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Exploration of health and health behaviours of undergraduate nursing students: a multi-methods study in two countries

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Background: Nurses play a vital role in health promotion, and there may be a link between a nurse's own lifestyle practices and how they educate others. Supporting health and well-being in student nurses is critical given they will be educating others once registered and practicing. **Objectives:** To explore the health and health behaviours of undergraduate nursing and midwifery students considering the demands of their profession, their public health role and their ability to be role models.

Design: Multi-methods study.

Methods: Undergraduate nursing students in the second and third years of their programme were invited to self-complete a health and health behaviour questionnaire in a Scottish and Australian Higher Education Institution. Qualitative data were collected from a convenience sample of 20 third-year nursing and midwifery students.

Results: Two hundred and thirty-five Scottish students and 113 Australian students, 175 (85%) and 84 (74%), respectively, completed the questionnaire. Some differences and similarities were noted across groups, in particular, perceived physical health, the prevalence of binge drinking, smoking and being overweight/obese and some dietary measures were found to be less favourable among Scottish students. There were worryingly high levels of poor mental well-being at both higher education institutions, with scores on a mental well-being scale suggesting that (82) 34.7% of Scottish students and 33 (29.6%) of Australian students were at risk of depression. Nine Scottish students and 11 Australian students were interviewed. Key contributors and barriers to healthy behaviours were noted across both groups of students in relation to lifestyle. Students perceived that certain elements of their curriculum had implications on their ability or motivation to make healthy lifestyle choices.

Conclusion: The poor health and health behaviours of future nurses need to be addressed in their higher education to shape resilient role models for future nursing practice.

Impact Statement: Priority should be given to supportive learning environments for student nurses that foster emotional support and encourage healthy lifestyles.

Keywords: nurse; student; health behaviour; curriculum; health promotion

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Introduction

The role of a nurse is evolving internationally. With future nurse standards calling for nurses to be more actively engaged in the prevention of ill health and public health measures (Nursing & Midwifery Council [NMC], 2018), nurses now play a key part in influencing public health through health promotion. It has been reported that the personal practice of healthy lifestyle choices for nurses can enhance the success of influencing their patients' health behaviours (McDowell et al., 1997; Radsma & Botorff, 2009). It is therefore vital that nursing curricula evolve in harmony with this developing role of the nurse, particularly given recent evidence that has identified high levels of obesity in nurses compared with other health professionals (Giviria et al., 2017; Kyle et al., 2016). Within nursing programmes, prospective nurses acquire the theoretical basics of health promotion. While this knowledge and understanding may generate positive aspirations to practise healthy behaviours, the academic and practical demands of this unique university course could have a negative effect, with the health behaviours of some students worsening over this period (Bryer et al., 2013).

Numerous international studies have examined the health behaviours of nursing students and have demonstrated wide variations. In Spain and Colombia, there was a high prevalence of poor sleep and insufficient physical activity levels, with moderate smoking and alcohol consumption (Rodriguez-Gasquez et al., 2017). In Ireland, smoking and excessive alcohol consumption were high, yet physical activity levels were more favourable (Burke & McCarthy, 2011). Similarly, research reported in Iran, Hong Kong and Thailand has demonstrated generally poor health behaviours among nursing students (Rezaei-Adaryani & Rezaei-Adaryani, 2012), with sub-optimal levels of physical activity (Choi-Hui, 2002; Klainin-Yobas et al., 2015). Research to date amongst student nurses in Scotland suggested that smoking, diet and sleep behaviours were key areas of concern to address among nursing students (Evans et al., 2019). Given the future roles of nurses, it seems evident that nursing programmes should consider means of developing and encouraging good lifestyle practices among students, while they are a captive audience to shape into public health minded nurses of the future.

Study Aim & Design

The aim of the study was to determine how students' health behaviours are affected and what factors influenced these behaviours. In this multi-methods study, we examine the results of a survey of health and health behaviours among nursing undergraduate students at two higher education institutions (HEIs) in Scotland and Australia, and use qualitative data to explore the implications of their course requirement and public health role on their health behaviours. In particular, we were interested in whether the characteristics of their educational institution or professional programme had an influence on students' health or health behaviours. Pursuing the study further to examine the differing institutional and international approaches to supporting health behaviours within this group. The main difference between education provision in the two HEIs is that students at the Scottish HEI attend 8–12 week blocks of full-time clinical placement sessions, whereas the majority of the course at the Australian HEI involves a weekly mix of theoretical content with practice placement sessions. Furthermore, students are allocated into problem-based learning (PBL) groups of about 12–16 students with whom they remain for the duration of the course, in comparison to Scottish students who generally learn in large cohorts of up to 300 students. However, it should be noted that these models are specific to the two institutions studied and may differ across other HEIs.

Methods

This multi-methods study comprised a self-report questionnaire and in-depth qualitative interviews among groups of students at two HEIs. A questionnaire was disseminated to second-year undergraduate students (adult field and mental health) in a Scottish HEI (in September 2017) and those (nursing and dual nursing/midwifery) in an Australian HEI (in February 2018) during their first week of teaching, following participant information leaflets provided 48 h in advance. The questionnaire was adapted from one used among students at a UK institution as part of a Healthy University Project (Deniozou, 2015), containing seven sections relating to physical activity, eating habits, sleep, alcohol, smoking, mental health and markers, with a combination of open and semi-structured questions. The researchers were present during the session to address any queries or concerns. The questionnaires were self-anonymised by the students who were asked to develop their own unique 12-digit alpha-numeric identifier on their questionnaire but not to give any information that would make them identifiable. Complete details of the questionnaire are described elsewhere (Evans et al., 2019).

Table 1. Questions on the questionnaire used to derive measures of health.

	Question	Responses
Physical health	How would you rate your general physical health?	Excellent / Very good / Good / Fair / Poor
Mental health	How would you rate your general mental health?	Excellent / Very good / Good / Fair / Poor
Physical activity	In a normal week, on how many days are you physically active for a total of 30 min or more?	0–2 days / 3–4 days / 5 or more days
	Have you been physically active for at least two and half hours in total over the course of the past week?	Yes / No
	How healthy do you consider your eating habits to be?	Very healthy / Healthy / Average / Unhealthy / Very unhealthy
	Do you have breakfast most days of the week?	Yes / No
	How many portions of fruit and vegetables do you eat on a typical day?	0, 1, 2, 3, 4, 5, 6 or more
	How often do you have a take-away, or eat in a fast-food restaurant (e.g. McDonalds) for one of your main meals (breakfast, lunch or dinner)?	Every day / Most days / Once or twice a week / Occasionally (less than once per week) / Never
	BMI	What is your weight? What is your height?
Sleep	How well do you sleep?	Very well / Well / Average / Badly / Very badly
	How many hours of sleep do you get on an average night?	Less than 4 / 4–6 / 7–8 / 9–10 / More than 10
Alcohol	Do you consume alcoholic drinks?	Yes – every day / Yes – most days / Yes – once or twice a week / Yes – only occasionally / No – never
	How often have you had 6 (if female)/8 (if male) or more alcohol units on a single occasion?	Never / Less than monthly / Monthly / Weekly / Daily or almost daily
Smoking	Which of the following statements best describes you?	I have never smoked / I used to smoke but I have given up / I smoke every day / I smoke but not every day

The questions from the questionnaire that were used for this analysis are presented in [Table 1](#). The measures of health derived from answers to these questions are presented in [Table 2](#). The Warwick–Edinburgh Mental Wellbeing Scale (WEMWBS) was also administered (Warwick Medical School, 2018). This is a validated 14-item tool with statements relating to mental well-being on a Likert scale, and a possible score ranging from 14 to 70. A cut-off score of <46 is taken to be indicative of being at high risk of major depression, or at high risk of psychological distress and increased risk of depression. Chi-squared tests were carried out to compare proportions between students at the two HEIs.

Qualitative data were collected from students in their final year at the same HEIs using in-depth semi-structured interviews to explore their health and health behaviours and the factors that they thought influenced them. These students would have been included in the study population for questionnaire completion, but the anonymous nature of the questionnaire meant that whether they completed the questionnaire was not known. A convenience sample of 20 students was recruited: eleven Australian students (nursing and dual nursing/midwifery) and nine students

Table 2. Comparison of health measures between students at Scottish and Australian HEIs.

		Scottish HEI <i>n</i> = 175 ^a	Australian HEI <i>n</i> = 84 ^a	
Physical health	No (%) who reported physical health as excellent or very good	32 (18.3%)	29 (34.5%)	$\chi^2 = 8.31$ $p < 0.01$
Mental health	No. (%) who reported mental health as excellent or very good	62 (36.0%)	31 (37.8%)	$\chi^2 = 0.02$ $p = 0.89$
Physical activity	No. (%) achieving 150 min of physical activity weekly	143 (81.7%)	60 (71.4%)	$\chi^2 = 3.54$ $p = 0.06$
Diet	No (%) having a very healthy or healthy diet	46 (26.3%)	42 (50.0%)	$\chi^2 = 14.23$ $p < 0.01$
	No (%) having breakfast most days	61.7%	72 (85.7%)	$\chi^2 = 15.42$ $p < 0.01$
	No. (%) having at least five portions of fruit and vegetables on a typical day	22 (12.6%)	18 (20.2%)	$\chi^2 = 3.41$ $p = 0.06$
	No. (%) having takeaway meals at least weekly	75 (43.1%)	30 (35.7%)	$\chi^2 = 1.28$ $p = 0.26$
BMI	No (%) having a BMI of <20 (underweight)	12 (9.0%)	23 (29.1%)	$\chi^2 = 14.51$; $p < 0.01$
	No (%) having a BMI of ≥ 25 kg/m ² (overweight) or ≥ 30 kg/m ² (obese)	64 (48.1%)	14 (17.7%)	$\chi^2 = 20.07$ $p < 0.01$
Sleep	No. (%) sleeping badly or very badly in general	29 (16.6%)	13 (15.5%)	$\chi^2 = 0.02$ $p = 0.89$
	No. (%) sleeping for fewer than seven hours per night on average	63 (36.0%)	22 (26.2%)	$\chi^2 = 2.48$ $p = 0.12$
Alcohol	No. (%) drinking alcohol at least weekly	58 (33.5%)	20 (23.8%)	$\chi^2 = 2.53$ $p = 0.11$
	No. (%) drinking alcohol occasionally or never	115 (66.5%)	64 (76.2%)	$\chi^2 = 2.53$ $p = 0.11$
	No. (%) who reported no binge drinking	5 (2.9%)	18 (26.9%)	$\chi^2 = 24.19$ $p < 0.01$
Smoking	No. (%) current smoker	38 (22.1%)	2 (2.4%)	$\chi^2 = 16.63$ $p < 0.01$
WEMWBS	WEMWBS mean score	49.2	49.9	
	No. (%) with WEMWBS score <46	60 (34.7%)	24 (29.6%)	$\chi^2 = 0.63$ $p = 0.43$

^aThere were slight variations in the numbers of students replying to individual questions.

at the Scottish HEI, representing 17.7% and 4.7% of each cohort, respectively. Students were recruited via a notice on their university learning platform and an email invitation. They were interviewed at a location of their choice: a campus office or a quiet coffee shop where only the participant and interviewer were present. Interviews were conducted using a topic guide that had open questions to guide the interviewer but also allowed exploration of emerging topics. They were carried out by members of the research team (DC, JE) and by a postgraduate research student. Interview length averaged 45 min, and interviews were audio-recorded and transcribed verbatim. Recruitment ceased at the point of saturation. Data were coded by two researchers (DC, FM) using NVivo software, and thematic analysis was undertaken by the same two researchers. A coding tree was identified and agreed upon by both researchers and themes were identified. The social cognitive theory (Bandura, 1977) was used to consider and organise these themes taking into consideration wider contextual influencing factors on health behaviours. This is the most widely used model in health and behaviour change. Supporting the analysis with this theory allowed an understanding of factors that impacted health behaviours within this group.

Ethical approval for the different elements of the study was granted by the University of Stirling School of Health Sciences Research Ethics Committee (15/16:67), the General University of Stirling Ethics Research Panel (GUEP 68, 181), the NHS Invasive and Clinical Research Committee (NICR16/17 CA007) and the Queensland Human Research Committee (2017000262).

Results

Questionnaires were distributed to 348 students and were completed by 259, giving an overall response rate of 74.4%. Among 235 students at the Scottish HEI, questionnaires were returned by 175 (74.4%) students. Thirty four (91.4%) were male and 128 (73.1%) were female. There were 11 non-binary and 2 specified no details. The mean age was 25 years (median 23 years). Around 97 students stated that either they or a sibling were the first person to go to university in their family. The 49 students (28.0%) who were also aged >24 years were classified as non-traditional students. Among 113 students at the Australian HEI, 84 (74.3%) returned the questionnaire. Ten (8.8%) were male and 74 (91.2%) were female, with a mean age of 21 years (median 19 years). There were 21 students who stated that either they or a sibling were the first person to go to university in their family, and 4 (4.8%) of them were also over the age of 24 years (and therefore classified as non-traditional students).

Table 2 presents the summarised results. There were some key differences and similarities between students at the two HEIs. In terms of mental health, similar proportions of students at each HEI rated their mental health as excellent or very good. Similarly, the WEMWBS score ranged from 14 to 70 among 173 students at the Scottish HEI, with a mean score of 49.2. Among 81 Australian students, the score ranged from 33 to 69, with a mean of 49.9. The proportions of students who scored less than 46 were 34.7% and 29.6%, respectively, but this difference was not statistically significant. Similarly, there were no statistically significant differences in the proportions of students at the two HEIs who reported sleeping badly or very badly or who had fewer than seven hours of sleep per night; but the proportions were fairly high.

During the 20 qualitative interviews, students from both HEIs reported that either they or their peers had experienced stress associated with their professional programmes, which impacted their mental health.

There's quite a lot of smokersand mental health, yes, one of my close friends actually had problems, she's had time off. And I think that was due to personal circumstances as well (S5)

I think over the three years I've definitely got a bit more emotional. (A11)

definitely it has had, at times had a very big impact on my mental health. (A8)

Students from both HEIs also noted the effect this had on their sleep.

I struggle with my sleep. I wake up many times and change positions ... it's shift work, em maybe lack of exercise as well. (S1)

However, there was a general consensus from the Australian students that PBL in small groups was an arena within which problems could be discussed.

Yes definitely, especially when it's a weekly thing or routinely so you always have that safety where if something did happen on shift you could always be like I know I can always talk about it on Thursday. (A10)

Physical health presented a more contrasting picture. Proportions of students who rated their physical health as excellent or very good were much lower among students at the Scottish HEI, and this was a statistically significant difference. Although there were similar proportions of students reporting that they achieved 150 min of physical activity each week, on exploring this issue qualitatively, the general impression was that the Australian students had a much more structured and regular approach to physical activity. They often referred to the number of sessions of specific physical activity per week, in contrast to the students at the Scottish HEI, who tended to describe their engagement in physical activity more sporadically. Only three Scottish students referred to a specific sport, whereas the majority of Australian students engaged in a sport several times per week. Although students from both HEIs referred to difficulties in scheduling physical activity, this was a more dominant theme among the students at the Scottish HEI. These students also noted that their HEI did not lend itself to nursing students participating in sports compared to students in other programmes:

They're doing lots of sports like within the week. Like when you might be doing classes or at placement.. So other friends like doing other courses they have more opportunities of physical activity. (S8)

During placement blocks they reported being '*too tired to go to the gym*' (S3) or unable to fit it in:

I used to go to exercise classes at The Peak. I was up until I started my placement. I just couldn't fit in. (S4)

Differences in proxy measures of diet (proportions of students rating their diet as very healthy or healthy, or having breakfast every day) were statistically significant and in the Australian students' favour. Although the differences in the proportions of eating five portions of fruit and vegetables per day (20.2% at the Australian HEI compared to 12.6%) or at least having weekly takeaways (35.7% compared with 43.1%) were also in their favour, the results were not statistically significant. Students at both HEIs referred to differences between healthy and unhealthy food, although it was notable that Australian students discussed the inclusion of substantial quantities of vegetables in their diet and demonstrated good levels of understanding of the required balance of different food nutrients and constituents: carbohydrates, protein, high fat and meat content. One student stated that most of her friends were vegetarian. In contrast, students at the Scottish HEI understood the importance of home-cooked food and '*making soup*' was mentioned several times, but the behaviours they referred to were often quite light touch, for example, taking a piece of fruit with them to work.

There was a general consensus among the students at the Scottish HEI that being on clinical placement was linked to poorer dietary habits; they were often less prepared and lacked the motivation to eat well.

Colleagues just grab anything they can eat. Some of them don't take a break. (S5)

Sometimes when I'm too tired after a 12 hour shift I just tend to eat a sandwich. (S1)

when I'm in practice it's it's my eating habits are worse. (S5)

This wasn't such a clear theme with the Australian students, with only one referring to eating fast food when rushed, although there were times when they too were under pressure.

when I am on prac a fair bit I tend to do more preparation regarding like making my own food healthily. But, and then around exam time and big assignments and stuff like that, because that was also a really stressful time. (A9)

The students at the Scottish HEI also referred to dietary provision at their HEI being poor; this was not mentioned by Australian students at all.

Healthy options for food at the Uni as well. The healthy options are so expensive compared to like the junk food, and they like you would think being a Uni ... the food and stuff would be quite cheap, that's definitely something that they should probably ... (S8)

If you go to the University's supermarket for example, there's the smallest bit is dedicated to fruit and vegetables. The other I mean the rest is all sausages, rolls, pre-packaged food, pre-packaged pre-packed eh sandwiches lot of sweet beverages. It's shocking. (S9)

In terms of BMI, Australian students were more likely to be underweight, and students at the Scottish HEI were more likely to be overweight or obese, probably reflecting different dietary and physical activity behaviours. These differences were also statistically significant.

Drinking behaviours in terms of weekly drinking or occasional drinking were similar. However, binge drinking was more common among Scottish students. This is reflected in quotes from Australian students who perceived drinking to be infrequent amongst their peers, while Scottish students mentioned drinking behaviours among their nursing colleagues.

Yeah it would just really be socially and not really when I'm at uni around about assessment times or prac. (A6)

I would say a lot of nurses go home and have a bottle of wine or a bottle of beer or. (S5)

Current smoking was also much more frequent among Scottish students, and this difference was statistically significant. It was noted that this was particularly the case among mental health students and was also linked to the behaviour of peers.

The one significant difference I've noticed is that more mental health nursing students smoke, compared to adult nursing students. (S1)

I think it's difficult especially when you're at Uni because it's a habit more than anything, it's it's sometimes I don't even need one but you know all my pals are going out for one so I'll go as well. (S2)

In contrast, in Australia: 'the student group none of them smoke' (A1) was attributed to knowledge of the harmful effects of smoking and again to peer influence:

It's because we are in health so that we know that smoking is so bad for you or just because of the like the peer groups if you are not around other people who are smoking then you also don't smoke. (A11)

Encouragingly, there was evidence that the nature of their course meant that some students actively tried to improve their health, and this was mainly expressed in relation to smoking. At the Scottish HEI, there was a perceived link between recognising the risks of smoking and clinical placements.

My last placement was on the respiratory ward and nurses that work in there go for their break and they're like "we're just going out for a cigarette" and I'm like – you work in a respiratory ward and you see it first hand! (S6)

its helped inform me of link the kind of potential risk factors of different health behaviours ... smoking's the main one that I've wanted to give up (S2)

Whereas, the Australian students seemed to view their peers as already demonstrating fairly good health behaviours.

In the student group none of them smoke ... I would say the majority wouldn't drink on a weekly basis, but occasionally they would. They definitely were not big drinkers ... I would say nurses are would be less drinkers than the other degrees ... I would say in general they are ok people. I can't, you know none of them are depressed or sad or anything like that (A10)

Discussion

The findings of this study have highlighted factors relating to the health behaviours of undergraduate nursing students at a Scottish and an Australian HEI, along with some similarities and differences. Some differences may be attributable to differences in socio-economic backgrounds of the students at intake. For example, a much higher proportion of students at the Scottish HEI have non-traditional backgrounds, in that many are over the age of 25 years and/or are the first person in their family to go to university. In contrast, the Australian HEI has an intake of many white, middle-class students from private schools, and there is a high academic entry requirement. However, while socio-economic status is associated with health and health behaviours (Petrovic et al., 2018), it is still possible that differences in course programme and structure may compound or mitigate the differences.

One similarity between the students is that they experience similar levels of perceived mental health, with around one-third scoring values on the WEMWBS that are indicative of being at high risk of major depression, or at high risk of psychological distress and increased risk of depression. This is similar to results from other HEIs in the UK and Australia (Australian Bureau of Statistics, 2012; Mitchell, 2018). The clinical care environment is a stressful area for students, and psychological stress is a major health concern to which student nurses are noted to be vulnerable. It is, therefore, important that such stress is appropriately assessed and that students have access to support, but it is noted that support service uptake within this group is limited (Mitchell, 2018; Zhu et al., 2020).

Social Cognitive Theory (Bandura, 1977) states that influences on health behaviours can be cognitive (knowledge, expectations and attitudes), environmental (social norms, access to community and influence of others) or behavioural (skills practice and self-efficacy). Some of the differences between these two groups of students can explain these factors. For example, binge drinking is commoner among Scottish students, and this is thought to be related to the background culture of the two countries (NHS Health Scotland, 2019b). Poor diet is recognised

to be prevalent in Scotland and is linked to high levels of overweight and obesity (Food Standards Scotland, 2015). The higher prevalence of smoking among Scottish students could be explained by their lower socio-economic status at intake, as smoking is one of the most socially patterned health behaviours (Australian Government, 2017; NHS Health Scotland, 2019a). International comparison of physical activity levels has demonstrated similar poor rates across Irish and Columbian students, but the high levels of alcohol consumption in Irish students were not noted in their Columbian counterparts for whom different family backgrounds significantly affected health behaviours (Burke & McCarthy, 2011; Rodriguez-Gasquez et al., 2017). At the same time, the high proportion of underweight students at the Australian HEI is unexplained. A New Zealand survey of student nurses identified confidence in health-related behaviours to be associated with age and life experience and called for issues such as shift work management and emotional preparedness to form part of the nursing curriculum (Walker, 2019).

Accordingly, despite background and cultural differences between the two student groups, there may also be characteristics of the HEIs themselves and the programme structure that influence behaviours; for example, PBL groups are a source of peer support in the Australian HEI. In Scotland, long blocks of theory and placement mean that students might find it difficult to learn and maintain healthy habits over a longer period of time. While they themselves state that they make less healthy choices when on placement, conversely, the longer blocks might make them more likely to observe the stark effects of poor lifestyle choices in practice when the effects are very visible. This was most clearly expressed among Scottish students for smoking and respiratory disease; although smoking was already uncommon among Australian students.

Although this study was limited to two institutions within each country, the same questionnaire was administered using the same protocol at the two HEIs to ensure that methods were comparable. Although some students may have responded incorrectly, perhaps due to social desirability bias, they were assured that their responses were anonymous, and this effect was likely to be similar in the two groups. The response rates were high. The qualitative element of this study was also carried out using standardised protocols and topic guides, and data coding and thematic analysis were carried out by two researchers independently.

Given the findings presented in this study, there is an identified need to strengthen nursing students' mental health while undertaking this challenging programme. Current accredited curricula do not provide innovative ways to address healthy lifestyles. Although professional bodies approve such curricula, it is the individual HEIs who develop and deliver curricula and have the potential to include such innovation. With this in mind, this study provides a platform to consider and test innovative and experiential learning interventions around health behaviours.

To conclude, perceived mental health among students at the two HEIs were similar. Students at the Australian HEI did identify that learning in small groups was supportive of their well-being, and this is a learning point for Scottish curricula as well as for HEIs internationally. In contrast, certain elements of physical health (perceived physical health, smoking, poor diet, overweight and obesity) appeared to be less favourable at the Scottish HEI. These differences may be mainly attributable to pre-existing background differences between the two undergraduate intakes. Given this, it is even more important that the HEI itself provides an environment where healthy behaviours are supported and encouraged. In Scotland, the opposite seems to be the case: it was only Scottish students who referred to characteristics of their HEI having a negative impact on their health behaviours. Given the potential role of these health promoters of the future alongside the impending chronic disease epidemic, nursing programmes need to embody public health by prioritising the needs of these unique learners and providing supportive environments that foster and encourage emotional support, as well as healthy lifestyles.

Implications for nursing and health policy

Nursing curricula are informed, guided and regulated by nursing education standards, and over recent years these standards have directed an increasing focus on the assurance that the public health role of the nurse is integrated into current nursing programmes (NMC, 2018). However, these standards or related policies do not link this with the health of those individuals performing these roles and how programmes can be enhanced to address the health and lifestyle behaviours of these up-and-coming health advisors of the future.

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Disclosure statement

No potential conflict of interest was reported by the author(s).

Data availability statement

The data that support the findings of this study are available on request from the corresponding author.

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