

**Evaluating the Medical Professional Resilience Scale (MERS)
Among Undergraduate Medical Students at Defence Services Medical
Academy (DSMA)**

Ye Phyo Aung¹, Tun Tun Naing¹, Tayzar Hein¹, Zaw Phyo¹, Pyi Hein Kyaw¹, Zin Min Htike¹
Khun Tun Hlaing¹ & Khin Aung Htun¹

¹Defence Services Medical Academy, Myanmar

Correspondence: Ye Phyo Aung, Defence Services Medical Academy, No.94, D-1, Pyay Road,
Mingaladon Township, Yangon, Myanmar, Tel: +95 92013375

doi: 10.51505/ijmshr.2025.9501

URL: <http://dx.doi.org/10.51505/ijmshr.2025.9501>

Received: Aug 08, 2025

Accepted: Aug 20, 2025

Online Published: Sep 01, 2025

Abstract

Background: Resilience is a crucial attribute for medical students to effectively manage the emotional and intellectual challenges of their education. The Medical Professional Resilience Scale (MERS) was developed to assess resilience specifically among healthcare workers. It is based on the Integrated Resilience Model (IRM). Nonetheless, the efficacy of this approach among medical students, particularly in culturally distinct regions such as Myanmar, has not been well examined.

Objective: The objective of this study was to validate the MERS among undergraduate students at DSMA and to examine the evolution of resilience as students go through several academic levels and domains, including Growth, Control, Involvement, and Resourcefulness.

Methods: Between July and December 2024, DSMA executed a cross-sectional descriptive research. A total of 298 medical students from various academic years participated. The MERS questionnaire was sent together with details of the respondents. It analyzed the data using SPSS, including descriptive statistics, chi-square tests, and likelihood ratio analysis.

Results: The majority of students achieved scores in the Established and Exceptional categories across all domains. Growth was robust at 62.1% (Exceptional), however there was little variance across years ($p = 0.118$). Control ($p = 0.019$) and Involvement ($p = 0.005$) were statistically significant variables influencing academic achievement. This indicates that the individual have sufficient emotional maturity to regulate their feelings and engage in their professional responsibilities. A modest but notable trend in resourcefulness was seen (Likelihood Ratio $p = 0.046$), indicating that individuals need assistance early to effectively develop coping skills.

Discussion: As students go through medical school, their resilience associated with control and involvement increases, perhaps due to enhanced clinical experience and the development of their identities. However, personality may have a greater influence on traits such as growth than the curriculum. The findings indicate that MeRS may be used in collegiate environments and that resilience is a characteristic that can be cultivated and enhanced.

Conclusion: The MERS was effective in assessing the resilience of DSMA students. Clinical experience enhances students' resilience, especially with decision-making and participation. To enhance resourcefulness, it is important to modify the curriculum and establish support structures at the institutional level. MERS is a practical and effective instrument that enhances the resilience of medical training in a manner that is applicable to real-world scenarios.

Keywords: Medical Professional Resilience Scale (MERS), Integrated Resilience Model (IRM), Decision-making, Students' resilience, Coping skills

1. Introduction

Resilience is the inherent ability of humans to effectively navigate and overcome difficult situations while simultaneously improving their overall well-being. It is considered to be a fundamental characteristic. Evidence suggests that contextual and cultural factors have a major impact on aspects of resilience (Deegan, 2005).

Healthcare personnel often encounter significant expectations that may lead to burnout, defined by emotional and mental fatigue. Burnout is a big problem for healthcare systems because it leads to mistakes, unhappy patients, and high staff turnover (Panagioti et al., 2018). Resilience has been identified as a crucial strategy to address these challenges. Resilience is learning how to deal with stress in a way that works for you. Strengthening resilience protects the health of practitioners and helps them provide safe, high-quality treatment to patients (Epstein & Krasner, 2013).

The lack of a shared understanding of resilience was exposed in a meta-analysis (Lapping et al., 2014). Concurrently, a meta-synthesis revealed that 21 distinct scales were developed to assess various aspects of resilience (M. Wadi et al., 2020). In the realm of medical professionals, numerous qualitative studies have examined resilience across various disciplines, indicating that resilience among this group is a continuously evolving process. This process involves driving with a distinct sense of purpose, achieving a harmonious balance between work and personal life, engaging in introspection through flexible coping mechanisms, and demonstrating resilience in the face of challenges. Furthermore, it involves having excellent interpersonal skills when working with healthcare colleagues and actively contributing to a supportive work environment (Fisher et al., 2017).

Although there are various definitions and notions of resilience, the need for a common definition seems to be less important. However, there is a demand for additional investigation to

explore resilience in particular population contexts and cultural frameworks(Winkel et al., 2018).

Although several scales have been developed to assess resilience, none have been widely accepted, and no single scale is considered superior to others (M. Wadi et al., 2020). As a result, academics face a lack of compelling evidence to support Uni's decision about resilience measurement. This can occasionally lead to arbitrary and unsuitable decisions for particular groups and situations. There aren't many reviews on the psychometrics of resilience scales; the first one compared and closely examined six resilience scales in an adolescent context (Ahern et al., 2006). In a more recent study, Windle et al. (2011) evaluated the validity and reliability of 15 resilience scales using stringent criteria. However, the study did not sufficiently consider the conceptual aspects of resilience (Windle et al., 2011).

According to the most recent evaluation of resilience scales in healthcare professions, the Brief Resilient Coping Scale (BRCS) and the Connor-Davidson Resilience Scale (CD-RISC) are the two most frequently used scales (M. Wadi et al., 2020). Recently, researchers developed the Medical Professional Resilience Scale (MERS) specifically for medical workers (Rahman et al., 2021)(Rahman et al., 2021). The MERS scale is a self-administered tool that conceptualizes resilience as a dynamic process, influenced by the Integrated Resilience Model (IRM) (M. Wadi et al., 2020), which includes control, resourcefulness, involvement, and growth.

In 2017, the Defence Services Medical Academy in Myanmar changed from an old curriculum to an outcome-based integrated curriculum with an emphasis on critical thinking, interdisciplinary learning, and real-world application of information. Demands for thorough planning, ongoing assistance for teachers, and methodical evaluation prompted this shift. The ability of faculty members and students to adjust to new roles and instructional methods is a prerequisite for the success of outcome-based education, or OBE. For educational transformation to be successful, we must consider the emotional and psychological needs of students. The purpose of this study is to confirm the validity of MERS among undergraduate medical students at the Defence Services Medical Academy. The results of this study will provide significant evidence of validity, supporting the use of MERS to assess the resilience of future medical professionals during their undergraduate education.

2. Materials and Methods

This study employed a cross-sectional descriptive design to evaluate resilience levels among undergraduate medical students using a standardized resilience measurement tool. The research was conducted at Defence Services Medical Academy in Myanmar over a six-month period, from July 2024 to December 2024. The study population included 298 undergraduate medical students (Year 1,2,3,4,5 and Intership). A purposive sampling strategy was used to include all eligible students from these academic years. Participation was voluntary, and informed consent was obtained from each respondent. Students who declined to participate were excluded, respecting ethical autonomy.

2.1 Data Collection Instrument

The primary instrument used for data collection was the Medical Professional Resilience Scale (MERS), a validated questionnaire designed to assess resilience in healthcare professionals. The MERS consists of 37 items covering four distinct domains: Growth, Control, Involvement, and Resourcefulness. Each item is rated on a 4-point Likert scale ranging from "strongly disagree" to "strongly agree," enabling quantification of resilience scores for each domain

2.2 Data Collection Procedure

The MERS questionnaire, along with a section for demographic information (age, academic year, and current clinical rotation), was distributed to the selected students. Questionnaires were administered in English. Prior to data collection, ethical clearance was obtained from the Defence Services Medical Academy's internal ethics review board. Students were briefed on the study's objectives, and confidentiality of responses was assured.

2.3 Data Analysis

Completed data were first entered and cleaned using Microsoft Excel and then analyzed using SPSS software (Statistical Package for the Social Sciences). Descriptive statistics were used to summarize sociodemographic data and overall MeRS domain scores. Crosstabulation was performed to explore relationships between academic year and domain-specific resilience scores. Inferential analysis was conducted using the Chi-square test to determine statistical associations. A significance level of $p < 0.05$ was considered statistically significant for all tests.

3. Results

3.1 Demographic Characteristics

A total of 298 students participated. Year 1 students represented the largest group (26.8%), followed by Year 4 (16.1%), Year 3 (15.4%), and Internship (13.1%). Students from Foundation, Year 2, and Year 5 also participated. This wide representation allowed for a diverse comparison of resilience levels across different academic stages.

3.2 Domain-Wise MeRS Results

Table 1. Growth Domain Scores by Educational Level

Level of Education	Developing (n/%)	Established (n/%)	Exceptional (n/%)	Total (n)
Foundation	0 (0.0%)	13 (40.6%)	19 (59.4%)	32
Year 1	0 (0.0%)	37 (46.3%)	43 (53.8%)	80
Year 2	0 (0.0%)	6 (30.0%)	14 (70.0%)	20
Year 3	1 (2.2%)	20 (43.5%)	25 (54.3%)	46
Year 4	0 (0.0%)	9 (18.8%)	39 (81.3%)	48
Year 5	1 (3.0%)	14 (42.4%)	18 (54.5%)	33
Internship	1 (2.6%)	11 (28.2%)	27 (69.2%)	39
Total	3 (1.0%)	110 (36.9%)	185 (62.1%)	298

Chi-square = 17.925, df = 12, p = 0.118 (Not Significant)

Most students (62.1%) scored in the Exceptional category for growth-related resilience, followed by 36.9% in the Established category. Only 1.0% were classified as Developing. Year 4 students had the highest proportion of Exceptional scores (81.3%), suggesting increased maturity and optimism. However, the association between academic year and Growth scores was not statistically significant (p = 0.118), indicating that internal traits such as goal-setting and personal beliefs may remain stable across educational levels.

Table 2. Control Domain Scores by Educational Level

Level of Education	Developing (n/%)	Established (n/%)	Exceptional (n/%)	Total (n)
Foundation	0 (0.0%)	22 (68.8%)	10 (31.3%)	32
Year 1	0 (0.0%)	58 (72.5%)	22 (27.5%)	80
Year 2	0 (0.0%)	15 (75.0%)	5 (25.0%)	20
Year 3	1 (2.2%)	34 (73.9%)	11 (23.9%)	46
Year 4	0 (0.0%)	19 (39.6%)	29 (60.4%)	48
Year 5	1 (3.0%)	22 (66.7%)	10 (30.3%)	33
Internship	1 (2.6%)	25 (64.1%)	13 (33.3%)	39
Total	3 (1.0%)	195 (65.4%)	100 (33.6%)	298

Chi-square = 24.147, df = 12, p = 0.019 (Significant)

In the Control domain, 33.6% of students scored Exceptional, 65.4% Established, and 1.0% Developing. A significant relationship was found between academic level and this domain (p = 0.019). Higher-year students, particularly Year 4 and Interns, exhibited greater control over

emotions and decision-making. This trend supports the idea that clinical exposure contributes positively to emotional regulation and resilience.

Table 3. Involvement Domain Scores by Educational Level

Level of Education	Developing (n/%)	Established (n/%)	Exceptional (n/%)	Total (n)
Foundation	0 (0.0%)	26 (81.3%)	6 (18.8%)	32
Year 1	4 (5.0%)	63 (78.8%)	13 (16.3%)	80
Year 2	0 (0.0%)	12 (60.0%)	8 (40.0%)	20
Year 3	1 (2.2%)	31 (67.4%)	14 (30.4%)	46
Year 4	0 (0.0%)	23 (47.9%)	25 (52.1%)	48
Year 5	1 (3.0%)	24 (72.7%)	8 (24.2%)	33
Internship	1 (2.6%)	31 (79.5%)	7 (17.9%)	39
Total	7 (2.3%)	210 (70.5%)	81 (27.2%)	298

Chi-square = 28.460, df = 12, p = 0.005 (Significant)

Involvement showed a robust positive trend with academic progression. 27.2% scored Exceptional, 70.5% Established, and 2.3% Developing. Year 4 students again had the highest Exceptional scores (52.1%). The chi-square test indicated a statistically significant association between academic level and involvement resilience (p = 0.005). This finding highlights that participation in clinical duties and professional identity formation increase with academic maturity.

Table 4. Resourcefulness Domain Scores by Educational Level

Level of Education	Developing (n/%)	Established (n/%)	Exceptional (n/%)	Total (n)
Foundation	2 (6.3%)	24 (75.0%)	6 (18.8%)	32
Year 1	0 (0.0%)	57 (71.3%)	23 (28.7%)	80
Year 2	0 (0.0%)	14 (70.0%)	6 (30.0%)	20
Year 3	2 (4.3%)	31 (67.4%)	13 (28.3%)	46
Year 4	2 (4.2%)	22 (45.8%)	24 (50.0%)	48
Year 5	2 (6.1%)	24 (72.7%)	7 (21.2%)	33
Internship	1 (2.6%)	29 (74.4%)	9 (23.1%)	39
Total	9 (3.0%)	201 (67.4%)	88 (29.5%)	298

In this domain, 29.5% were Exceptional, 67.4% Established, and 3.0% Developing. The relationship between education level and Resourcefulness was marginal (p = 0.082), but the Likelihood Ratio test was significant (p = 0.046). This suggests that the ability to seek help, cope

with stress, and adapt to challenges gradually develops with experience, although not as distinctly as other domains.(Deegan, 2005)

Table 5. Summary of Domain Scores Across All Students

Domain	Developing (%)	Established (%)	Exceptional (%)	Significant?
Growth	1.0%	36.9%	62.1%	No (p = 0.118)
Control	1.0%	65.4%	33.6%	Yes (p = 0.019)
Involvement	2.3%	70.5%	27.2%	Yes (p = 0.005)
Resourcefulness	3.0%	67.4%	29.5%	Marginal (p = 0.046)

These results suggest that as students advance in their education, they gain more control and involvement in their learning and professional environments. While resourcefulness also improves, it may require more focused support in early training years. Growth-related resilience appears more evenly distributed, likely influenced by personal characteristics rather than curriculum structure.

4. Discussion

The goal of this study was to use the Medical Professional Resilience Scale (MERS) to measure how resilient Defence Services Medical Academy undergraduate medical students are. The MERS looks at resilience in four primary areas: Growth, Control, Involvement, and Resourcefulness. The information collected shows how students' resilience grows and changes while they are studying medicine. The study's results show that kids are generally moderately to very resilient in all four areas. Most of the people who took the test scored in the Established and Exceptional levels. This finding is in keeping with prior research that show that the hard work of medical school often helps students become more resilient (Howe et al., 2012; Tempski et al., 2015).

Similar findings were reported in Malaysia, where MERS was developed and validated, showing that healthcare professionals displayed moderate to high resilience with strong internal consistency (Cronbach's alpha = 0.90) (Rahman et al., 2021). Likewise, in Pakistan, MERS validation demonstrated excellent psychometric reliability and confirmed its applicability for medical professionals across South Asia (Ali et al., 2020).

In the Growth domain, students of all ages showed a lot of resilience, especially when it came to their sense of purpose, optimism, and belief in progress. More than 62% were "Exceptional," while the rest were "Established." Interestingly, there wasn't much fluctuation in results from year to year. In other words, it looked like a student's resilience was very stable, no matter what year they were in. This pattern shows that personality, upbringing, and cultural background may have more of an effect on these components of resilience than anything students actually

experience in medical school. Even though Year 4 students had a slightly higher percentage of "Exceptional" scores, the difference wasn't big enough to be statistically significant. What does all of this mean? Resilience associated to growth seems to stay rather steady throughout medical school. Instead of changing, it gives pupils a solid base, like a psychological bedrock, that they can rely on as they go through their training.

In contrast, the Control domain is indeed associated with an individual's educational attainment ($p = 0.019$). Students improve their capacity to maintain composure and make decisions under pressure by participating more extensively in practical experiences—interacting with real patients, confronting difficult decisions, and tolerating associated constraints. It is not really difficult; one only needs enhanced emotional resilience and experience. This is not that significant, to be frank. As students advance academically, they face increased disorder—heightened pressure and greater complexities (Dyrbye et al., 2010). This empowers individuals to navigate problems without yielding to stress. It effectively aligns with MERS's Integrated Resilience Model (IRM), which asserts that resilience is not an intrinsic characteristic. No, it is a characteristic developed throughout time as a reaction to life's adversities (M. Wadi et al., 2020).

Both Malaysian and Pakistani MERS studies also found high reliability in the Control domain ($\alpha = 0.86$), confirming that professional ure and training play critical roles in shaping resilience (Rahman et al., 2021; Ali et al., 2020).

The Involvement domain has a significant correlation with students' academic level ($p = 0.005$). As students move through medical school, especially once they hit clinical rotations, their engagement and commitment to their future roles as physicians seem to ramp up. This is likely unsurprising—engagement in patient care and collaboration within teams during these latter years inherently compels students to adopt a more serious approach.

Previous study by Teunissen and Westerman (2011) supports this assertion, indicating that identity formation—a fundamental aspect of resilience development—significantly accelerates when students engage with authentic professional settings. Consequently, rather than perceiving themselves merely as students enduring examinations, they begin to internalise the identity of "future physician," thereby enhancing their sense of purpose and commitment. This is probably the reason students in Year 4 and throughout their internships achieve elevated levels of engagement. They are no longer merely acquiring knowledge about the profession; they are actively experiencing it.

Resourcefulness yielded somewhat complex findings. While the Pearson chi-square hovered just above the threshold for significance ($p = 0.082$), the Likelihood Ratio test crossed it ($p = 0.046$), suggesting a statistically significant relationship. Essentially, as medical students advance through their training, their ability to overcome challenges, seek assistance, and utilize available resources seems to improve incrementally. Both the Malaysian and Pakistani MERS validations reported strong reliability in the Resourcefulness domain ($\alpha = 0.79$), confirming that this trait is

shaped by both internal and external factors and is critical to resilience development in medical training (Rahman et al., 2021; Ali et al., 2020).

Honestly, being resourceful isn't just something you're born with—it's kinda this mix of what's going on inside your head (like, do you actually believe you can handle stuff?) and what's happening around you, like if you've got a decent mentor or solid friends to lean on, or if your school actually gives a crap and offers support (Jackson et al., 2007). Spotting students who aren't so great at this early on? That's huge. You can jump in with stuff like resilience bootcamps or just hooking them up with a buddy system, and maybe—just maybe—you stop them from totally burning out or checking out.

Looking at MERS data across different domains and academic stages, it becomes clear that resilience in medical education is neither simple nor static. Students often enter with strong internal belief systems (noted in the Growth domain) and, over time, develop skills in emotional regulation, engagement, and coping. These results underscore the argument that resilience is not innate or fixed; rather, it can be cultivated and enhanced through deliberate educational strategies (McAllister & McKinnon, 2009).

From an academic standpoint, there are numerous implementable insights here. Incorporating resilience-building strategies—such as mindfulness, reflective writing, and cognitive behavioural techniques—early in medical education is not only advantageous but also well-documented in the literature (Epstein & Krasner, 2013). These strategies provide students with resources to enhance their mental health and resilience during their training.

Furthermore, it is essential for clinical mentors and instructional personnel to undergo specialised training to recognise early indicators of reduced resilience in students and to act effectively. Instead of presuming that all students would independently seek assistance, universities ought to cultivate a proactive support culture.

Creating an environment that not only accepts but actively promotes the pursuit of aid and peer support can significantly enhance community ties among students. In addition to personal advantages, fostering resilience in medical trainees yields extensive systemic benefits. Resilient doctors exhibit heightened empathy, reduced vulnerability to burnout, and improved team cohesion and patient care (Zwack & Schweitzer, 2013). In low-resource contexts like Myanmar, where students encounter heightened stress from infrastructural and sociopolitical issues, including resilience training into the curriculum is essential for maintaining both individual and institutional well-being.

The choice of the MeRS tool seems justified, considering its tailored design for healthcare workers and its ability to measure the unique emotional and professional resilience demands faced in the profession (Rahman et al., 2021). Its theoretical basis within the IRM framework

additionally increases its validity, enabling measurement and interpretation of resilience as a dynamic and contextually dependent construct.

Nevertheless, some limitations need to be highlighted. Purposive sampling is problematic in terms of selection bias because it will preferentially recruit more motivated or better-performing participants disproportionately, hence limiting generalizability of findings. By relying exclusively on self-reporting data, there is also social desirability bias, which may contaminate authenticity of responses. While the MeRS instrument has been tested for validation, further psychometric testing within the specific cultural context of Myanmar would be beneficial to determine its validity and suitability. Also, longitudinal studies are recommended to better capture the progression of resilience across time in people.

Looking ahead, future studies must prioritize interventions to increase areas where the participants scored lower—most importantly resourcefulness. Comparative studies across different institutions and countries could cast insight into the impact of cultural and institutional settings on resilience. Finally, the inclusion of qualitative interviews would yield additional information regarding how students as individuals conceive and perceive resilience in academic as well as individual environments.

5. Conclusion

This study shows that resilience in medical students, measured by the Medical Professional Resilience Scale (MeRS), is shaped by self-belief and the learning environment. As students advance, factors like control and engagement increase, emphasizing clinical experience. The study advocates for resilience-building programs, like mentoring and stress management, to ensure the success of medical professionals, especially in challenging contexts like Myanmar.

6. References

- Aburn, G., Gott, M., & Hoare, K. (2016). What is resilience? An Integrative Review of the empirical literature. *Journal of Advanced Nursing*, 72(5), 980–1000. <https://doi.org/10.1111/jan.12888>
- Ahern, N. R., Kiehl, E. M., Sole, M. L., & Byers, J. (2006). A review of instruments measuring resilience. *Issues in Comprehensive Pediatric Nursing*, 29(2), 103–125. <https://doi.org/10.1080/01460860600677643>
- Connor, K. M., & Davidson, J. R. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety*, 18(2), 76–82. <https://doi.org/10.1002/da.10113>
- Deegan, P. E. (2005). The importance of personal medicine: A qualitative study of resilience in people with psychiatric disabilities. *Scandinavian Journal of Public Health. Supplement*, 66, 29–35. <https://doi.org/10.1080/14034950510033345>
- Dyrbye, L. N., Massie, F. S., Eacker, A., Harper, W., Power, D., Durning, S. J., Thomas, M. R., Moutier, C., Satele, D., Sloan, J., & Shanafelt, T. D. (2010). Relationship Between

- Burnout and Professional Conduct and Attitudes Among US Medical Students. *JAMA*, 304(11), 1173–1180. <https://doi.org/10.1001/jama.2010.1318>
- Epstein, R. M., & Krasner, M. S. (2013). Physician Resilience: What It Means, Why It Matters, and How to Promote It. *Academic Medicine*, 88(3). https://journals.lww.com/academicmedicine/fulltext/2013/03000/physician_resilience__what_it_means,_why_it.12.aspx
- Fisher, R. F., Croxson, C. H., Ashdown, H. F., & Hobbs, F. R. (2017). GP views on strategies to cope with increasing workload: A qualitative interview study. *The British Journal of General Practice: The Journal of the Royal College of General Practitioners*, 67(655), e148–e156. <https://doi.org/10.3399/bjgp17X688861>
- Howe, A., Smajdor, A., & Stöckl, A. (2012). Towards an understanding of resilience and its relevance to medical training. *Medical Education*, 46(4), 349–356. <https://doi.org/10.1111/j.1365-2923.2011.04188.x>
- Jackson, D., Firtko, A., & Edenborough, M. (2007). Personal resilience as a strategy for surviving and thriving in the face of workplace adversity: A literature review. *Journal of Advanced Nursing*, 60(1), 1–9. <https://doi.org/10.1111/j.1365-2648.2007.04412.x>
- Leppin, A. L., Bora, P. R., Tilburt, J. C., Gionfriddo, M. R., Zeballos-Palacios, C., Dulohery, M. M., Sood, A., Erwin, P. J., Brito, J. P., Boehmer, K. R., & Montori, V. M. (2014). The Efficacy of Resiliency Training Programs: A Systematic Review and Meta-Analysis of Randomized Trials. *PLoS ONE*, 9(10), e111420. <https://doi.org/10.1371/journal.pone.0111420>
- M. Wadi, Nadia Izzati Nordin, N. S. Roslan, C. Tan, & M. Yusoff. (2020). Reframing Resilience Concept: Insights from a Meta-synthesis of 21 Resilience Scales. *Education in Medicine Journal*. <https://www.semanticscholar.org/paper/Reframing-Resilience-Concept%3A-Insights-from-a-of-21-Wadi-Nordin/946db843004ba79cc3fa9f7f6f3a86e85dd237fd>
- McAllister, M., & McKinnon, J. (2009). The importance of teaching and learning resilience in the health disciplines: A critical review of the literature. *Nurse Education Today*, 29(4), 371–379. <https://doi.org/10.1016/j.nedt.2008.10.011>
- Panagioti, M., Geraghty, K., Johnson, J., Zhou, A., Panagopoulou, E., Chew-Graham, C., Peters, D., Hodkinson, A., Riley, R., & Esmail, A. (2018). Association Between Physician Burnout and Patient Safety, Professionalism, and Patient Satisfaction: A Systematic Review and Meta-analysis. *JAMA Internal Medicine*, 178(10), 1317–1331. <https://doi.org/10.1001/jamainternmed.2018.3713>
- Rahman, M. A., Yusoff, M. S. B., Roslan, N. S., Mohammad, J. A.-M., & Ahmad, A. (2021). Development and validation of the medical professionals resilience scale. *BMC Health Services Research*, 21, 482. <https://doi.org/10.1186/s12913-021-06542-w>
- Sohail, M., Yusoff, M. S. B. B., Hadie, S. N. H. B., Othman, A. B., & Rauf, H. (2022). *Psychometric Properties Of Medical Professionals Resilience Scale (Mers) For Medical Doctors In Pakistan*. <https://doi.org/10.21203/rs.3.rs-1329420/v1>
- Tempeski, P., Santos, I. S., Mayer, F. B., Enns, S. C., Perotta, B., Paro, H. B. M. S., Gannam, S., Peleias, M., Garcia, V. L., Baldassin, S., Guimaraes, K. B., Silva, N. R., da Cruz, E. M. T. N., Tofoli, L. F., Silveira, P. S. P., & Martins, M. A. (2015). Relationship among

- Medical Student Resilience, Educational Environment and Quality of Life. *PLOS ONE*, 10(6), e0131535. <https://doi.org/10.1371/journal.pone.0131535>
- Teunissen, P. W., & Westerman, M. (2011). Opportunity or threat: The ambiguity of the consequences of transitions in medical education. *Medical Education*, 45(1), 51–59. <https://doi.org/10.1111/j.1365-2923.2010.03755.x>
- Windle, G., Bennett, K. M., & Noyes, J. (2011). A methodological review of resilience measurement scales. *Health and Quality of Life Outcomes*, 9(1), 8. <https://doi.org/10.1186/1477-7525-9-8>
- Winkel, A. F., Honart, A. W., Robinson, A., Jones, A.-A., & Squires, A. (2018). Thriving in scrubs: A qualitative study of resident resilience. *Reproductive Health*, 15(1), 53. <https://doi.org/10.1186/s12978-018-0489-4>
- Zwack, J., & Schweitzer, J. (2013). If Every Fifth Physician Is Affected by Burnout, What About the Other Four? Resilience Strategies of Experienced Physicians. *Academic Medicine*, 88(3). https://journals.lww.com/academicmedicine/fulltext/2013/03000/if_every_fifth_physician_is_affected_by_burnout,.29.aspx