://mt.ideaeducation.com/app/uploads/2023/10/Idea-Journal-1-Dec22-V2.pd

4 Grech, Josephine Ebejer (2025) Fostering resilience in post-secondary students: exploring educators' and students' perspectives on skills to manage workloads and deadlines. 8th International Conference on Advanced Research in Education (EDUCATIONCONF). Oxford, UK. 27-29 March 2025. https://www.dpublication.com/wp-content/uploads/2025/03/101-EDU-6185.pdf

5 Magri, Jaclyn (2022) Work Values of Public and Private Sector Employees on the small-island state of Gozo. The IDEA Journal of Applied Research, V.1, paper No. 3, pages 38 - 53. https://mt.ideaeducation.com/app/uploads/2023/10/Idea-Journal-1-Dec22-V2.pdf

6 Harb, Claudienne (2025) The breast cancer survivor's relationship with clothing and fashion after treatment: a qualitative analysis into a rehabilitation journey into reconstructing a woman's identity. The IDEA Journal of Applied Research. In-Press.

The esteemed panelists included:

Dr. Anne Cini – Semi-retired (Academic), Nurse: Offering a wealth of experience from both academic research and practical nursing, Dr. Cini provided insights into the real-world impact of healthcare research.

Dr. Flavia Morone – Professor & Researcher, IDEA College: Representing the academic perspective,

Dr. Morone articulated the value of foundational research and the potential for educational institutions to serve as incubators of innovation. She highlighted that applied research is crucial in healthcare settings as it translates scientific findings into real-world solutions, directly impacting patient outcomes, operational efficiency, and policy development.

Ing. Malcolm Zammit – Sr Principal R&D Engineer, Baxter Healthcare: Bringing an industry perspective from the cutting-edge of medical technology, Ing. Zammit discussed the practicalities of translating research findings into commercial products and solutions.

Ms. Ritianne Borg Saliba – Director General, Educational Services: Ms. Borg Saliba provided a broader governmental and educational perspective, highlighting policy implications and the importance of fostering a research-aware workforce from early stages.

Ms. Roseanne Calleja – Head of Credit, Mizzi Organisation: Representing a major diversified business group, Ms. Calleja underscored how data and research inform strategic business decisions and credit risk management.

The discussion covered themes such as identifying industry needs, facilitating knowledge transfer, overcoming barriers to collaboration, and the shared responsibility of academia and industry in driving sustainable innovation and economic growth in Malta and beyond. The plenary session allowed for active audience engagement and questions.

1:15 - 1:30 PM: **Closing Session**

Dr. Nadia Maria Vassallo, Principal, IDEA College, delivered the closing remarks.

Dr. Vassallo, Principal of the IDEA College, expressed gratitude to all presenters, panelists, attendees, and the organizing committee for a successful symposium. She reiterated IDEA College's commitment to fostering a vibrant research culture and strengthening its ties with industry partners. Dr. Vassallo emphasized that the ideas generated and connections forged during the symposium would serve as a catalyst for future collaborative endeavors, reinforcing IDEA College's role as a hub for innovation.

1:30 - 2:30 PM: **Lunch & Networking**

The symposium concluded with a networking lunch, providing an informal setting for attendees to continue discussions, forge new connections, and explore potential collaborations arising from the day's insightful presentations and discussions. The lively atmosphere underscored the success of the symposium in its primary aim of connecting researchers with industry professionals to foster innovation.

Symposium Takeaways:

- **The Need for Cross-Sector Collaboration**: Presenters emphasized the importance of collaboration with academia to address complex challenges and drive innovation. They emphasized the need for interdisciplinary research.
- **The Importance of Research in Driving Decisions:** Presenters highlighted the role of research in driving business decisions by providing data-driven insights that inform strategic planning, enhance understanding of customers and markets, and ultimately lead to more effective and successful outcomes.
- **The Need for Workforce Development and Skills Training:** Presenters emphasized the need for workforce development and skills training to address labour shortages and ensure the adoption of new technologies.

Future Directions

The symposium concluded with a call to action, emphasizing the need for continued collaboration between academia and industry to drive innovation and address complex challenges.

Acknowledgments:

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We would like to express our gratitude to the IDEA Consulting team for their active involvement and enthusiasm in fostering meaningful connections and exchanges among attendees.

We would like to express our profound gratitude to notable IDEA members: Dr. Silvio De Bono, Chairman, IDEA Group, Ing. Vince Maione, Deputy Chairperson, IDEA Group, Dr. Sonia Galea, Deputy Principal (Academic Affairs), IDEA College, and Mr. Alexei De Bono, Chief Operating Officer, IDEA Group, for elevating the level of discussions and contributing significantly to the symposium's success.

The Journal of Applied Research

01 Organisational Culture Effects on Job Satisfaction among Different Generations in a Healthcare Setting
- Claudine Balzan

02 Assessing the Engagement Levels of Electrocardiography Technicians Working in Mater Dei Hospital
- James Azzopardi & Dr Flavia Morone

03 Emotional Intelligence in Effective Leadership within the Maltese Social Sector: A Qualitative Study
- Shelley Galea Spiteri & Dr Damian Spiteri

04 The Acceptance of Robotic Systems for Nursing Care at St. Vincent De Paul: A Quantitative Study
- Anne Marie Fava, Kurt Grixti & Dr Karl Spiteri

05 Challenging the Obstacles in Pre-Analytical Settings: Exploring Frequency, Types, and Sources of Preanalytical Errors in Blood Sampling Practice
- Graziella Santillo & Dr Emanuel Camilleri

06 Validating HOSPITAL Score for 30-Day Readmission and Mortality in Older Adults Discharged to Long-Term Care
- Dr Sephora Santucci, Mr Emanuel Schembri, Dr Tracy Lee Vidal & Dr Karl Spiteri

07 The Empowerment of Elderly Individuals Regarding the Risk of Falls (TEEI-FALLS) Tool: Translation to English and Maltese and Cross-Cultural Validation
- Flavia Cristina Morone Pinto, Lara Muscat, Simone Souza de Freitas, Regina Celia de Oliveira Eliane, Maria Ribeiro de Vasconcelos, Nadia Maria Vassallo

08 Student Support Services in a UK Further–Higher Education College: Institutional Perspectives
- Dr Rosetta Thornhill & Dr Damian Spiteri

09 Learners' Perspectives of Inclusive Practices of a Public Higher Vocational Education Provider in Malta
- Dr Rosetta Thornhill & Dr Damian Spiteri

10 Transgender Adults' Perceptions of Residential Long-Term Care in Malta: Implications for Inclusive Practice
- Natasha Gilson & Dr Damian Spiteri

11 Recreational Bathing Water in Malta: A Cross-Sectional Survey of Awareness, Information Use, and Perceived Risks
- Denise Chetcuti & Dr Emanuel Camilleri

12 When Time Is Tight: Decision-Making in the Armed Forces of Malta
- Kieran Laws & Dr Damian Spiteri

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