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Resilience and its associated factors in optometry students from eight institutions across six countries

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ABSTRACT

Clinical relevance: Resilience is a key enabler for healthcare professionals including optometrists, to cope with adversities and practice self-care. Evaluating the levels of resilience and its associated factors in optometry students can lead to the development of appropriate intervention strategies for academic and professional success.

Background: The moderately high prevalence of mental health issues and burnout among optometry students suggests a need to equip the next generation of optometrists with the necessary skills to enhance mental health. Resilience has been shown to mitigate burnout among healthcare professionals and offer personal and professional benefits. Additionally, resilience education during healthcare student training can enhance mental health and wellbeing, leading to better patient care. This study aims to evaluate resilience levels and its associated factors (self-efficacy, mindfulness, positive and negative affect, and coping strategies) in optometry students.

Methods: Students enrolled in optometry schools across eight institutions in six countries were invited to participate in an online survey within the period of April 2023 – January 2024. The survey comprised of demographic data, existing and validated questionnaires on resilience, self-efficacy, mindfulness, positive and negative affect, and coping strategies. Descriptive statistics and linear regressions were used for analysis.

Results: A total of 294 valid responses were collected. There were no significant differences in resilience scores between countries. Greater resilience ($p < 0.05$) was associated with older age, higher academic grades and having no financial assistance. Additional predictors of greater resilience included higher self-efficacy, mindfulness, positive affect and acceptance scores, and lower behavioural disengagement scores.

Conclusion: Identifying factors that affect resilience in optometry students provides information for targeted strategies that enhance resilience. More work is required to understand the generalisability of these results, impact of culture on resilience, and appropriate intervention methods.

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Introduction

Mental health and wellbeing issues are significant health problems among tertiary students,[1] with higher prevalence rates observed in healthcare students.[2] Prevalence of depression and anxiety in the United States of America (USA) healthcare student cohorts, which included optometry students were approximately 5.5–17% and 11.5–25.5%.[3,4] An African study with a larger number of optometry student participants reported 58% of depression and 66.1% of anxiety amongst allied healthcare students.[5] Additionally, optometry students in the USA had significantly higher burnout rates (around 70%) compared to faculty (around 10%).[6]

Although no studies have investigated stressors to optometry students leading to mental health and wellbeing issues, previous studies on tertiary students[7–9] indicate that the rigorous training to be a qualified optometrist can be challenging. Stressors can include adaptation to new and complex physical and social environments, increased academic demands and expectations, and financial pressure.[7] Additional stressors include poor motivation, study skills and coping strategies.[8,9] The expectation to be scientifically knowledgeable whilst technically and clinically competent in the clinical environment can also be stressful for healthcare students.[10]

The negative impact of stressors resulting in poor mental health and wellbeing can lead to poor academic performance[7] in students, and decreased clinical performance and poorer patient care in health professionals.[11] These reports highlight the importance of equipping optometry students with the necessary skills to improve personal mental wellbeing, which can lead to enhanced patient care.[12] An important attribute that could be taught and learnt,[13] and

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has been shown to mitigate the negative impact of stress on mental health and prevent burnout, is resilience.[13,14]

Resilience can be described as the ability of an individual to cope with challenging phases of life, and to adapt successfully to the environment.[15] Resilience has been shown to minimise and buffer the negative impacts of workplace stress on mental health, prevent burnout,[13,14] and is increasingly being viewed as a critical graduate capability.[16] Greater resilience levels have also been associated with less stress, better mental health,[17] and improved quality of life.[18]

Whilst resilience in healthcare students such as in medicine and nursing are well studied,[12] there are limited studies involving optometry students, a cohort that will graduate to be optometrists. Cisarik reported that optometry students in the USA demonstrated lower resilience during the coronavirus pandemic as compared to pre-pandemic.[19] Ching and Cheung investigated the resilience levels and predictors of resilience in third-year Hong Kong Polytechnic University optometry students. High self-efficacy, mindfulness, active coping and denial were associated with greater resilience in this optometry student cohort.[20]

In investigating the predictors of resilience, Ching and Cheung had adopted the workforce resilience model developed by Rees and Breen (2015), which predicts factors that have significant relationships with feelings of depression, anxiety, stress, and burnout, via the mediating influence of resilience.[21] In this theoretical and empirically derived model, factors associated with resilience include self-efficacy, mindfulness, positive and negative affect and coping strategies.[21]

Self-efficacy refers to the judgement by an individual of their capability.[22] It has been shown to mediate the relationship between resilience and stress in the work environment,[23] with higher self-efficacy being linked with greater resilience in healthcare practitioners[24] and university students.[25] Mindfulness is the awareness of an individual, about the ongoing internal and external present-moment experiences without nonintentional judgement or reaction.[26] Heightened mindfulness has been significantly associated with greater resilience in university students.[26]

Positive and negative affect refers to the general disposition or mood state that indicates experience of positive[27] and negative[28] emotions across situations of an individual. Maintaining a positive affect can lead to broadening thoughts and actions that are rare, inventive and flexible.[1] These in turn can lead to resilient characteristics, including self-regulation that facilitates a positive response to setbacks.[1] Negative affect or negative emotions can be linked to responses that narrow thoughts and actions in adverse situations, limiting adaptability.[27] Previous studies have linked higher positive affect[1,29] and lower negative affect[1] to greater resilience.

Coping strategies include cognitive and behavioural strategies adopted by an individual when dealing with perceived stressors.[30] Problem-focused coping strategies such as active coping, use of informational support, positive reframing and planning have been associated with lower risk of burnout and improved resilience.[31] Whereas avoidant strategies such as self-distraction, denial, substance use, and behavioural disengagement have been associated with higher risk for burnout and decreased resilience.[32] Emotion-focused strategies such as the use of emotional support, venting, humour, acceptance, religion, self-blame have been found to have differing impact on resilience amongst individuals.[32]

Healthcare professionals including optometrists require resilience to survive and thrive in the workplace,[16,33] supporting the need for enhancing resilience in health professional education.[12] Using the Rees and Breen workforce resilience model,[21] Ching and Cheung identified factors associated with resilience,[20] which could lead to targeted interventions to enhance mental health and wellbeing in optometry students. However, the generalisability of the study is limited to a single institution and a larger cohort study is necessary to improve the understanding of resilience and its associated factors.

The current study aims to evaluate resilience levels and its associated factors (self-efficacy, mindfulness, positive and negative affect and coping strategies) in a larger and more diverse optometry student cohort, as a first step in promoting resilience in optometry students. It is hypothesised that resilience levels are similar across countries, as students are bound by a common professional interest and similar stressors. Additionally, it is hypothesised that predictors of resilience of optometry students would be self-efficacy, mindfulness, active coping and denial as indicated by previous study.[20]

Methods

Study design and procedures

This was a cross-sectional survey study. Participating institutions were from the Asia-Pacific,[34] the United Kingdom and the USA (Table 1). These eight institutions collectively identified resilience as an area that is pertinent in the curriculum. Optometry students aged over 18 were invited to participate via the learning management system or email. The survey was opened for three-weeks with three invitations for each institution.

Participation in the survey was voluntary and anonymous, with non-identifiable responses being collected from April 2023 to January 2024. This study was approved by The University of Melbourne Institutional Human Research Ethics Committee (approval ID 25945).

Survey content

In evaluating resilience in optometry students, the same survey questions in the study conducted by Ching and Cheung that were based on a workforce resilience model[21] were used.[20] This survey was conducted on the Qualtrics survey management software (Qualtrics, Provo, UT) and comprised of demographic data including age, gender, marital status, average academic grade in the previous year, international or domestic student status, current living situation, religious beliefs, responsibility for dependents, financial assistance (including loans and scholarships), and average paid working hours per week.

As academic grading systems differ between institutions, a conversion table matching similar grades was used for data analysis (Supplementary Table 1). Demographic data were collected to identify any possible trends and correlations between demographic factors and resilience levels in the optometry student cohort.

The survey also comprised five study scales, using surveys that have previously been reported to have high validity and internal consistency.[20,31]

Table 1. Participating institutions and countries.

Country	Institution	Course name	Number of years	Australian Qualifications Framework level	Number of invited participants Total: 1386	Number of Responses received Total: 389	Number of valid responses^ Total: 294
Australia	The University of Melbourne	Doctor of Optometry	4	9	271	69	57
China	Hong Kong Polytechnic University	Bachelor of Science (Hons) in Optometry	5	8	200	44	29
India	Elite School of Optometry	Bachelor of Optometry, Master of Optometry	Bachelor – 4 Master – 2	Bachelor – 7 Master – 9	82	58	48
	Manipal Academy of Higher Education	Bachelor of Optometry, Master of Optometry	Bachelor – 4 Master – 2	Bachelor – 7 Master – 9	80	73	63
					162	131	111
Singapore	Ngee Ann Polytechnic	Diploma in Optometry	3	5	44	36	30
	Singapore Polytechnic	Diploma in Optometry	3	5	52	37	29
					96	73	59
The United Kingdom	Aston University	Master of Optometry	4	9	436	41	21
The United States of America	The State University of New York	Doctor of Optometry	4	9	383	31	17

^Invalid responses comprise of participants with incomplete surveys (Australia – 9, China – 15, India – 19, Singapore – 7, The United Kingdom – 20, The United States of America – 15). These invalid responses were excluded from data analysis.

(1) The Connor-Davidson Resilience Scale-10 assesses the ability of an individual to cope with stress and anxiety,[35] and was used as a measure of resilience. Participants respond to 10 statements using a 5-point Likert scale, resulting in possible total scores ranging from 0 to 40, with higher scores indicating greater resilience.
(2) The 10-Item General Self Efficacy Scale assesses the ability of an individual to complete tasks in adverse and stressful situations,[36] and was used as a measure of self-efficacy. Participants respond to 10 statements using a 4-point Likert scale, with possible total scores ranging from 10 to 40. Higher scores are associated with positive attention control, wellbeing, healthy behaviours and coping.[36]
(3) The Cognitive and Affective Mindfulness Scale-Revised assesses individual differences in mindfulness,[37] and was used as a measure of mindfulness. Participants respond to 10 statements using a 4-point Likert scale, with possible total scores ranging from 10 to 40. Higher scores indicate heightened mindfulness.[37]
(4) The 20-item Positive and Negative Affect Scale assesses the extent of positive and negative emotional levels of an individual over the preceding week, and was used to measure emotional resilience.[38] Participants respond to the 20-item (10 positive affect and 10 negative affect) survey, using a 5-point Likert scale, with possible total scores ranging from 10 to 50 for positive and negative affect respectively. Higher scores indicate greater levels of the associated affect.[38]
(5) The 28-Item Brief Cope Scale assesses coping strategies, thus providing insight into the emotional and mental ability of an individual when dealing with stressors.[39] This survey was used to assess the type of coping strategies that individuals adopted. Two questions addressed each of the 14 unique coping strategies including: self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioural disengagement, venting, positive reframing, planning, humour, acceptance, religion and self-blame, yielding 28 questions in total. Participants respond using a 4-point Likert scale, with a total score calculated for each coping strategy. Possible scores range from 2 to 8, with higher scores indicating an increased use of the respective coping strategy.

Data analysis

Data was exported from Qualtrics (Qualtrics, Provo, UT) to Microsoft Excel (Microsoft, 2023) and imported to SPSS (version 29, SPSS Inc., Chicago, Illinois, USA) for analysis. Data from participants with missing data were excluded from the data analysis. Descriptive statistics, which include standard deviations, frequencies and percentages were used to summarise study variables. Results were analysed as a whole cohort. One-way ANOVA with Bonferroni post-hoc analysis were used to determine if resilience scores differed between countries. General linear regression was used to determine the significant predictors of resilience. Results were considered statistically significant if $p < 0.05$.

Results

Participant characteristics

Of 1386 students invited to participate, a total of 389 responses were collected. Ninety-five responses were excluded due to missing data, resulting in 294 valid responses. This number of valid responses was close to the ideal sample size of 301 for a 95% confidence level and 5% margin of error.[40]

Supplementary Table 2 shows the characteristics of 294 participants, with greater responses from India (111/294; 37.8%), Singapore (59/294; 20.1%) and Australia (57/294; 19.4%). Most of the participants were 20–29 years old (73.1%), female (75.5%), single (97.3%), with average academic grades of first class to second class honours division B (25.5–28.2%). Majority of the participants were domestic students (96.3%), living with family (74.8%), with religious beliefs (66.7%), had no family dependents (86.4%), had no financial assistance (53.4%), and did not have paid work (53.1%).

Five study scales

The internal consistencies of all five surveys in this study were high and comparable to previous studies (Suplementary Table 3).

The means and standard deviations for each study scale are shown in Figure 1.

Differences in resilience among optometry students from six countries

Resilience score as a cohort was 24.14 ± 6.30 (mean ± standard deviation). One-way ANOVA revealed that resilience levels varied between countries (F (5, 288) = 2.40, $p = 0.04$). These differences did not reach statistical significance in Bonferroni post-hoc analysis. Resilience scores were 27.65 ± 6.30 (mean ± standard deviation) in the USA, 24.93 ± 6.04 in Australia, 24.76 ± 5.93 in Singapore, 24.76 ± 6.36 in the United Kingdom, 23.21 ± 6.18 in India and 22.34 ± 6.87 in China.

Predictors of resilience

Table 2 shows demographic factors that predicted greater resilience ($R^2 = 0.61$) were older age ($p = 0.03$), higher academic grades ($p = 0.004$), and having no financial assistance ($p = 0.02$). Additional predictors of greater resilience were higher self-efficacy ($p < 0.001$), mindfulness ($p < 0.001$), positive affect ($p < 0.001$) and acceptance ($p = 0.02$) scores, and lower behavioural disengagement scores ($p = 0.048$).

Table 2. General linear regressions to determine the predictors of resilience in optometry students.

	Total (N = 294), R2 = 0.61		
Demographic/Study Scales	B	95% CI	p value
Gender	−0.31	−1.51, 0.89	0.61
Age	1.25	0.13, 2.36	0.03*
Relationship status	−0.38	−3.11, 2.35	0.78
Grade	0.68	0.22, 1.14	0.004*
Student type	−1.04	−3.67, 1.60	0.44
Living situation	0.10	−0.69, 0.89	0.81
Religion	−1.05	−2.31, 0.22	0.10
Dependents	−0.88	−2.44, 0.67	0.26
Financial assistance	1.30	0.21, 2.39	0.02*
Work hours	−0.12	−0.68, 0.45	0.69
Country	−0.06	−0.42, 0.30	0.75
General Self Efficacy Scale	0.69	0.53, 0.84	<0.001**
Cognitive and Affective Mindfulness Scale-Revised	0.25	0.11, 0.39	<0.001**
Positive Affect	0.19	0.10, 0.27	<0.001**
Negative Affect	−0.02	−0.09, 0.06	0.67
Brief Cope Scale			
Self-distraction	0.04	−0.33, 0.41	0.85
Active coping	0.38	−0.09, 0.85	0.11
Denial	−0.13	−0.51, 0.25	0.51
Substance abuse	0.07	−0.35, 0.48	0.74
Use of emotional support	−0.24	−0.67, 0.20	0.29
Behavioural disengagement	−0.46	−0.91, −0.01	0.048*
Venting	−0.10	−0.53, 0.34	0.67
Use of instrumental support	−0.01	−0.45, 0.43	0.97
Positive reframing	−0.13	−0.53, 0.29	0.55
Self-blame	0.29	−0.08, 0.67	0.13
Planning	−0.17	−0.67, 0.34	0.52
Humour	0.07	−0.23, 0.36	0.66
Acceptance	0.51	0.10, 0.92	0.02*
Religion	−0.28	−0.60, 0.03	0.08

*$p < 0.05$; **$p < 0.01$.
Significant predictors of resilience are in BOLD.

Discussion

Optometry students from different countries did not demonstrate differences in resilience scores. Greater resilience was associated with older age, higher academic grades, and having no financial assistance. Predictors of greater resilience also included higher self-efficacy, mindfulness, positive affect and acceptance scores, and lower behavioural disengagement scores.

Resilience of optometry students from six countries

In interpreting the similar resilience levels found across countries in the current study, it is important to consider that despite the lack of cross-cultural studies in healthcare students, resilience levels have been found to vary between countries,[20,41] and greater resilience has been observed in

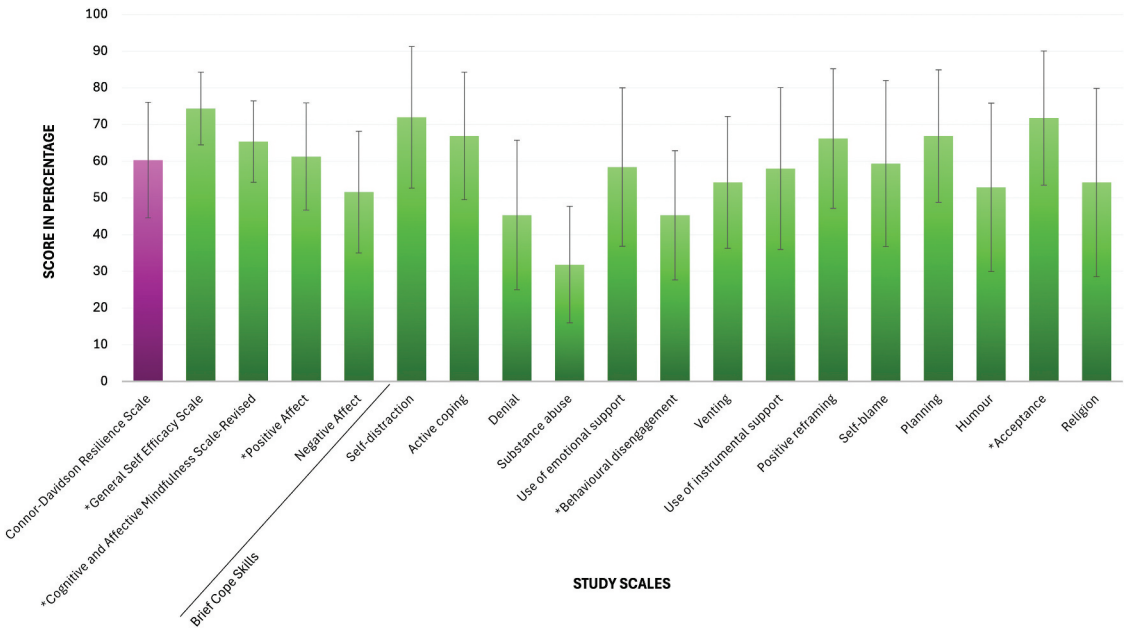

Figure 1. Resilience and its associated factors, means ± standard deviation expressed as percentage for each study scale. *indicates study scale that is a significant predictor ($p < 0.05$) of resilience measured by Connor-Davidson resilience scale-10.

healthcare students from Western countries when compared to students from Asian countries.[20]

The inclusion of Western countries in the current study might have contributed to the slightly higher overall cohort resilience mean score (24.14 ± 6.30) when compared with Hong Kong Polytechnic University third-year optometry students (22.10 ± 6.63), and health sciences students (23.35 ± 5.43) from the study conducted by Ching and Cheung.[20] As the current study has lower response rates from some countries, it is difficult to draw conclusions on the relationship between geographical locations and resilience. Future studies with greater sample sizes across geographical regions will enhance the understanding of this relationship.

There is a possibility that optometry students bound by the same healthcare pursuit face comparable stressors and demonstrate similar resilient levels. This is consistent with a previous study where prevalence of low resilience in healthcare professionals did not differ across geographical regions and settings.[42] Further comparison with USA young adults (18–24 years) from a previous study,[43] shows that optometry students within a similar age range (mostly 18–29 years) in the current study scored lower in resilience. This again suggests the possibility that healthcare students face unique stressors, resulting in lower resilience. Future studies that identify stressors unique to optometry students might elucidate its impact on resilience and lead to appropriate changes to the curricula.

Age and resilience

Consistent with a previous study on Australian tertiary students,[1] older age was found to be associated with greater resilience in the current study. Resilience scores of younger (20–29 years) optometry students (~24.14) in this study were lower than older (~40 years) Singaporean nurses (~27.9–28.6)[44] and paramedics (~30.8–44.4)[45] when measured with the Connor-Davidson Resilience Scale-10. This further demonstrates the strong association between age and resilience. Previous studies have linked resilience in older adults with positive emotions,[46] improved emotional regulation[47] and problem solving skills,[47] Strategies to enhance these factors to improve resilience are discussed below.

Academic performance and resilience

The positive association between grades and resilience is consistent with previous studies.[43,48] In examining longitudinal data in German tertiary students, resilient individuals consistently demonstrated better grades, better life satisfaction, more positive academic trajectories and lower dropout intentions, confirming the positive effect of resilience on academic success.[48] It is likely that highly resilient individuals are better equipped to deal with negative experiences, and are more capable of developing strategies to achieve academic success during professional training.[43] Future studies will be helpful in elucidating the adaptive strategies that students adopt and its effectivity when faced with academic challenges.

Financial assistance status and resilience

Students with no financial assistance demonstrated greater resilience, suggesting the possibility that they might have adapted effectively, enabling them to positively cope with any monetary hardships whilst not receiving financial assistance.[49] Another possibility for the current finding might be that students are from high-income households, with no financial stressors affecting their resilience levels. In support of this hypothesis is an empirical modelling study, where better socioeconomic circumstances in childhood were predictive of resilience in adulthood.[50] Wealthier parents might invest greater financial and/or time resources in the non-cognitive skills in their children, contributing to greater resilience in adulthood.[51]

The current study has grouped loans and scholarships under the same financial assistance category, which does not indicate the level of financial challenges that a student might face. As financial stress can impact on mental health negatively,[52] information about financial hardship and household incomes in future studies might elucidate the role of finances on resilience in the optometry cohort.

Self-efficacy and resilience

Self-efficacy as a predictor for resilience is consistent with previous studies involving healthcare practitioners[24] and university students.[25] Individuals with higher self-efficacy, perceive they can perform well and are more likely to view difficult tasks as something to master rather than avoid, hence is an attribute that promotes resilience. Self-efficacy can be derived from mastery experience, vicarious experience, verbal persuasion, and physiological and affective states.[22]

These four sources can be incorporated in teaching and learning activities to enhance self-efficacy. Simulation training with accompanying pre-briefing and reflection can lead to mastery experience.[53] Vicarious experiences can involve students observing experienced optometrists performing clinical exams successfully via placement settings. Feedback in the form of verbal persuasion encourages students, spurring them to succeed and achieve clinical competency. Altogether, these experiences can lead to positive physiological and affective states that enhance self-efficacy.

Mindfulness and resilience

Heightened mindfulness was found to be associated with greater resilience in the current study. This is consistent with a meta-analysis study that reported a significant association between mindfulness and resilience among university students.[26] As this association was not moderated by cultures and national economic development levels, the relationship between mindfulness and resilience appears to be universal.[26] Additionally, studies of mindfulness programs have been shown to be effective in improving resilience.[54,55] Hence, institutions promoting interventions based on mindfulness might enhance resilience and lower burnout levels[56] in optometry students.

Positive affect and resilience

The finding of positive affect as a predictor of resilience in optometry students agrees with previous studies.[1,29] Although negative affect was not a predictor for resilience in the current study, previous studies have found an association with lower resilience, and that negative affect has a larger impact on mental health outcomes than positive affect.[1] In

tertiary students with lower negative affect, positive affect was found to moderate the relationship between negative affect and resilience to a larger extent than for students with greater negative affect.[1]

Hence, considering the causes of negative affect and providing necessary support is as important as promoting positive affect in improving resilience and well-being, and reducing mental health issues. In enhancing positive affect, institutions can implement programs such as positive psychology interventions[57] that aim at increasing positive feelings, behaviours and cognitions to promote resilience, and increase general well-being.

Acceptance and behavioural disengagement coping strategies, and resilience

Acceptance has been shown to be a common emotional-focused strategy adopted by healthcare students,[58–60] and might reduce anxiety and fear in individuals through finding meaning in difficult circumstances.[61] The findings of this current study is similar to others, where higher acceptance scores were linked with greater resilience in medical students[62] and in an Italian population.[63]

The finding of low behavioural disengagement, an avoidant and maladaptive coping style, being associated with higher resilience scores in this current study is consistent with literature describing the protective effect of resilience in reducing the risk of maladaptive coping behaviours.[56] High levels of behavioural disengagement has also been shown to be linked with low resilience in physicians,[32] and an Italian population,[63] and has been associated with higher stress levels in healthcare students,[58–60] and burnout in physicians.[32] Hence, the low behavioural disengagement of optometry students is an encouraging finding, predictive of greater resilience, lower stress and burnout levels.

Overall, findings of high acceptance scores and low behavioural disengagement being associated with higher resilience in optometry students in this study is consistent with a systematic review paper reporting that healthcare students utilised more problem-focused and emotional-focused coping strategies.[64] In considering interventions to enhance resilience in optometry students, education about different coping strategies, creating awareness about the negative impact of maladaptive strategies and the benefits of positive adaptive coping styles could foster resilience.

Implications

There is increasing recognition of the need to develop and enhance resilience in health professional students.[12,65] Reports of Australian optometrists experiencing increased prevalence of mental health issues (~30% moderate-to-severe depression and anxiety) and burnout (~57%) compared to the general population,[66] support the need to equip optometry students with relevant skills such as resilience to enhance mental health, wellbeing and patient care.

Interventions targeted at specific associated factors of resilience for the optometry student cohort have been discussed earlier. The practical implementation of these interventions in an already crowded curriculum, its effectiveness and sustainability presents challenges and requires further investigations.[67] Utilising innovative teaching and learning approaches to facilitate the enhancement of resilience within the curricula might be helpful to address these challenges and complement explicit teaching of resilience and its associated factors. In addition to simulation training and clinical placements, collaborative learning including interprofessional learning[68] has also been shown to positively impact self-efficacy.

Problem-based learning can be introduced to enhance problem-solving ability and self-efficacy of students.[69] Self-reflection encourages mindfulness and can result in enhanced student critical thinking, self-assessment and problem solving.[70,71] Hence, incorporating self-reflection within the curricula can aid students in learning from their mistakes in clinical practice[72] and enhance resilience.[73] Peer mentoring, which involves students within the same or different year levels working together to support their learning, can be an effective tool in helping students deal with stress, particularly during transition to clinical work.[74]

In considering a multi-faceted approach to promote resilience, educators can increase student awareness of existing mental health support services and wellbeing programs via announcements at the start of each year. Digital platforms that promote resilience and wellbeing have benefits such as being freely accessible, allowing for anonymity and flexibility. Hence, students could be made aware of digital resources that support wellbeing, as well as digital interventions that enhance resilience.[75]

Limitations

A key limitation of the current study is the low response rates and limited representation of institutions from individual countries, limiting the generalisability of the results. Non participation could arise from students not seeing the importance of resilience,[76] highlighting the need to promote resilience and its benefits to students. The limited responses from some countries in the current study prevented detailed analysis of the impact of geographical location with its dominant culture on resilience and analysis across year levels.

Future studies should consider allocating classroom time for survey participation to encourage greater response rates.[20] As resilience levels can vary across time, longitudinal studies and measures across year levels can give insight on how curriculum impacts resilience.[48] The inclusion of burnout and mental health measures would have been helpful in establishing its relationship with resilience, and should be considered for future studies.

Conclusion

This study assessed resilience and its associated factors in a cohort of optometry students across multiple institutions and countries. Through the identification of predictors of resilience, curriculum changes and interventions that enhance resilience, which are specific to the optometry student cohort, could be developed. Future studies can involve larger cohorts and focus groups to understand the generalisability of these results, impact of culture on resilience and appropriate intervention methods.

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