Original research

Strategies to promote nurses' health: A qualitative study with student nurses

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A B S T R A C T

Developing strategies to support student nurses' health is a global priority for healthcare organisations and governments. This is because emerging international evidence indicates that improvements in student nurses' health are required to increase the longevity of careers and reduce the loss of time, skill and financial cost of sickness absence and workforce exit. However, we do not know what intervention strategies student nurses think would support their health. The study aim was to explore student nurses' views on factors that influence health-related behaviours and strategies that could improve health. Data were collected through participatory activities during focus groups with student nurses in Scotland. Analysis was theoretically informed and involved mapping to the Behaviour Change Wheel framework. Students identified several factors that influenced health-related behaviours. Four were ranked most important: knowledge, culture, time constraints, and stress. Strategies student nurses thought should be prioritised to improve nurses' health-related behaviours were: stimulating a health-promoting environment by reviewing shift work, improving workplace support, increasing staffing levels, subsidising and role-modelling of healthy food and exercise; and creating applied health-promoting curricula by integrating time and stress management training and lifestyle advice into nursing education. Educational and environmental interventions are needed to support student nurses' health.

1. Introduction

Developing strategies to support the health of the nursing workforce is a global priority for healthcare organisations and governments (WHO, 2016; Scottish Government, 2017; House of Commons Health Committee, 2018; RCN, 2019; Wills et al., 2020). Prioritising the health of nurses is important for two reasons. First, it ensures effective health promotion. Student and registered nurses support health promotion through conversations with patients (DeCola et al., 2012), delivery of targeted behaviour change interventions, and role-modelling effects (Blake et al., 2011). However, the level to which patients and the public heed nurses' advice is influenced by nurses' own health-related behaviour and willingness to act as health promoters (Blake and Harrison, 2013; Mujika et al., 2017; Hurley et al., 2018). Second, it supports nurses' own health, increasing the longevity and satisfaction of their careers and reducing the time, skill and financial cost of sickness absence. Common reasons for sickness absence are musculoskeletal injury and stress (Moberly, 2018). Sickness absence and workforce exit due to ill-health increases healthcare expenditure through demand for temporary and agency nurses and the costs of nurses' own care through, for example, occupational health referral and treatment. In Scotland, recognition of the importance of the health of the nursing workforce is recognised through the Chief Nursing Officer's commitment to 'Promoting nurses' health and wellbeing' as part of the *Nursing 2030 Vision* (Scottish Government, 2017).

Increased attention on the promotion of the health of the nursing workforce has been prompted by emerging international evidence that indicates improvements in the health of student and registered nurses' health are required. Levels of overweight and obesity among nurses are higher than other healthcare professionals and the general working population (Kyle et al., 2016, Kyle et al., 2017a). Rates of smoking among registered nurses are known to be high (Perdikaris et al., 2010;

Schneider et al., 2019), and many engage in risky alcohol consumption (Buchvold et al., 2015; Raistrick et al., 2008; Schneider et al., 2019), fail to meet national dietary guidelines (Blake and Harrison, 2013; Malik et al., 2011; Priano et al., 2018; Ross et al., 2018; Schneider et al., 2019) and have low engagement in physical activity (Albert et al., 2014; Lobelo and de Quevedo, 2016; Schneider et al., 2019). Studies of student nurses' health have found that their health behaviours are sub-optimal on entry to undergraduate nursing programmes (Blake et al., 2011), and generally worse than those of qualified nurses (Malik et al., 2011). Smoking rates among student nurses are between 16% and 25% (Blake and Harrison, 2013; Blake et al., 2011; Evans et al., 2019). Alcohol consumption is high; up to 15% report binge drinking (Evans et al., 2019) with third year and male students known to consume significantly more alcohol than female and first year counterparts (Burke and McCarthy, 2011). Physical activity guidelines are not met by between 24% and 54% of student nurses (Evans et al., 2019; Blake and Harrison, 2013; Malik et al., 2011) and between 73% and 77% do not meet guidelines for consumption of fruit and vegetables (Blake and Harrison, 2013; Malik et al., 2011). Rates of overweight and obesity among student nurses are between 24% and 47% (Blake and Harrison, 2013; Evans et al., 2019).

The importance of student nurses' health in the UK is reflected by the Nursing and Midwifery Council (NMC) who state that nurses must "be able to manage their own personal health and wellbeing" and "make an important contribution to the promotion of health" (NMC, 2018 pg. 3). *The Future Nurse: Standards of proficiency for registered nurses* (NMC, 2018) are standards that highlight the role of the nurse in the 21st century and guide curricula content for all higher education institutions (HEIs) providing nursing programmes across the UK. These standards are grouped under seven platforms and the NMC advise that these platforms highlight the core knowledge and skills expected from every nurse at the point of registration (NMC, 2018). The seven platforms are:

1. Being an accountable professional
2. Promoting health and preventing ill health
3. Assessing needs and planning care
4. Providing and evaluating care
5. Leading and managing nursing care and working in teams
6. Improving safety and quality of care
7. Coordinating care.

Each platform is followed by a set of outcomes which reflect the proficiencies (knowledge, skills and behaviours) needed for nurses and midwives to practise in the UK. Students are assessed against these proficiencies to make sure they can provide safe and effective care.

Platform 1 'Being an accountable professional', states that students need to: "understand the professional responsibility to adopt a healthy lifestyle to maintain the level of personal fitness and wellbeing required to meet people's needs for mental and physical care" (NMC, 2018, p.8; 1.6). Platform 2 'Promoting health and preventing ill health' houses twelve proficiencies describing the underpinning skills and knowledge required to enable students' role in health promotion and protection and prevention of ill health (NMC, 2018, pg. 11–12). Platform 2 specifically addresses how student nurses must be able to "identify and use all appropriate opportunities, making reasonable adjustments when required, to discuss the impact of smoking, substance and alcohol use, sexual behaviours, diet and exercise on mental, physical and behavioural health and wellbeing" (NMC, 2018, pg.11, 2.4). Yet, as noted, research has shown that student nurse behaviours in relation to diet, substance use and exercise are sub-optimal (Blake et al., 2011) and consequently their ability to influence positive health outcomes in others potentially undermined (Blake and Harrison, 2013; Mujika et al., 2017; Hurley et al., 2018).

In light of the professional responsibility for students to maintain a healthy lifestyle and actively promote and support the health and wellbeing of people and mounting evidence demonstrating that student

nurses' health could be improved, there have been repeated calls for enhancement in health education and the development of interventions to support student nurses' health (Blake et al., 2011, 2013; 2016, 2017; Evans et al., 2019; Schneider et al., 2019). Research has shown that interventions should focus on specific barriers to healthy behaviours that confront nurses (Kelly and Wills, 2018). However, understanding causal factors underpinning poor health-related behaviour and development of strategies to promote healthy lifestyles is an important first step in intervention development. Student nurses are an important part of the current and future nursing workforce and, in the UK, spend equal portions of time in clinical placement and academic campuses. This means that student nurses are exposed to the healthcare environment and cultures that might shape their own and others' health-related behaviours, while simultaneously following programmes of education that are required to ensure that they better understand the factors that promote their own and others' health (NMC, 2018). However, merely addressing health as part of a programme of study may not be enough to address sub-optimal health behaviours. This study aimed to develop a more in-depth understanding about barriers to a healthy lifestyle, alongside exploring strategies that could support student nurses' to prioritise their own health. This qualitative study answered the following research questions:

1. What do student nurses perceive to be the underlying causes of nurses' health-related behaviours?
2. What strategies do student nurses think might improve nurses' health-related behaviours?

2. Methods

2.1. Study design

A qualitative study using focus groups was conducted with pre-registration student nurses in a Scottish university.

2.2. Participants

All nursing students in the second or third year of their three-year undergraduate programme at the university (n = 500) were invited to take part through information posted on students' virtual learning environment and in class. Students who wished to participate in the study were asked to contact the study researcher by email. No incentive was offered. We recruited second and third year students, rather than first year, because of their additional experience in clinical practice through placements, which makes them more aware of the challenges that registered nurses may face in terms of health behaviour.

2.3. Data collection

Data were collected during four 2-hour long focus groups in May 2015. Focus groups were facilitated by two researchers, audio-recorded and transcribed.

2.3.1. Focus group design

Focus groups encourage open discussions about sensitive issues since they allow for a setting in which participants do not feel personally questioned about their health behaviours, and they are useful to inform complex issues because of the "cascade effect" (Lindlof and Taylor, 2002) that occurs when other people's statements trigger ideas among participants. In our focus groups, we used participatory activities that drew on the views and experiences of participants, where the researcher's role was one of facilitating student nurses' collective creation of the research data. This participatory approach empowers participants as it gives a voice to participants who can "direct the discussion to topics important to them and to interpret the researchers' topics in their own way" (Skop, 2006, p. 117). The focus group activities were informed by

the principles of causal analysis. This is a participant-led approach to data collection and organisation (van Mierlo et al., 2010). In this study, causal analysis involved the creation of 'causal trees' to identify root causes of four health-related behaviours of interest: (1) smoking, (2) unhealthy diet, (3) alcohol consumption, and (4) lack of physical activity. Specific focus group activities (rounds) were initially piloted with academics at the university, primarily to test whether these activities could be completed within the time allocated. The final focus group design included three distinct parts: introduction, participatory activities, and evaluation (Fig. 1). After focus group one the research team met to consider whether the activities and approach enabled discussion to flow freely between student nurse participants to determine if changes to the focus group design were needed. However, the format was agreed to be appropriate to address the study research questions and no changes were required.

2.3.2. Participatory activities

Five rounds of activities were conducted in each focus group:

1. To open discussion on health-related behaviours, the facilitator presented results of a paper reporting prevalence of obesity among nurses (Kyle et al., 2016).

2. To derive underlying factors, pairs of participants wrote perceived causes on post-it notes which were collated to construct a group 'causal tree' for each health-related behaviour (Fig. 2).

3. To explore why students constructed their trees as they did, a group discussion was facilitated using probing questions that focused on the relationships between behaviour and causes, e.g.: "Why do you think poor dietary practices are the result of shift work?"

4. To prioritise perceived causes, each student was given three coloured stickers to mark the most important problem(s) across the four health-related behaviours, after which individual prioritisation was discussed as a group (Fig. 2).

5. To identify possible solutions and those stakeholders responsible for implementation, participants placed post-it notes with ideas to address the prioritised causes (Fig. 3).

2.4. Data analysis

Our data analysis was underpinned by a validated framework for the classification of behaviour change interventions – the Behaviour Change Wheel (BCW) (Michie et al., 2011). The BCW is an integrated framework of behaviour change theories, consisting of three distinct rings: (1) sources of behaviour; (2) intervention functions; and (3) policy categories. The COM-B behavioural system at the core of the BCW identifies Capability, Opportunity, and Motivation as interacting sources (causes)
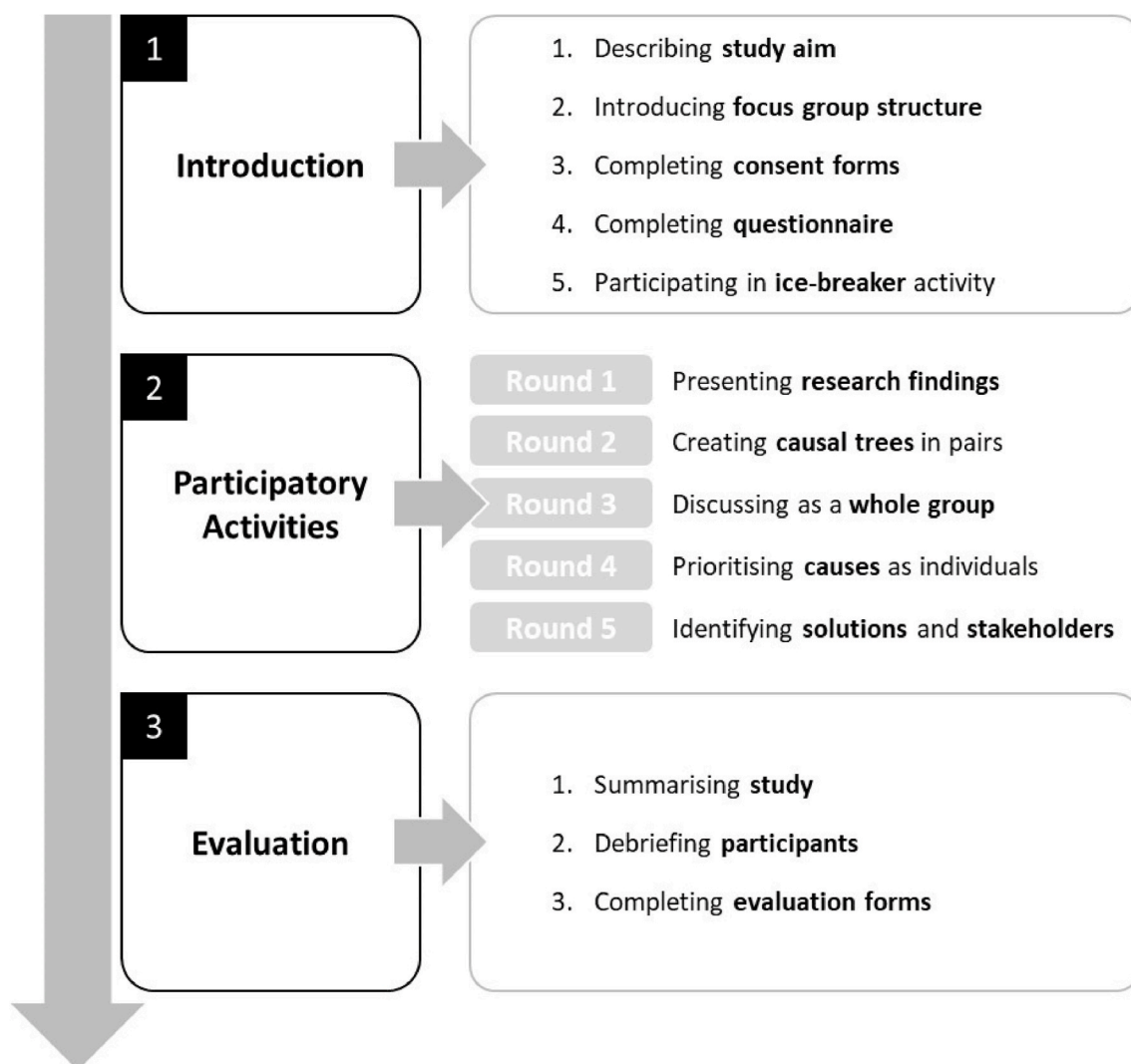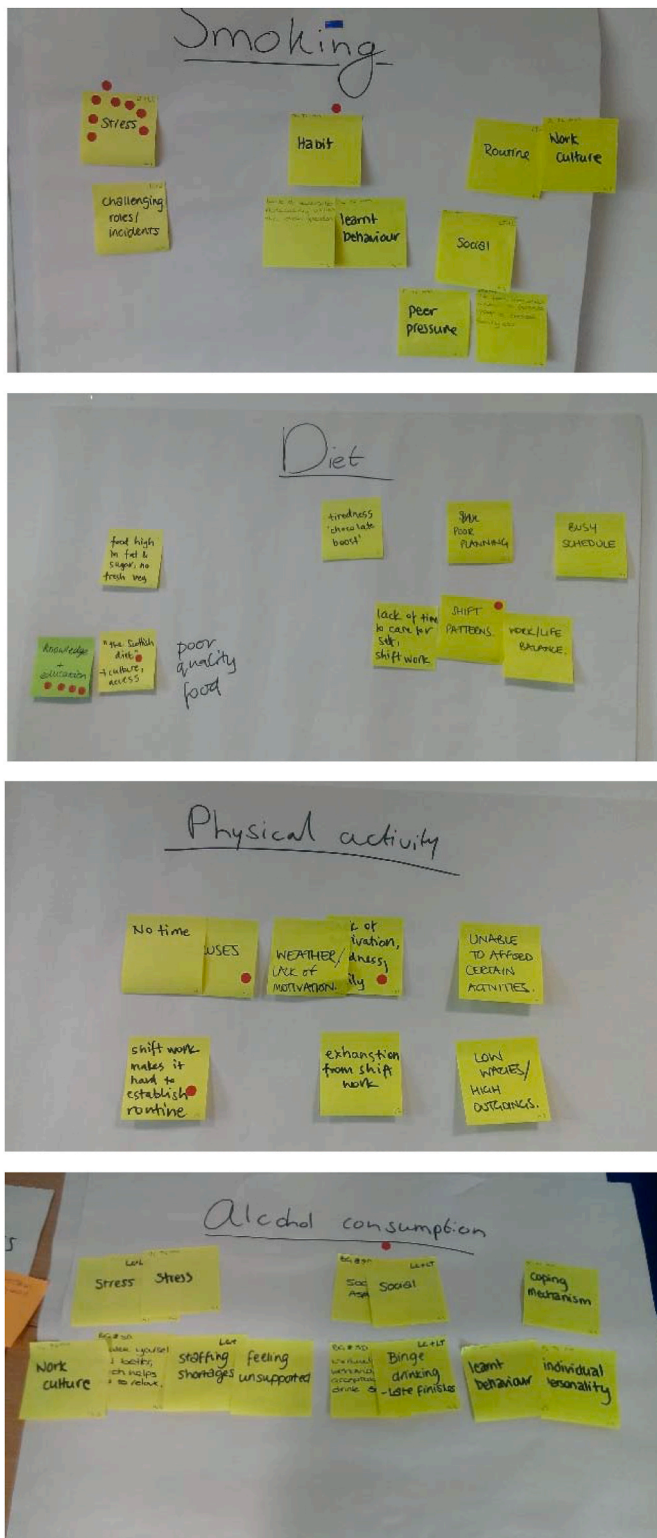

Fig. 1. Study flowchart.

Fig. 2. Examples of causal trees analysis from participatory activity rounds 2 and 4.

of Behaviour. Each source of behaviour is further categorised: Capability (psychological and physical); Opportunity (social and physical); Motivation (reflective and automatic). The COM-B model is often linked to the Theoretical Domains Framework (TDF) that comprises components from over thirty theories of behaviour change in 14 domains (Michie et al., 2005). TDF domains are mapped to COM-B sub-categories. This facilitates operationalisation of the concepts and can guide coding of

qualitative data, as used in this study (see Table S1 in Supplementary Online File for descriptions of TDF domains).

A two-stage coding approach was followed. First, codes were identified through inductive (open) coding. Second, open codes were mapped against the BCW as follows (see Tables S1 and S2, Supplementary Online File):

- To answer research question 1 (RQ1), open codes identified in data generated from focus group rounds 2–4 were mapped against the 14 TDF domains to enable integration with the COM-B model.
- To answer research question 2 (RQ2), open codes identified in data generated from focus group round 5 were mapped against the nine BCW intervention functions.

Consolidated criteria for Reporting Qualitative research (COREQ) (Tong et al., 2007) were followed to ensure transparency and rigour of study reporting.

2.5. Ethics

Ethical approval was granted by the research ethics committee in the University. Informed consent was obtained from study participants and data anonymised before analysis. Participants were given a numeric code (e.g., Participant 1 – Focus Group 1 = P1, FG1).

3. Results

3.1. Sample

Twenty student nurses participated in four focus groups (Table 1).

3.2. Underlying causes of unhealthy behaviour

Fig. 4 shows the 24 potential underlying causes (RQ1) of poor health-related behaviours the participants identified. All causes could be mapped to the COM-B model through the TDF domains (Table S1, Supplementary Online File). Students prioritised four key causes as most important: (1) knowledge (mapped to Capability); (2) culture (Opportunity); (3) shift work (Opportunity); (4) stress (Motivation) (see Fig. 4). Quotations illustrating each key cause are presented in Table 2.

(1) Knowledge

Lack of knowledge was an influential factor for smoking and poor diet, which was suggested to stem from the Scottish culture and a lack of practical education. Students believed many nurses and nursing students have difficulty estimating portion sizes and lack confidence and skill to prepare a healthy meal.

(2) Culture

Cultural aspects were discussed in every focus group, especially in relation to alcohol consumption and diet. Nursing students stated that within the nursing and medical professions there is an attitude towards alcohol in which drinking is part of socialising. Students felt that because nights out are rare due to irregular shift patterns, nurses have a reputation for binge drinking. Binge drinking was also seen as part of the Scottish culture, and participants stated that Scottish culture influences dietary practices.

(3) Shift work

In Scotland, nurses typically work a number of 12 or 12.5 h shifts. Shift patterns were mentioned as an underlying reason for poor health-related behaviour. Several student nurses had stopped eating breakfast because of the early starts, and after a long shift were often too tired to
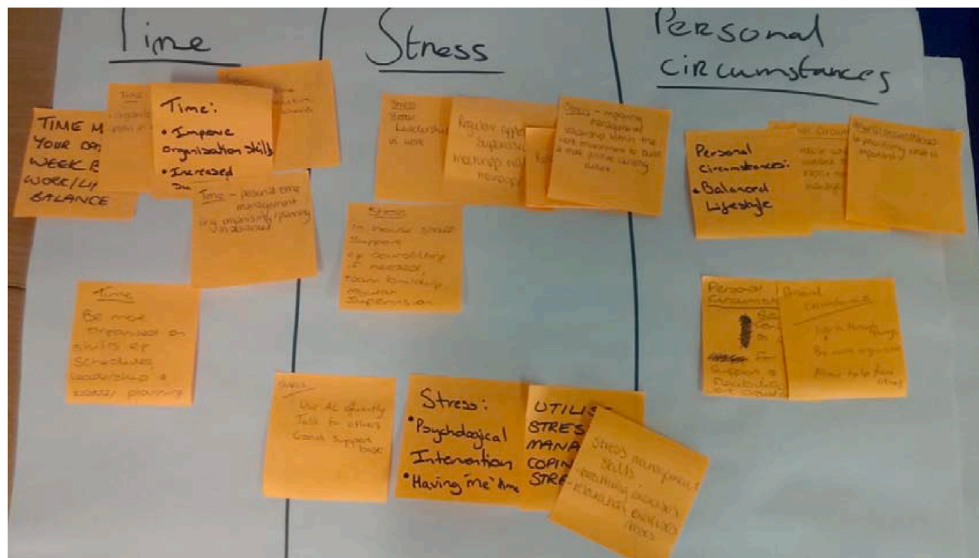
Fig. 3. Example of solution and stakeholder analysis from participatory activity round 5.

prepare food and instead opted for ready-made meals. Nurses' long working days were a reason for lacking energy to engage in physical activity.

According to the students, finishing a shift late in the evening can be a reason to drink alcohol, since pubs are open at that time. One student commented that in Scotland it is common for shift workers to have one or more alcoholic drinks in the morning after finishing a night shift. Working night shifts was thought to affect eating patterns, with student nurses stating they would bring many snacks on night shifts, because "it is quiet and you just eat" (P3, FG1). Moreover, the lack of healthy food options in hospitals during nights was viewed as problematic, and the irregularity of shifts made it difficult for nursing students to plan and regularly attend health-promoting activities such as services to help quit smoking, or exercise classes.

(4) Stress

Feelings of stress were regarded as an important reason for engaging in each of the four unhealthy behaviours. For instance, student nurses might choose comfort food over healthier options because "you're stressed and you're tired, you want fatty foods" (P3, FG4) or might resort to alcohol and cigarettes for stress relief.

3.3. Strategies to promote healthy behaviours

Students identified seven strategies (RQ2) to address the four key causes of unhealthy behaviours. Strategies identified by students mapped to 6 of the 9 BCW intervention functions (Table S2, Supplementary Online File). Most solutions identified mapped to the intervention categories of *environmental restructuring* and *education*. Students did not identify *persuasion*, *coercion* and *restrictions* as intervention functions that would promote healthy behaviours. Quotations illustrating each solution identified are presented in Table 2.

(1) Reviewing shift work

Students felt that shorter shifts, self-rostering, and more flexible shift patterns could promote healthy behaviour.

(2) Improving workplace support and leadership

Students directly linked the impact of stress on health-related behaviour with the quality of leadership that determined support

available. Students highlighted that asking for help in stressful situations can be difficult and depended on a nurse's relationship with their manager and practice (ward) culture. Enabling regular time for constructive reflection with supportive leaders before the end of each working day was considered by students to be a key way to alleviate stress and support a positive work culture.

In addition to allowing time for reflection, students felt that it is important to have protected break times. Students noted that nurses are often not able to take their breaks, which they felt causes elevated stress levels, and encourages consumption of unhealthy food from vending machines.

(3) Increasing staffing levels

Students believed that providing time for reflection and protected break times, as well as accommodating changes to shifts, would be enabled by increasing staffing levels.

(4) Subsidising healthy food and exercise

Subsidised healthy food available 24 h a day, gyms on hospital grounds and (free) group exercise classes were regarded as ways to promote positive health behaviours among employees and change workplace culture. Doing exercise with colleagues before starting a shift was also mentioned as something that might improve health and increase productivity.

(5) Promoting peer-to-peer activity and role-modelling

Peer-to-peer activities for nurses in practice, were also considered a potential intervention. In addition, role-modelling of healthy behaviours from peers was suggested by one student to improve health-related behaviours.

(6) Integrating lifestyle advice into nursing education

Students considered that dietary education should be part of pre-registration nurse education and continue after qualification. Although students agreed nurses should already be knowledgeable, they felt application of this knowledge was lacking. Providing practical courses on healthier cooking and organising meals for shift work were potentially valuable additions to curricula.

Table 1
Sample characteristics.

Variable	Response	n	%
Gender	Female	19	95
	Male	1	5
Year of study	Second	9	45
	Third	11	55
Field of nursing practice	Adult	4	20
	Mental health	4	20
	Learning disabilities	12	60
Health-related behaviours			
Physical activity			
Physically active on most days of the week for >30 min each time	Yes	13	65
	No	7	35
Smoking			
Current smoker	Yes	4	20
	No	15	75
	Other (e-cigarettes)	1	5
Diet			
Eat 5 servings of fruit/vegetables a day	Rarely	1	5
	Sometimes	13	65
	Everyday	6	30
Eat foods high in fat, salt and sugar	A few times a week	12	60
	Once a day	6	30
	2-3 times a day	2	10
Alcohol consumption[1,2]			
Frequency of consumption of standard drink containing alcohol	Never	0	0
	Monthly or less	6	30
	2-4 times a month	7	35
	2-3 times a week	6	30
	4 or more times a week	0	0
Number of standard drinks containing alcohol consumed on a typical drinking day	1–2	5	25
	3–4	5	25
	5–6	4	20
	7–9	3	15
	10 or more	1	10

Notes: [1] One participant did not complete the questions on alcohol consumption. [2] Questions were based on the alcohol consumption guidelines that were in place at the time, before the 2016 update.

(7) Providing time and stress management training

Students suggested training in time management and planning skills. Specifically, how to plan around their shifts should take place through workshops led by the university or employer. Moreover, students thought that behavioural support in the form of support groups or relaxation classes could be a powerful tool to manage stress.

4. Discussion

Student nurses in our study identified four key causes of unhealthy behaviour and seven strategies to address these underlying causes were proposed. Most intervention strategies focused on restructuring healthcare environments, including incentivising of individuals and groups, and on creating health-promoting curricula at pre- and post-registration level.

4.1. Restructuring healthcare environments

Experiences of student nurses during clinical placement show that interventions are needed that target nurses' physical and social workplace environment and associated stress. Previous research shows that nurses turn to alcohol, smoking or emotional eating of foods high in fat, sugar and salt (HFSS) to relieve stress (Phiri et al., 2014). Burnout is also known to be higher in hospitals that are poorly staffed (Aiken et al., 2010). When nurses feel supported by nurse managers and have higher levels of job satisfaction, the work environment is generally rated as healthier and nurses are more likely to engage in health-promoting self-care (Sherman and Pross, 2010; Ross et al., 2018). Similar to our findings, a systematic literature review by Nicholls et al. (2016) found that barriers to healthy eating for nurses mostly relate to the work environment and adverse work schedules. Furthermore, heavy workloads and staffing shortages often prevent nurses from taking their breaks, even on long shifts (Faugier et al., 2001b; Keogh, 2014a; Phiri et al., 2014).

To support nurses' health, it is vital that clinical environments are properly staffed. Yet, this is challenging in the face of global nursing shortages (Huston, 2013; WHO, 2019). It is therefore important to equip nurses to manage stress and to allow them to take appropriate breaks *during* a shift. Echoing the results from another qualitative study (Phiri et al., 2014), students suggested that clinical leaders should manage the stress of the clinical environment at source through, for example, clinical supervision or debrief sessions *after* a shift. A recent qualitative study among nurse leaders emphasised the importance of encouraging nurses' self-care to promote nurse resilience, along with strategies like fostering mindfulness practice (Wei et al., 2019). Nursing education is an ideal time to start encouraging this awareness of self-care and its relevance to the nursing profession Healy and Mc Sharry, 2011.

By itself, the nature of shift work negatively affects dietary intake and smoking behaviour (Zhao and Turner, 2008; Panczyk et al., 2018). Similar to findings from Keogh (2014a), participants in our study noted that during placements they had limited time and energy to engage in health-promoting behaviour after a long shift, and that the irregular nature of shift patterns disrupts the ability to live a healthy lifestyle, e.g. to regularly attend exercise classes. Nurses with rotating/irregular shift patterns have been found to have significantly lower health-promoting behaviour compared to those with straight day shifts (Najaf-Abadi and Rezaei, 2018). Enabling nurses to choose their own working patterns might help to improve health behaviour and contribute to staff morale.

4.1.1. Incentivising individuals and groups

Students noted the important role of incentivising individuals or groups to engage in health promoting activities, especially to encourage healthy food choices and exercise. Ease of access to HFSS foods such as sweets or cakes through social eating in clinical teams or patient gifts can have a negative influence on nurses' dietary behaviour (Persson and Mårtensson, 2006; Phiri et al., 2014). This is exacerbated by lack of availability of healthy options in hospitals and the limited opening times of canteens (Faugier et al., 2001a, 2001b; Persson and Mårtensson, 2006; Phiri et al., 2014), particularly during night shifts (Keogh, 2014b). Government policy in England (NHS Improvement, 2019) and Scotland (Scottish Government, 2017) is now focussed on increasing access to healthy food in hospitals (Kleebauer, 2014), providing healthier options in vending machines or offering packed lunches in catering facilities (Faugier et al., 2001a). Appropriate food labelling has been noted as key to enable nurses (and other healthcare professionals) to make informed food choices (Faugier et al., 2001a). Similar strategies could be applied to university environments in order to stimulate student nurses in making healthy choices.

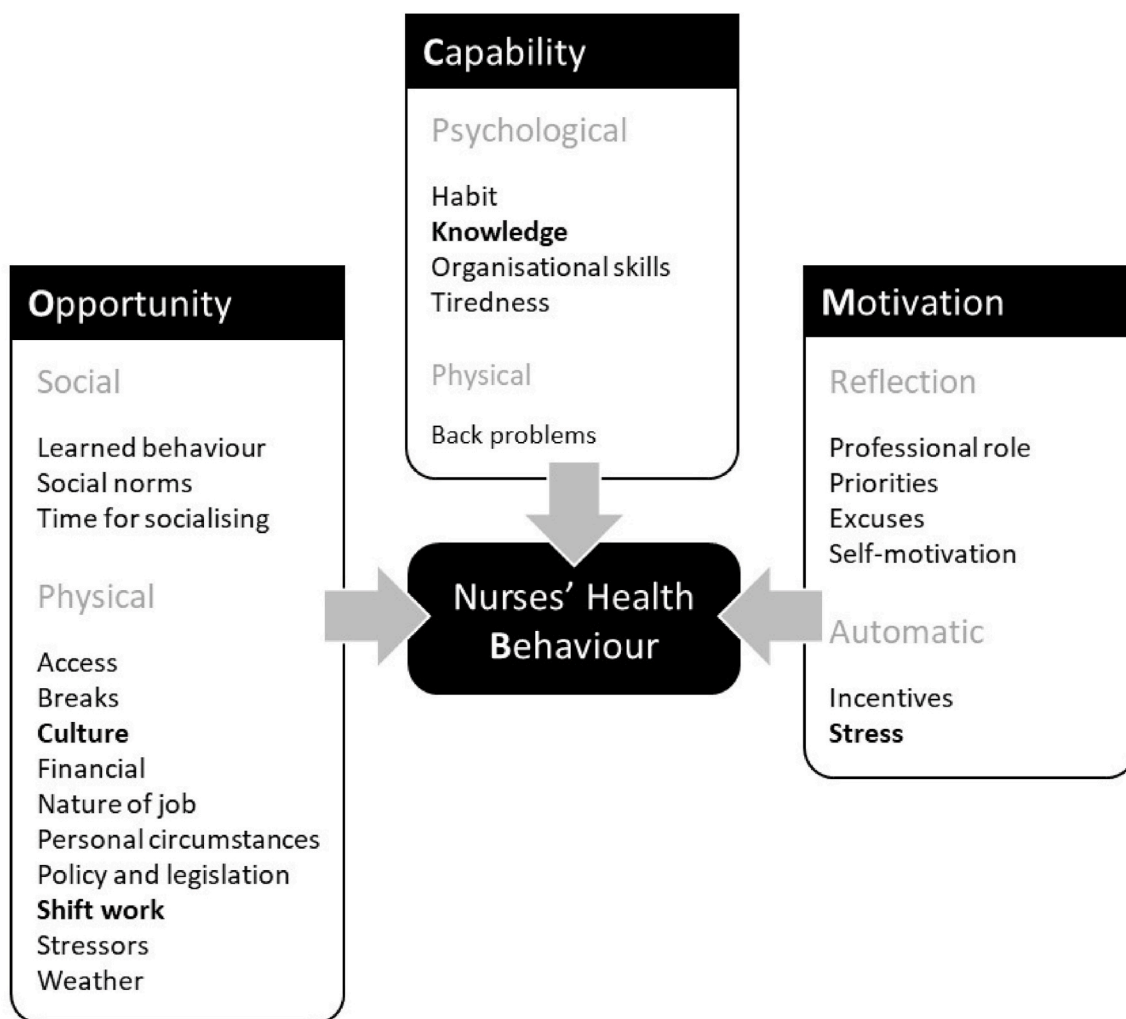Subsidising healthy food choices was noted by students in our study

Fig. 4. Causes of nurses' health behaviours mapped to COM-B Model.

as a complementary approach, as was peer-to-peer support and education. Students suggested appointing "healthy eating champions" who could educate other students or nursing colleagues about nutrition and food preparation. The role of a workplace 'Health Champion' is an established concept, referring to "individual employees who understand the importance of employee health and well-being, and who actively promote health behaviours within the organisation" (Blake and Chambers, 2011, p. 206). Recent studies suggest that the social environment in the workplace can be an effective motivation for lifestyle change and that nurse leaders and educators can function as advocates for change through their role modelling function (Torquati et al., 2016; Ross et al., 2017; Wills and Kelly, 2017). However, having workplace Health Champions is not yet common practice in NHS facilities or University campuses.

4.2. Creating applied health-promoting curricula

Participants in this study were clear that nursing curricula should be adapted to encourage healthy behaviour. The standards of proficiency for registered nurses (NMC, 2018) outline proficiencies in relation to the personal health and wellbeing of students (Platform 1), the requirement for them to become knowledgeable in order to influence positive health outcomes for others (Platform 2), and enabling people to become partners in decision-making about their own health (Platform 3 and 4).

Our study enabled student nurses to identify possible strategies that can be embedded into nursing curricula to help them work towards achieving professional proficiencies, improve their knowledge, and hence ability to influence positive behavioural change for themselves and others. For example, although nurses are generally aware of the importance of good nutrition for health (Park et al., 2011; Yfanti et al., 2011; Ilmonen et al., 2012), findings from our study and others highlight that they can be unsure *how* to eat healthily (Ilmonen et al., 2012; Faugier et al., 2001a) or make poor food choices as a reaction to long hours and stress (Almajwal, 2016). Despite nutrition education being part of most nursing curricula, nurses often feel that the education provided is not meaningfully applied (Ilmonen et al., 2012; Faugier et al., 2001a). As pre-registration education is the most important source of nutritional information for nurses (Lyon et al., 2006; Ilmonen et al., 2012), it is important that this training is effective in supporting good dietary practices even in the face of challenge. Incorporating diet and nutrition content, including the creation of a personal "health promotion plan", has been shown to improve students' dietary behaviour (Stark et al., 2012; McSharry and Timmins, 2016).

In addition to specific education around diet, students suggested that time management training at universities during pre-registration programmes or through post-registration continuing professional development, might help nurses to attain a good work-life balance and to organise their lives around shifts; e.g., how to prepare food in advance and how to fit in regular exercise in their schedules. Equipping nurses with good time management skills can decrease the risk of burnout (Fearon and Nicol, 2011), emphasising the importance of both restructuring working environments and supporting nurses to thrive within

Table 2
Illustrative quotations.

Theme	Illustrative quote
Causes	
Knowledge	"Not being familiar with food, and not being confident to cook and prepare food. Not having ideas about what kind of things you can eat. In terms of using vegetables. That people are kind of blank and go 'oh, pizza'. We're not used to knowledge going down all the time." (P1, FG2)
Culture	"Nurses are the party animals. I've yet to meet any nurse that's been on a night out and said 'I had a couple of drinks and I went home'." (P1, FG4)
	"In the Mediterranean you sit down and you're eating slowly. And you're eating because you know it does you good. Here people don't relate to having a good diet means generally your wellbeing is affected. There's no correlation with that in Scotland." (P4, FG2)
Shift work	"Doing long hours and then you're going to sleep, probably getting up early the next day to do another long shift. You just want to relax and you don't have time and energy to exercise." (P5, FG1)
	"Or because of the times the canteen's open. There isn't access. We can only go to a vending machine and buy chocolate and crisps." (P4, FG1)
	"It is difficult, if you sign up for a class, to keep going. Because your shifts are always changing. In first year I tried to do tai chi, in second year I tried to keep up a yoga class, and it just all went by the board. Because the shift patterns that we do, every week is different. You're never going to have one day that you know you can commit to class." (P1, FG2)
Stress	"Our underlying cause was stress. At the end of the week, for alcohol that might be the cause, you could have been stressed all week. Or for the whole week the morale in the work has not been good, so you have had tension with colleagues. So as soon as you finish, you're like 'I can finally relax and I don't need to go back until the next week'." (P4, FG2)
	"A cause would be stressful work. Your day in your job is maybe a reason why you want a cigarette." (P4, FG3)
Strategies	
Reviewing shift work	"We could change the shift patterns, because we didn't used to have 12.5 h shifts. We used to have morning and afternoon shifts. And it's been put to me that 'oh the nurses like long shifts because then they get four days off.' I think some people do, some people don't. I just suggested that maybe wards could choose what shift patterns they use, or staff could work half shifts, or this could be varied." (P4, FG2)
	"I have worked in places that do that [self-rostering], and that's really good. Because some people even prefer weekends for whatever reasons. So great, give them lots of weekends and then people who don't like it can have time off then. It's great when it works that way." (P5, FG3)
Improving workplace support	"If you've got a supportive leader, they will check on how you are feeling after your shift, or if something has happened. How you think it went and what you think was leading to it happening. More support would limit your stress. And in that way, you're not going home panicking about it." (P4, FG1)
Increasing staffing levels	"P1: To help reduce the stress. If you had more staff less buzzers would be going off, there would be less people shouting for you in particular, because there would be somebody else there. You wouldn't need to struggle to get people out of the unit. There could be the numbers there to get whoever out of the place and for people to still be functioning back there.
	P5: There would be less mistakes.
	P1: Yeah, and there would be more of a team sort of thing. I think every other reason under the sun." (FG3)
Subsidising healthy food and exercise	"Subsidised healthy eating. So say a plate of chips is a pound, and if you have a plate of salad it's only 50p. So additional incentives to eat healthily and exercise." (P4, FG2)
	"Free classes, gym, free bike to work schemes, other incentives, group classes." (P1, FG2)
Promoting peer-to-peer activity and role-modelling	"Time to share information, motivation, with colleagues. […] What your colleagues do really has an impact on it." (P1, FG2)
	"Each hospital should have like, and this is going to sound super cheesy, but like healthy eating champions, and they go and help people in the workplace. They go to everybody's staff room, or they have little groups, like running groups where people can opt to go if they want." (P3, FG2)
Integrating lifestyle advice	"Offer courses, teach them cooking skills, teach them ways of breaking the habits that they're in, of bringing unhealthy stuff" (P3, FG2).
Providing time and stress management training	"They need to be organised and pre-planned around their shifts. That goes back to educating, though. Thinking: what are the shifts you're working, what are the meals that you're going to need, how can you fit in some exercise around that?" (P4, FG2)
	"P3: And maybe psychological intervention like support groups.
	P7: I said the same: stress management skills, breathing exercises, relaxation classes." (FG1)

them. Our study suggests that this might be especially effective if food preparation skills and prioritising healthy diet alongside shift work are also part of education.

4.2.1. Responding to culture, stress and shift work in nurse education

The student nurses in our study pointed out that *nurses have a reputation for binge drinking* – (i.e., it is characteristic of the culture) and associated it with *infrequent opportunity to socialise and irregular shift patterns*. When discussing food choices, they referred to *comfort eating in response to tiredness* and reaching for *fatty foods* or *resorting to alcohol and cigarettes for stress relief*. The consumption of hyperpalatable foods and drinks, such as high fat and sugar, are recognised reactions to stress, that individuals can struggle to control and over time are linked to neurobiological adaptations that promote increasingly compulsive behaviour (Yau and Potenza, 2013). This may go some way to explaining repeated poor health choices resulting in poor health status within the nursing workforce. The NMC, 2018 acknowledge that being resilient and emotionally intelligent are key proficiencies of the registered nurse. However, this does not mean that the experience and behavioural outcomes of uncontrollable stress are acceptable. Yet, as

part of the current reality for nurses it should be meaningfully addressed within any programme of nurse education designed to prepare students for practice.

Nursing curricula are often content laden (Baron, 2017) which means that topics such as acknowledging work-related stressors and their impact on self are frequently not prioritised. The impact of poor diet, excessive alcohol consumption and smoking may be incorporated into curricula in relation to nurses' role in supporting improvements in population health as required by the NMC, 2018, but the long-term effect of these risk-taking behaviours are seldom associated with the poor health of the nursing workforce. There may be a reluctance in nursing education programmes to honestly acknowledge the impact that working within health and social care environments has on employee health, disclosed through a tendency to vilify workers as being hypocritical health promoters (Blake and Harrison, 2013) without acknowledging that the adoption of unhealthy choices can be a physiological reaction to stress (Yau and Potenza, 2013).

Being honest – the duty of candour – is, however, one of many key nursing requirements, as is the duty of care (NMC, 2018b). Therefore, nurse education has a duty of care towards nursing students in ensuring

they are adequately prepared for registration by being honest about the realities they will encounter and equipping them to counteract and challenge workplace cultures that are not conducive to their own health. Not addressing the impact of current working environments on health within nursing curricula may, indeed, be dishonest, and perhaps signals that students and educators need to work more collaboratively to understand and address the potentially harmful realities of practice. This study demonstrates the potential value of this collaboration to influence future nursing education by setting out one potential participatory approach to develop applied health-promoting curricula.

Participatory approaches are considered the cornerstone of co-creative models of curriculum design in higher education, where students actively participate and collaborate in curriculum development (Dollinger and Lodge, 2019). Nurse educators, specifically, have been encouraged to ensure that the considerable knowledge and expertise that students accrue during their training contributes to curriculum development (Dyson, 2018; Macaden et al., 2017). For example, co-creative principles and philosophies have previously been used to successfully enhance key aspects of nursing curricula, nursing care and service provision, including; the promotion of person-centred care (Tee and Üzar Özçetin, 2016), dignity in care (Kyle et al., 2017b; Munoz et al., 2017), and healthy lifestyles (Ward and Carter, 2020).

Although the primary outcome of our study is an understanding of students' views on the underlying causes of nurses' health-related behaviours and the strategies that might improve these, it also shows how collaboration between students, their educators and researchers can be enabled to move from understanding towards influencing change in education and practice. In this way, it serves as an exemplar of co-productive practice (NMC, 2018), setting out an approach through which students can be given the opportunity to work in partnership to identify strategies for optimising their own health and embed these in their curricula. Given the international imperative to improve nurses' health (WHO, 2016), we suggest that the participatory approach adopted in our study should be used by educators elsewhere to become a foundation for development of applied health-promoting nursing curricula.

4.3. Study strengths and limitations

This is the first study to use a participatory approach to gauge student nurses' views on the underlying reasons for challenges (associated with nursing practice) in adopting health-related behaviours. A strength of the study is the rigour from the use of a validated data collection method and theoretically informed analysis strategy. Piloting this method prior to use, combining individual and group exercises to mitigate the influence of social desirability bias and groupthink, gathering data through both written exercises and audio transcripts, and conducting four separate focus groups further strengthened the rigour of the study.

However, our study has four main limitations. First, our sample size was relatively small (n = 20) and may not reflect all the nursing students on the programme at the University. Data were gathered and presented on the health-related behaviours of participants. However, no data are available from the whole cohort at the institution to assess representativeness of the sample. Second, the study sample only included student nurses at one Scottish University and three out of four participants were specialising in learning disabilities or mental health nursing. Third, because the study was focussed on health-related behaviours this could have been perceived by students as a sensitive topic, hampering participation. Fourth, our analysis is based on perceptions of student nurses rather than those of registered nurses. Comparative studies across institutions in the UK and internationally using the same approach and involving both student nurses and registered nurses across all fields of practice are warranted to increase knowledge and influence action in this area.

5. Conclusion

Student nurses in our study proposed health-promoting curricula, restructuring of healthcare environments, and incentivisation of individuals and groups as key intervention strategies to promote health among themselves and their nursing colleagues. Changes to the organisation of shifts, including self-rostering and protected break times, subsidised healthy food choices and exercise facilities, and education on nutrition, food preparation and time management were considered important ways to avoid and relieve stress and support health. Educational and environmental interventions are needed to enable student nurses to maintain and improve their health-related behaviours and to decrease and manage stress. This will help to support overall improvements in student nurses' health and to promote a future workforce that is able to respond to the challenging healthcare and prevention needs of patients and the general population.

Ethical approval

Ethical approval was granted by the research ethics committee at Edinburgh Napier University.

CRediT authorship contribution statement

Marieke A.R. Bak: Conceptualization, Methodology, Investigation, Formal analysis, Data curation, Project administration. **Louise P. Hoyle:** Methodology, Validation, Formal analysis, Visualization. **Catherine Mahoney:** Methodology, Validation, Formal analysis, Visualization. **Richard G. Kyle:** Conceptualization, Methodology, Validation, Formal analysis, Visualization, Resources, Supervision.

Declaration of competing interest

The authors declare that they have no conflict of interest.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nepr.2020.102860.

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