HEALTHY LIFESTYLE BEHAVIOURS PREDICT HEALTH PROMOTION ATTITUDES IN PRE-REGISTERED NURSES: A QUESTIONNAIRE STUDY

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Abstract

Background: Nurses report inadequacies in health promotion practices and recognise their own lifestyle choices influence their willingness to give health promotion advice. The aim of this study was to investigate attitudes towards being role models for healthy eating, and examine predictors of health promotion attitudes in pre-registered nurses as health professionals of the future.

Method: Questionnaire survey with 493 pre-registered nurses. Measures included health promotion attitudes, healthy lifestyle index (combining diet and physical activity habits), self-esteem and body satisfaction.

Results: Pre-registered nurses (89.5%) felt that nurses should be role models for health; at the same time 37% had rather negative health promotion attitude. Those who disagreed were more likely to be dissatisfied with their body and lead less healthy lifestyles. Most pre-registered nurses (96%) felt that delivering health promotion would be a key element of their job and held positive health promotion attitudes. Healthy lifestyle was the most consistent significant predictor of health promotion attitude.

Conclusion: Pre-registered nurses with unhealthy lifestyle, lower self-esteem (and body dissatisfaction among overweight/obese student nurses) held more negative health promotion attitude. Intervention is needed to support pre-registered nurses in making healthy lifestyle choices, improving self-perception and health promotion attitude.

Key words: Health promotion, healthy lifestyle, nurses, obesity, self-perception.

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Excess weight and obesity are a major population health issue in the United Kingdom (NOF, 2014) and worldwide (James, 2004), with devastating effects for individual health, healthcare services and the economy. As the advocates for health, nurses play an important role in health promotion and the reduction of population obesity (Prime Minister's Commission, 2010). As such, patients view nurses as role models for health (Blake, 2013). Nurses generally agree with this view, and recognise that their lifestyle choices can influence those of their patients (e.g., poor diet and smoking: Blake & Harrison, 2013). However, nurses often do not lead healthy lifestyles themselves (McElligott, Siemers, Thomas, & Kohn, 2009), which can negatively impact on care quality (Hebert, Caughy, & Shuval, 2012; Lobelo, Duperly, & Frank, 2009) and their credibility (Blake & Harrison, 2013), as healthcare professionals who lead healthy lifestyle are more likely to deliver health promotion to patients than those who do not (Hebert et al., 2012, Lobelo et al., 2009). Nurses have reported previously that being overweight or engaging in unhealthy behaviours would reduce their willingness to promote health promotion to their patients (Blake & Patterson, 2015).

Even though nurses largely agree that it is important for them to make healthy lifestyle choices, this view does not necessarily translate into a healthier nursing workforce. In the UK, the Department of Health (DH, 2009) reported that 58% of nurses working for the National Health Service (NHS) were overweight; with 25% being obese. This is close to the amount of people with BMI > 25 in the general UK population – 61.7% (PHE, 2015), which is concerning taking into account the health-related education and training that nurses receive. Still, overweight and obesity remain prevalent amongst pre-registered (student) and registered (qualified) nurses (e.g., DoH, 2009; Blake, Mo, Lee, & Batt, 2012). Dietary habits are less than exemplar among nurses (especially among pre-registered nurses), as many of

them do not achieve healthy eating recommendations set by NHS (Malik, Blake, & Batt, 2011). This occurrence is attributed to working or having placements in a shift-type occupation, in an environment providing unhealthy food options (Phiri, Draper, Lambert, & Kolbe-Alexander, 2014). Whilst a proportion of nurses perceive that being a healthy role model to patients is unimportant and would not impact on patients, the evidence suggests that this may be the minority view, more likely to be expressed by those who have an unhealthy weight and engage in negative lifestyle behaviours (Blake & Harrison, 2013, Blake & Patterson, 2015). The Prime Minister's Commission (2010) stated that nurses should take responsibility for their own health, although continued efforts need to be made to support nurses in making healthier lifestyle choices, and raise awareness amongst healthcare professionals about healthy lifestyles and the potential influence of their choices on care quality. This applies equally to pre-registered nurses as the next generation of healthcare professionals.

Research suggests that self-esteem and self-perception may play a key role both in the adoption of personal health behaviours and in nursing practice, as individuals with higher self-esteem generally have greater self-confidence, are more assertive, and hold more positive attitudes towards healthy eating and exercise (Spurgas, 2005). Self-esteem in nurses may be important for their professional role, as greater self-esteem relates to professional nursing values, and the successful delivery of patient care (Lacobucci, Daly, Linedell, & Griffin, 2013; Randle, 2003). An early meta-analysis showed that self-esteem was lower in individuals with higher BMI than in those with a healthy weight (Miller & Downey, 1999).

Currently, however we have limited understanding of the relationship between self-perception in nurses, their BMI and healthy lifestyle behaviours (related to diet and physical activity habits) and their health promotion attitudes. As pre-registered nurses are the future NHS workforce, a better understanding of these issues within this population would allow for

a timely introduction of changes to nurse education that would promote healthy lifestyles, build self-esteem and impact positively on health promotion attitudes for the future.

The aims of the study were: [1] to investigate pre-registered nurses' opinions of being role models for healthy eating and their attitudes, and confidence towards giving health promotion advice; [2] to investigate the relationship between BMI, self-esteem, self-perception, healthy lifestyle and attitudes towards health promotion.

Methods

Ethical approval was granted by the local institutional review board in March 2014. A paper questionnaire survey was distributed between May - July 2014 to all pre-registered nurses within a single institution (n=868). The completion of the study was voluntary and anonymous. Informed consent was assumed from return of the questionnaire.

Measures

Five constructs were measured in this study: (a) demographics, (b), self-reported healthy lifestyle index combining diet and physical activity habits, (c) health promotion attitude (including Likert scale and three binary questions), (d) self-esteem, and (e) body satisfaction.

Demographic information was collected to determine representativeness of the sample: gender, year of birth, branch of nursing, year of study, degree specification and self-reported height and weight measurements, from which Body Mass Index (BMI) was determined using the formula kg/m^2 (WHO, 2014).

Healthy lifestyle was reported by each participant through their responses to questions created by the authors, starting with how healthy they considered their own diet to be. Pre-registered nurses scored this item on a scale of 1–10, from 'not at all' to 'extremely healthy'.

Participants also reported how many portions of fruit and/or vegetables they consumed in a typical day (from 0 to > 5). In the UK, the government recommends consumption of five portions of fruits and/or vegetables per day ('5-a-day'). For the purpose of this study, a higher amount of fruits and vegetables in one's diet was considered to indicate a healthier lifestyle. Lastly, participants were asked about their level of physical activity: "Think about all the physical activity you do in a typical week. Do you get a total of two hours and 30 minutes of moderate aerobic activity (e.g., brisk walking) every week? We coded as "0" participants who did not meet the physical activity (PA) recommendations of the UK Department of Health at the time of the study (i.e., at least 30 min of moderate physical activity for five days per week: DoH, 2011), and as "1", those who did. The rationale being that meeting these daily requirements is deemed to be beneficial, and not meeting them may be detrimental to health. All of the three variables above were collapsed together in order to create a 'healthy lifestyle index'. For the purpose of this study, it was considered that the higher the score on this index, the healthier was the reported lifestyle. Whilst a healthy lifestyle includes a diverse range of behaviours, to meet our study aims we focused only on reported diet and physical activity. In this context, the term healthy lifestyle acted simply as a descriptor of attainment of UK recommendations for diet and physical activity.

Participants were asked to complete a series of 14 statements, to establish their views regarding nurses as role models for health, and their attitudes towards health promotion; consistent with study aims, these had a specific focus on weight management, obesity and physical activity habits. Items and scale characteristics are described in Table 1.

==========insert Table 1==========

Participants completed the Rosenberg Self-Esteem Scale (Rosenberg, 1965), which is the most widely used (Marsh, Scalas, & Nagengast, 2010) and validated (Sinclair, Blais,

Gansler, Sandberg, Bistis, & LoCicero, 2010) measure of self-esteem. The scale is comprised of ten statements, where individuals indicate their agreement/disagreement on a four-point Likert scale. Total scores range from 0-30; the higher the participant's score, the higher their self-esteem. Those with a score below 15 were considered to have low self-esteem. The scale has high test-retest reliability and low social desirability (e.g., McMullen & Resnick, 2013). The level of reliability of this scale was satisfactory, with Cronbach's α=.86.

Self-perception was measured using the Stunkard Body Image Scale (Stunkard, Sorensen, & Schilsinger, 1983) - a commonly used measure of body satisfaction consisting of nine (male and female) schematic figures ranging from underweight to overweight. Participants were asked to select the figure that most closely represents their actual body size, and one that mostly represents the size they would like to be. The discrepancy between the perceived and ideal size is the measure of body dissatisfaction. The scale has established validity and test-retest reliability (e.g., Lynch, Liu, Wei, Spring, Kiefe, & Greenland, 2008).

Data were analysed using IBM SPSS statistics Version 22.0. All data were manually inputted, and a 10% data check was conducted. Analyses include descriptive statistics, Chi-Square tests, Pearson's product-moment correlations, independent groups t-tests, one-way ANOVAs, linear and binary regression models. The significance of the results was determined at the level of $p < .05$ (Fisher, 1956).

Results

This section provides information regarding sample demographics (Table 2), together with results demonstrating variables affecting pre-registered nurses' attitude toward health promotion (Tables 3, 4 and 5). Of the 868 pre-registered nurses invited to participate, 535 responded (67%), but 42 (8%) did not provide height and weight and were not included in analysis. The final sample was 493 (57%).

Sample Characteristics

Respondents were 493 pre-registered nurses (62% response rate; 90% female) from all four years of a degree programme. A high female to male ratio is typical for this career setting. The mean age of the sample (*M=25.36; SD=6.42*; range 20 - 56) reflected a typical pre-registered nursing population. Twenty-eight per cent of the sample was classified as overweight or obese according to the BMI category (n=139, 28%). As the sample of underweight pre-registered nurses was small (n=27, 6%), and there is evidence that people tend to underestimate their weight and overestimate their height (Engstrom, Paterson, Doherty, Trabulsi, & Speer, 2003), underweight and healthy weight participants were grouped together for analyses (n=354, 72%). Overweight and obese participants were significantly older than participants classified as having healthy weight/underweight [$t(176.15) = -5.38, p < .001$], and included smaller percentage of females ($\boldsymbol{X}^2 = 4.77, p = .03$), but there were no differences in the year of study distribution ($\boldsymbol{X}^2 = .73, p = .87$) or the nursing branch distribution ($\boldsymbol{X}^2 = 4.78, p = .092$). Age and gender were controlled for in the analyses of group differences (see Table 2).

Almost one third (32%, n=160) of the pre-registered nurses did not meet the government guidelines for physical activity (i.e., a minimum of 30 minutes of moderate physical activity on at least five days per week: DoH, 2011), and these were mostly the overweight/obese nurses ($\boldsymbol{X}^2 = 7.16, p = .007$).

Only 17% (n=90) of the full sample consumed the recommended five pieces of fruits or vegetables per day. Despite this, 43% (n=230) of student nurses viewed their diet as rather healthy (equal or higher than seven on the 10-point healthy diet scale). Pre-registered nurses with healthy weight/underweight were more likely to perceive their diet ($F(1, 490) = 5.67, p=.018$), as well as their lifestyle ($F(1, 487) = 3.93, p = .048$) to be healthy than the

overweight/obese students. Body dissatisfaction was prevalent with 78% (n=414) of the pre-registered nurses expressing dissatisfaction. The overweight/obese participants expressed higher level of body dissatisfaction, than those with healthy BMI or underweight [*F(1, 486) = 87.67, p < .001*]. Of the pre-registered nurses, 18% (n=95) were classified as having low self-esteem (*M=16.23, SD=2.50*), although there were no differences in self-esteem based on BMI classification (*F(1, 479) = 3.02, p = .083*). There was, however a significant difference in health promotion attitude (*F(1, 476) = 4.30, p = .04*) depending on BMI classification.

==========insert Table 2==========

On average the attitudes towards health promotion (HPA) of pre-registered nurses were more likely to be negative or neutral rather than positive (*M=2.22, SD=.52*; range 1 – 4; where 1 = strongly negative, and 4 = strongly positive), as over one-third (n=175, 37%) of the pre-registered nurses scored ≤ 2, where 2 represented a rather negative attitude. Only 13% (n=35) scored ≥ 3, demonstrating positive attitude, whereas the remainder (50%, n=269) scored in between, demonstrating a rather neutral attitude.

Relationships Between Variables

Attitude toward health promotion (HPA) among pre-registered nurses was correlated positively and significantly with healthy lifestyle (*r = .23, p < .01*), and self-esteem (*r = .20, p < .01*). This suggests that pre-registered nurses with a healthier lifestyle and those with higher self-esteem are more likely to hold positive attitudes towards health promotion. In the full sample, there was a trend toward a significant relationship between HPA and BMI (*r = -.09, p = .052).* Similarly, there was a significant relationship between HPA and body dissatisfaction (*r = -.11, p = .02).* These partial correlations (controlling for age and gender) are shown in Table 3.

==========insert Table 3==========

Multivariate Regressions

Age, gender, BMI, healthy lifestyle, body dissatisfaction, self-esteem and year of study were entered into a multiple linear regression model predicting the HPA of pre-registered nurses (see Table 4, left panel). The overall model was significant [$F(7,453) = 6.97$, $p < .001$], and explained 10% of the variance in HPA. The only significant predictors were self-esteem ($\beta = .19$, $p < .001$) and healthy lifestyle ($\beta = .21$, $p < .001$). The same analysis (see Table 4, right panel) was undertaken with only the overweight/obese subsample (n=127). Here, the overall model was significant [$F(7,119) = 4.11$, $p < .001$], and explained 20% of the variance in HPA. The significant predictors in the model were once again self-esteem ($\beta = .17$, $p = .04$), and healthy lifestyle ($\beta = .32$, $p = .001$), with an additional influence of body dissatisfaction ($\beta = -.25$, $p = .009$).

==========insert Table 4==========

Lastly, we analysed pre-registered nurses responses to three 'Yes/No' statements regarding their HPA (separate to HPA scale). Where possible (given adequate sample sizes) the binary logistic regression models were conducted, if else, percentage comparison and qualitative results are reported.

Feeling competent in giving health advice. There were 113 (23%) pre-registered nurses who reported that they would not feel competent giving health advice. These students were predominantly from year 1 (30%), 2 (40%) and 3 (27%), with fewer not feeling competent in year 4 (3%). The year of study, age, gender, BMI, self-esteem, body dissatisfaction, and healthy lifestyle were entered into a regression model predicting participant's response to the statement – "I would feel competent in giving health advice".

For the pre-registered nurses, the 'year of study' may be an important factor with regards their feelings of competence, given that placement exposure is limited in year one and increases throughout the training. The overall model was significant ($\boldsymbol{X}^2 = 15.95$, $p < .03$), explained 5% of the variance (Nagelkerke $R^2 = .051$) and correctly classified 76.1% responses. The only significant predictor for the feelings of competence was healthy lifestyle ($B = -.12$, $p = .003$; $Wald = 8.80$; $odds = .89$) (see Table 5). Results showed an additional potential impact of the year of study on feeling competent; as expected, pre-registered nurses felt more competent the further they progressed in their course ($B = -.23$, $p = .10$; $Wald = 2.69$; $odds = .79$). These results were corroborated by open-ended responses provided, since feelings of 'struggling oneself with a healthy diet', 'not doing it myself' and 'following a healthy lifestyle myself' were re-occurring themes for pre-registered nurses sharing perceptions of their own incompetence/competence in giving health promotion advice to others.

==========insert Table 5==========

Delivering healthy eating advice as a nurse. Only 4% (n=20) of the pre-registered nurses thought that healthy eating promotion would not be part of their job role. The open-ended responses indicated these participants held a belief that health promotion was solely the role of another healthcare professional (i.e., dietician).

Perceptions towards being role models for health. Only ten per cent (n=51) of participants stated that pre-registered nurses should *not* be role models for health. The analysis of the open-ended responses indicated that the majority of participants held a belief that nurses would *not* be good health models if they lead an unhealthy lifestyle, for example, if they smoke, eat unhealthily, do not exercise, or are overweight. Some pre-registered nurses

indicated that a lack of adequate knowledge about health behaviours might be a barrier towards them being a health role model.

Discussion

This study investigated pre-registered nurses' opinions of being role models for healthy eating and their attitudes, and confidence towards giving health promotion advice. Predictors of health promotion attitudes were examined.

As part of their training, the pre-registered nurses in this study had all been educated on the UK government guidance for healthy eating (consuming a minimum of 5 pieces of fruit and/or vegetables per day), and physical activity (undertaking at least 30 minutes of moderate intensity physical activity, five days of the week). Although they would be expected, as nurses, to promote this lifestyle advice to patients, many of the pre-registered nurses in this sample were not achieving these guidelines. An exceptionally high proportion of the sample (83%) did not meet generic government recommendations for healthy diet ('5-a-day') even though just under half the sample *believed* that they consumed a healthy diet. Over one quarter of the sample was overweight or obese, and around one third did not meet government recommendations for physical activity. This is based on self-reports that are more likely to over-estimate healthy eating and physical activity behaviours, and under-estimate weight, than the reverse (especially among obese participants: e.g., Lichtman, Pisarska, Raynes-Berman, Pestone, Dowling, Offenbacher, Weisel, Heshka, Matthews, & Heymsfield, 1992). Those pre-registered nurses that were overweight or obese were more likely to be inactive and have poorer dietary habits. Furthermore, around one fifth of the pre-registered nurses had low self-esteem. Over three quarters were dissatisfied with their body, and body dissatisfaction was particularly prevalent amongst those who were overweight or obese.

These factors are important as this study shows that unhealthy lifestyle behaviours, unhealthy weight, and low self-esteem are directly related to negative health promotion attitudes in pre-registered nurses. This is alarming, as a great number of pre-registered nurses appeared to lead unhealthy life, have unhealthy weight and be body dissatisfied. In those who were overweight or obese, body dissatisfaction also predicted negative health promotion attitudes.

The relationship between healthy lifestyle and health promotion attitudes was the most consistent finding across multiple analyses, irrespective of whether the participant had a healthy or unhealthy BMI. Our results corroborate previous work with nursing samples, which advocates the importance of nurses leading a healthy lifestyle in order to: promote health practices to others (Fie, Norman, & While, 2012), avoid feeling hypocritical when giving health advice (McCann, Clark, & Rowe, 2005), and be seen as a credible source of health information (e.g., Rush, Kee, & Rice, 2005). Nevertheless, leading a healthy lifestyle and maintaining a healthy weight is recognised to be a complex task for those in shift-working professions (Berger & Hobbs, 2006).

This study showed that pre-registered nurses with a healthier lifestyle felt more competent to deliver health promotion. As would be expected, feelings of competence for health promotion also increased with a greater level of training from progression through the course. Year of study, however, did not show a significant impact in any of the other analyses, suggesting that the level of exposure to clinical placements and university training was relevant only to feelings of competence in health promotion, and not with other attitudes towards health promotion and healthy lifestyle behaviours.

With regards delivery of health eating advice, the majority of the pre-registered nurses felt that promotion of healthy eating would be an important aspect of their role as a qualified

311 nurse. A minority held the view that promoting a healthy diet should be undertaken by
312 dieticians. Although this view was held by a small number of individuals, it is perhaps
313 important to investigate this further if the next generation of nursing professionals are indeed
314 to 'make every contact count' (NHS Yorkshire and the Humber, 2011a; 2011b).

315 The majority of the pre-registered nurses in this study thought that nurses *should* be
316 role models for health, which is consistent with previous findings (e.g., Blake et al., 2011;).
317 In addition to focusing on the health behaviours of pre-registered nurses, a small number of
318 participants reported that a lack of personal knowledge and understanding about health
319 behaviours could be a barrier to the realisation of this. There may be a need to increase the
320 focus on healthy lifestyle behaviours within nurse education, not only related to patient health
321 promotion but the translation of this knowledge to the nurse's own behaviours.

322 The association between body dissatisfaction, BMI and negative health promotion
323 attitudes in those who were overweight or obese is concordant with previous research
324 showing that pre-registered nurses with BMI > 25 are more likely to express negative
325 attitudes toward being role models for health than those with healthy BMI (Blake & Harrison,
326 2013). Some participants that expressed negative HPA gave specific reasons for this, relating
327 to their own body weight or self-perception: "being overweight", "obese", or "having poor
328 self/body-image". Conversely, we found that self-esteem has a positive relationship with
329 HPA among pre-registered nurses. As such, building self-esteem and improving self-
330 perception in this population may help to foster positive health promotion attitudes. This
331 needs to be tested further as the correlational data presented here do not allow for assessment
332 of cause and effect. Additionally, the measurement of self-esteem might be investigated
333 further using job role-specific measures.

Overall, we propose that encouraging and facilitating healthy lifestyle behaviours and building self-esteem amongst pre-registered nurses may help to generate and sustain positive attitudes towards health promotion. These positive attitudes may then be taken forward post-registration as a nurse, and enhance feelings of competence in delivering health promotion as they gain further experience in clinical settings. Supporting pre-registered nurses in making healthy diet and exercise lifestyle choices may help to enhance body satisfaction, particularly in those who are dissatisfied with their body or have negative self-perception; in our study these individuals tended to be those who were overweight or obese. This may have further secondary benefits for fostering positive health promotion attitudes. This task is complex, although educating pre-registered nurses about healthy lifestyles, facilitating healthy choices and fostering self-esteem and positive self-perception might be a first step towards achieving a healthier nursing workforce in the future.

This important goal might be accomplished through a combination of education, training and services to support health and wellbeing in nurses. Firstly, nursing curriculum should be reviewed to ensure that healthy lifestyle behaviours are embedded in two ways: [1] knowledge about the importance of healthy lifestyle behaviours for health, and an understanding of government recommendations for healthy lifestyle behaviours in order to effectively health promote to patients; [2] understanding of the importance of translating health promotion knowledge to nurse's own lifestyles, the potential impact of personal lifestyle choices on nurse's own health, and the influence of nurses as role models on patient care (potential influences on patient care through their own willingness to health promote to patients, and/or the patients heeding their advice). The former is usually included within pre-registration curriculum, although there may be opportunities to enhance training around health promotion further, perhaps using simulation methods for pre-registered nurses to gain confidence in health promotion practice. Training on the translation of knowledge to personal

lifestyle choices, and the potential influence of the nurse's health behaviours on patient care is rarely embedded within taught courses. There is a clear need to incorporate additional training on *how* pre-registered nurses can develop and sustain healthy lifestyle behaviours themselves, and *how* this might be achieved whilst at work, university or on busy practice placements. Some early efforts were made to address this need, through electronic learning tools offered in some institutions to promote health amongst student and registered nurses, for example, in Taiwan (Hsiao, Chen, Gau, Hung, Chang, & Tsai, 2005; Yu & Yang, 2006). More recently, in the UK, online packages have been developed to promote health and wellbeing in nurses and other frontline healthcare professionals (e.g., Blake & Gartshore, 2015). Online interventions offer flexibility for balancing training on healthy lifestyle around the time requirements of academic study and clinical placements. We would advocate for this form of training to be offered routinely to pre-registered nurses, registered nurses (acting as placement mentors), and nurse educators (supporting nurse training). It may be important to consider the health behaviours and attitudes of nurse educators, and registered nurses acting as placement mentors. These individuals act as role models for their students' future nursing practice (e.g., Campbell, Larrivee, Field, Day, & Reutter, 1994) and their own attitudes and lifestyle behaviours may exert an influence on behaviours and views developed by pre-registered nurses.

As well as providing education and training, services should be offered that support the pre-registered nurses in adopting healthy lifestyle practices. Such interventions might be especially fruitful as students spend a high proportion of their daily hours within the university setting. For example, this might include provision of accessible exercise facilities or places to be physically active, encouragement of incidental physical activities (e.g., using the stairs instead of the lifts), lunchtime walking groups, pedometer challenges, health checks, healthy food options and weight management programmes. Again, online health

behaviour change interventions have shown to be effective in healthcare and academic settings and may provide opportunities for reaching those who are working shifts in hospital settings (e.g., Greene, White, Hoerr, Lohse, Schembre, Riebe, Patterson, Kattelmann, Shoff, Horacek, Blissmer, & Phillips, 2012).

Our findings from a British sample of pre-registered nurses have implications for nurse education worldwide, and for the development of initiatives in educational and healthcare settings to support the next generation of nurses in developing sustainable healthy lifestyle behaviours. In the UK, the NHS currently advocates that all healthcare professionals should 'make every contact count' (NHS Yorkshire and the Humber, 2011a; 2011b) in promoting positive health behaviours to patients and clients, as part of a nationwide initiative to improve population health. This preventative approach is advocated within nurse education around health promotion, with relation to patient care. However, this approach could be applied directly to academic settings, by nursing faculties taking every chance to raise pre-registered nurses' awareness of health promotion in their own life. 'Making every contact count' should be continually emphasised in nurse education, since healthcare students' knowledge about health behaviours does not necessarily translate into practice (Sajwani, Shoukat, Raza, Shiekh, Rashid, Siddigue, Panju, Raza, Chaudhry, & Kadir, 2009).

With regards services and interventions, positive steps might include offering healthy meal options (found to be successful in workplace settings: Agarwal, Mishra, Xu, Levin, Gonzales, & Barnard, 2015), or introducing university-based lifestyle interventions targeted specifically to pre-registered nurses (Luszczynska & Haynes, 2009). Individual behaviour change is more likely to be facilitated and sustained in health promoting environments (e.g., Larson & Story, 2009), and settings-based approaches have been applied successfully in other workplaces (e.g., see review: Quintiliani, Poulsen, & Sorensen, 2010). Supporting 'healthy universities' initiatives and improving facilities accessible to pre-registered nurses may have

potential to positively influence their lifestyle choices. However, few studies have concentrated on the effectiveness of educational institution-based interventions targeted specifically to pre-registered nurses and nurse educators, and this is likely to be because such initiatives are not very common.

In the UK, the 'Health Promoting University' initiative – a settings-based approach to health promotion within universities was proposed over 15 years ago (Dooris, 2001), but there is still inconsistency across the UK in the provision of health-promoting environments for university students. Furthermore, healthcare students often struggle to access mainstream university facilities when they are working shifts on placements, or if they are physically based on hospital sites for their education and training. In some regions, healthcare students and educators based on hospital sites may have access to workplace wellbeing programmes delivered for NHS employees. For example, Nottingham University Hospitals NHS Trust, UK (NUH NHS, 2015) delivers a pioneering health and wellbeing programme for its employees, where a vast array of health-promoting facilities and services are accessible to over 14,000 hospital staff as well as healthcare students and educators based on their sites. Following the NHS Five Year Forward View (2014), £5million has recently been invested in exemplar NHS trusts for enhancing their workplace initiatives to support and improve physical and mental health in hospital employees. Overall evaluation of the UK Five Year Forward View is forthcoming. However, evaluations of the existing initiatives delivered by the exemplar hospital trust referred to here have shown that healthcare employees, (as well as healthcare students and university employees based on their sites) engage in, and value these initiatives (e.g., Blake & Batt, 2015; Blake, Suggs, Coman, Aguirre, & Batt, 2016; Blake, Bennett, & Batt, 2014), and that they are perceived to be financially sustainable (Lee, Blake, & Lloyd, 2010).

More research is needed to determine how best build confidence for health promotion practice in pre-registered nurses, to support the translation of their knowledge and training around healthy lifestyle into their own lives, and to determine the effectiveness of various interventions and services to support pre-registered nurses in making healthy lifestyle choices. Finally, we have a limited understanding of the potential impact of nurse educators' and clinical nurse mentors' lifestyle behaviours and attitudes on those of their students, and this topic should be considered in future studies.

Limitations

The findings reported here are based on self-reported cross-sectional data from a sample of pre-registered nurses at a single institution, although participants were based on multiple hospital sites, and the demographics and health lifestyle profile of the sample were broadly comparable with samples of pre-registered nurses in previous studies (e.g., Malik et al., 2011). The healthy lifestyle index was a simple measure targeted only to diet and physical activity behaviour and does not include other aspects of healthy living. Finally, the measure of HPA is relatively new and requires validation and reliability analyses for use in future studies.

Conclusion

In this study, pre-registered nurses' health promotion attitudes depended on their own health-related dietary and physical activity practices and self-perception. Educating pre-registered nurses about the importance of their own health and wellbeing and facilitating healthy lifestyle choices at university, on placements and in their personal lives is an essential but complex task for the future. Improving the health and wellbeing of pre-registered nurses may help to foster positive self-perception and health promotion attitudes that may ultimately impact on future patient care. Pre-registered nurses should be equipped with early training

around core concepts of healthy lifestyle, including diet, physical activity and weight management. Professional training on personal health and wellbeing should be widely offered and ideally embedded within nursing curriculum. Educational institutions should seek to generate a health-promoting culture and facilitate healthy lifestyle choices amongst pre-registered nurses as our next generation of nurses, nurse educators and placement mentors.

References

Agarwal, U., Mishra, S., Xu, J., Levin, S., Gonzales, J., & Barnard, N. D. (2015). A multicenter randomized controlled trial of a nutrition intervention program in a multiethic adult population in the corporate setting reduces depression and anxiety and improves quality of life: the GEICO study. *American Journal of Health Promotion, 29*(4), 245-254.

Andajani-Sutjahjo, S., Ball, K., Warren, N., Inglis, V., & Crawford, D. (2004). Perceived personal, social and environmental barriers to weight maintenance among young women: A community survey. *International Journal of Behavioural Nutrition and Physical Activity, 1*, 15. DOI: 10.1186/1479-5868-1-15

Berger, A. M., & Hobbs, B. B. (2006). Impact of Shift Work on the Health and Safety of Nurses and Patients. *Clinical Journal of Oncology Nursing, 10*(4), 465-471.

Blake, H., Mo, P. K. H., Lee, S., & Batt, M. E. (2012). Health in the NHS: Lifestyle behaviours of hospital employees. *Perspectives in Public Health, 132*, 213-215.

Blake, H., & Harrison, C. (2013). Health behaviours and attitudes towards being role models. British Journal of Nursing, 22(2), 86-94.

Blake, H. (2014). Nurses recognise their own health can affect care quality. *Nursing Times, 110*(38), 9.

Blake, H., Bennett, E., & Batt, M. E. (2014). Evaluation of occupational health checks for hospital employees International. *Journal of Workplace Health Management, 7*(4), 247-266

Blake, H., & Batt, M. E. (2015). Employee perceptions of pedometer walking intervention in a hospital workplace. International Journal of Health Promotion and Education. DOI:10.1080/14635240.

Blake, H., & Gartshore, E. (2014). Development and evaluation of an online learning tool to enhance knowledge of workplace wellness in healthcare disciplines. *In:* Proceedings of the 10th UK Society for Behavioural Medicine Annual Scientific Meeting, 2014; 3-4 December, Nottingham.

Blake, H., & Gartshore, E. (2015). Health and Wellbeing for Nurses and Midwives. Online training: University of Nottingham, Nottingham, UK.

Blake, H., & Patterson, J. (2015). Paediatric nurses' attitudes towards the promotion of healthy eating in children and their families. *British Journal of Nursing, 24*(2), 108-112.

Blake, H., Suggs, L. S., Coman, E., Aguirre, L., & Batt, M. E. (2016). Active8! Technology-based intervention to promote physical activity in hospital employees. *American Journal of Health Promotion*. DOI: 10.4278/ajhp.140415-QUAN-143

Campbell, I. E., Larrivee, L., Field, P. A., Day, R. A., & Reutter, L. (1994). Learning to nurse in the clinical setting. *Journal of Advanced Nursing, 20*, 1125-1131.

Department of Health (2009). Cross-Government Obesity Unit. Healthy weight, healthy lives: two years on [Online]. Available at: https://www.more-life.co.uk/userfiles/dh_113495.pdf [Accessed 19 January 2014].

Department of Health (2011). UK physical activity guidelines [Online]. Available at: https://www.gov.uk/government/publications/uk-physical-activity-guidelines [Accessed 25 February 2016].

Dooris, M. (2001). The "Health Promoting University": a critical exploration of theory and practice. *Health Education, 101*(2), 51-60.

Engstrom, J. L., Paterson, S. A., Doherty, A., Trabulsi, M., & Speer, K. L. (2003). Accuracy of Self-Reported Height and Weight in Women: An Integrative Review of the Literature. *Journal of Midwifery & Women's Health, 48*(5), 338-345.

Fie, S., Norman, I. J., & While, A. E. (2012). The relationship between physicians' and nurses' personal physical activity habits and their health-promotion practice: A systematic review. *Health Education Journal, 72*(1), 102-119.

Fisher, R. A. (1956). *Statistical Methods and Scientific Inference.* New York: Hafner.

Greene, G. W., White, A. A., Hoerr, S. L., Lohse, B., Schembre, S. M., Riebe, D., Patterson, J., Kattelmann, K. K., Shoff, S., Horacek, T., Blissmer, B., & Phillips, B. W. (2012). Impact on an Online Healthful Eating and Physical Activity Program for College Students. *American Journal of Health Promotion, 27*(2), e47-e58.

Hebert, E., Caughy, M., & Shuval, K. (2012). Primary care providers' perceptions of physical activity counselling in a clinical setting: a systematic review. *British Journal of Sports Medicine, 46(*9), 625-31.

Hsiao, Y. C., Chen, M. Y., Gau, Y. M., Hung, L. L., Chang, S. H., & Tsai, H. M. (2005). Short-Term Effects of a Health Promotion Course for Taiwanese Pre-registered nurses. *Public Health Nursing, 22*(1), 74-81.

James, P. T. (2004). Obesity: The worldwide epidemic. *Clinics in Dermatology, 22*(4), 276-280.

Lacobucci, T., Daly, B., Linedell, D., & Griffin, M. (2013). Professional values, self-esteem and ethical confidence of baccalaureate pre-registered nurses. *Nursing Ethics, 20*(4), 479-490.

Lance, C. E., Butts, M. M., & Michels, L. C. (2006). The Sources of Four Commonly Reported Cut off Criteria. What Did They Really Say? *Organizational Research Methods, 9*(2), 202-220.

Larson, N., & Story, M. (2009). A Review of Environmental Influences on Food Choices. *Annals of Behavioural Medicine, 38*(S1), 56-73.

Lee, S., Blake, H., & Lloyd, S. (2010). The Price is Right: Making Workplace Wellness Financially Sustainable International. *Journal of Workplace Health Management, 3*(1), 58-69.

Lichtman, S. W., Pisarska, K., Raynes-Berman, E., Pestone, M., Dowling, H., Offenbacher, E., Weisel, H., Heshka, S., Matthews, D. E., & Heymsfield, S. B. (1992). Discrepancy between self-reported and actual caloric intake and exercise in obese subjects. *The New England Journal of Medicine, 327*(27), 1893-1898.

Lobelo, F., Duperly, J., & Frank, E. (2009). Physical activity habits of doctors and medical students influence their counselling practices. *British Journal of Sports Medicine, 43*(2), 89-92.

Luszczynska, A., & Haynes, C. (2009). Changing Nutrition, Physical Activity and Body Weight Among Student Nurses and Midwives. Effects of a Planning Intervention and Self-Efficacy Beliefs. *Journal of Health Psychology, 14*(8), 1075-1084.

Lynch, E., Liu, K., Wei, G., Spring, B., Kiefe, C., & Greenland, P. (2008). The Relation Between Body Size Perception and Change in Body Mass Index Over 13 Years. *American Journal of Epidemiology, 169*(7), 857-866.

Malik, S., Blake, H., & Batt, M. (2011). How healthy are our nurses? New and registered nurses compared. *British Journal of Nursing, 20*(8), 489-496.

Marsh, H. W., Scalas, L. F., & Nagengast, B. (2010). Longitudinal Tests of Competing Factor Structures for the Rosenberg Self-Esteem Scale: Traits, Ephemeral Artifacts, and Stable Response Styles. *Psychological Assessment, 22*(2), 366-381.

McCann, T., Clark, E., & Rowe, K. (2005). Undergraduate pre-registered nurses' attitudes toward smoking health promotion. *Nursing & Health Sciences, 7*(3), 164-174.

McElligott, D., Siemers, S., Thomas, L., & Kohn, N. (2009). Health promotion in nurses: Is there a healthy nurse in the house? *Applied Nursing Research, 22*(3), 211-215.

McMullen, T., & Resnick, B. (2013). Self-esteem among nursing assistants: Reliability and validity of the Rosenberg Self-Esteem Scale. *Journal of Nursing Measurement, 21*(2), 335-344.

Miller, C. T., & Downey, K. T. (1999). A Meta-Analysis of Heavyweight and Self-Esteem. *Personality and Social Psychology Review, 3*(1), 68-84.

National Obesity Forum (2014). State of the Nation's Waistline - Obesity in the UK: Analysis and expectations [Online]. Available at: http://www.nationalobesityforum.org.uk/media/PDFs/StateOfTheNationsWaistlineObesityintheUKAnalysisandExpectations.pdf [Accessed on 11 March 2016].

NHS (2015). Hospital trust to lead drive to improve health among NHS staff [Online]. Available at: http://www.uhs.nhs.uk/AboutTheTrust/Newsandpublications/Latestnews/2015/Hospitaltrusttoleaddrivetoimprovehealthamong NHSstaff.aspx [Accessed 25 February 2016].

NHS England (2014). NHS Five Year Forward View [Online]. Available at: https://www.england.nhs.uk/ourwork/futurenhs/ [Accessed 25 February 2016].

NHS Yorkshire and the Humber (2011a). Making Every Contact Count [Online]. Available at: http://www.makingeverycontactcount.co.uk/ [Accessed 25 February 2016].

NHS Yorkshire and the Humber (2011b). Prevention and Lifestyle Behaviour Change: A Competence Framework. 2nd ed. Available at: http://www.makingeverycontactcount.co.uk/docs/PreventionandLifestyleBehaviourChangeACompetenceFramework.pdf [Accessed 25 February 2016].

Phiri, L. P., Draper, C. E., Lambert, E. V., & Kolbe-Alexander, T. L. (2014). Nurses' lifestyle behaviours, health priorities and barriers to living a healthy lifestyle: a qualitative descriptive study. *BMC Nursing, 13*:38.

Prime Minister's Commission (2010). Front Line Care: the future of nursing and midwifery in England. Report of the Prime Minister's Commission on the Future of Nursing and Midwifery in England 2010. London: The Prime Minister's Commission on the Future of Nursing and Midwifery in England. [Accessed 25 April 2016].

Public Health England (2015). UK and Ireland prevalence and trends. Retrieved from: https://www.noo.org.uk/NOO_about_obesity/adult_obesity/UK_prevalence_and_trends. [Accessed 25 April 2016].

Quintiliani, L., Poulsen, S., & Sorensen, G. (2010). Healthy Eating Strategies in the Workplace. *International Journal of Workplace Health Management, 3*(3), 182-196.

Randle, J. (2003). Changes in self-esteem during a 3 year pre-registration diploma in higher education (nursing) programme. *Learning in Health and Social Care, 2*(1), 51-60.

Rosenberg, M. (1965). *Rosenberg Self-Esteem Scale. Society and the adolescent self-image.* Princeton: Princeton University Press.

Rush, K. L., Kee, C. C., & Rice, M. (2005). Nurses as imperfect role models for health promotion. *Western Journal of Nursing research, 27*, 166-183.

Sajwani, R. A., Shoukat, S., Raza, R., Shiekh, M. M., Rashid, Q., Siddigue, M. S., Panju, S., Raza, H., Chaudhry, S., & Kadir, M. (2009). Knowledge and practice of healthy lifestyle and dietary habits in medical and non-medical students of Karachi, Pakistan. *Journal of the Pakistan Medical Association, 59*(9), 650-655.

Sinclair, S. J., Blais, M. A., Gansler, D. A., Sandberg, E., Bistis, K., & LoCicero, A. (2010). Psychometric Properties of the Rosenberg Self-Esteem Scale: Overall and Across Demographic Groups Living Within the United States. *Evaluation & The Health Professions, 33*(1), 56-80.

Spurgas, A. (2005). Body Image and Cultural Background. *Sociological Inquiry, 75*(3), 297-316.

Stunkard, A. J., Sorensen, T., & Schilsinger, F. (1983). Use of the Danish Adoption Register for the study of obesity and thinness. *Research Publication - Association for Research in Nervous and Mental Disease, 60,* 115-120.

World Health Organisation (2014). Health Promotion [Online]. Available at: http://www.who.int/topics/health_promotion/en/ [Accessed on 22 February 2016].

Yu, S., & Yang, K. F. (2006). Attitudes toward web-based distance learning among public health nurses in Taiwan: A questionnaire survey. *International Journal of Nursing Studies, 43*(6), 767-774.

Table1. Items creating Health Promotion Attitude (HPA) scale, with scale's description.

No	Item
1	*Health promotion should be part of a nurse's job role.*
2	*Nurses I have worked with on placement give sufficient health promotion advice.*
3	*Nurses I have worked with on placement take all opportunities to give health promotion advice.*
4	*Nurses are good role models for health.*
5	*I think I will find it hard to promote health behaviours if I do not carry them out myself.*
6	*Overweight or unhealthy nurses are seen to be less competent at their job.*
7	*Being a healthy weight is important for certain roles as a nurse.*
8	*Patients will find it easier to connect with me if I display health behaviours which are perceived to be of a real person rather than idealistic.*
9	*I feel under pressure to be a role model for health.*
10	*Patients will find it easier to take my advice if I am seen to be following it myself.*
11	*All nurses should have a healthy diet and exercise regularly.*
12	*I wouldn't take healthy eating advice from an overweight nurse.*
13	*The level of obesity in this country concerns me.*
14	*I have had adequate education to give effective health promotion advice.*

Note. Response categories were: 'strongly agree' (scored 4), 'agree' (scored 3), 'ambivalent' (not scored), 'disagree' (scored 2) and 'strongly disagree' (scored 1). Inclusion of the 'ambivalent' category allowed for expression of either definite or mixed feelings, and did not force an extreme stance on items that may be perceived as controversial or sensitive. However, ambivalent responses were not included in the analyses. The statements were generated by the authors, and were based on concepts identified from the literature that were relevant to the study aims, and prior use of items within similar studies (Blake & Patterson, 2013). The statements were pilot tested with a panel of 10 individuals (5 nurse educators, and 5 pre-registered nurses). The reliability of the full scale was equal to Cronbach's α =.60, which was deemed sufficient for the early stage of research with this scale (Lance, Butts, & Michels, 2006).

Table 2. Demographic characteristic of student nurses who fully completed the study.

Variable	Full sample n=493	Underweight or Healthy weight n=354 (72%)	Overweight or Obese n=139 (28%)	*p*
Age	M=25.36 (SD=6.42) n=490	**M=24.22 (SD=5.06) n=353**	**M=28.31 (SD=8.34) n=137**	**<.001**
Gender	90% F (n=444)	**92% F (n=326)**	**86% F (n=119)**	**.03**
Year of study	23% Y1 (n=114) 43% Y2 (n=212) 32% Y3 (n=156) 2% Y4 (n=10)	24% Y1 (n=85) 43% Y2 (n=153) 31% Y3 (n=109) 2% Y4 (n=7)	21% Y1 (n=29) 43% Y2 (n=60) 34% Y3 (n=47) 2% Y4 (n=3)	.87
Branch	65% Adult (n=318) 17% Child (n=81) 19% Mental Health (n=93)	65% Adult (n=232) 18% Child (n=63) 17% Mental Health (n=59)	63% Adult (n=87) 13% Child (n=18) 24% Mental Health (n=34)	.09
Meeting PA requirements	68% YES (n=333)	**72% YES (n=253)**	**59% YES (n=81)**	**.007**
No of fruits/veg portions a day	M=3.11 (SD=1.43) n=493	M=3.11 (SD=1.45) n=353	M=3.12 (SD=1.41) n=137	.68
Perception of diet healthiness	M=6.07 (SD=1.61) n=490	**M=6.14 (SD=1.57) n=326**	**M=5.86 (SD=1.71) n=139**	**.018**
Healthy lifestyle	M=9.85	**M=9.96**	**M=9.55**	**<.05**

(PA + fruits/veg + diet healthiness)	(SD=2.88) n=487	**(SD=2.82) n=352**	**(SD=3.00) n=135**	
Self-esteem	M=1.62 (SD=.25) n=479	M=1.63 (SD=.25) n=345	M=1.60 (SD=.23) n=134	.08
Body dissatisfaction	M=.90 (SD=1.16) n=486	**M=.63 (SD=1.11) n=351**	**M=1.61 (SD=.99) n=135**	**<.001**
Health Promotion Attitude	**M=2.22 (SD=.52) n=476**	**M=2.24 (SD=.53) n=343**	**M=2.15 (SD=.50) n=133**	**.04**

Note. PA= physical activity, F= female, Y= year.

Group differences were analysed with independent-group t-tests (for age) or one-way ANOVAs (controlling for age) where appropriate (continuous variables), and $\boldsymbol{X}^2$ tests (for categorical variables).

Significant differences are indicated by bold font.

Table 3. Relationships between study variables (partial correlations); with age and gender controlled for (n=457).

	Variable	1	2	3	4	5
1	Health Promotion Attitude		.20**	-.11*	-.09	.23**
2	Self-esteem			-.02	-.11*	.03
3	Body dissatisfaction				.40**	-.08
4	BMI					-.15**
5	Healthy life-style					

Note. PA=physical activity. Healthy lifestyle = portions of fruits/veg, PA requirements and healthy diet.

BMI here is treated as a continuous variable.

Same results hold when controlling also for year of study.

* $p<.05$, ** $p<.01$

Table 4. Linear regression models predicting HPA (for full sample and overweight/obese subsample).

	Full sample n=461			Overweight/obese sample n=127		
Variable (model R^2 =.10)*	Beta (β)	*p*	95% CI	Beta (β)	*p*	95% CI
Constant	-	<.001	.70; 1.74	-	.09	-.15; 1.92
Age	.02	.65	-.006; .01	-.05	.58	-.01; .01
Gender	-.02	.69	-.19; .13	.01	.96	-.24; .25
BMI	-.01	.91	-.01; .01	.12	.22	-.01; .04
Body dissatisfaction	-.08	.09	-.10; .01	-.25	.01	-.25; -.04
Self-esteem	.19	<.001	.22; .59	.17	.04	.02; .75
Healthy lifestyle	.21	<.001	.02; .06	.32	.001	.02; .08
Year of study	.01	.83	-.05; .07	.04	.64	-.08; .13

Note. CI=confidence intervals.

*Similar results hold for healthy weight and underweight subsample only.

Table 5. Binary regression coefficients for models predicting feeling competent in delivering health advice (n=457).

Variable	B	SE	Wald statistic	*p*	95% CI	Odds ratio
Constant	.24	1.18	.04	.84	-	1.27
BMI	.006	.03	.037	.85	.95; 1.06	1.01
Body dissatisfaction	.11	.14	.61	.43	.85; 1.45	1.11
Self-esteem	.20	.46	.19	.67	.49; 3.03	1.22
Healthy lifestyle	**-.12**	**.04**	**8.80**	**.003**	**.82; .96**	**.89**
Year of study	-.23	.14	2.69	.10	.60; 1.05	.79
Age	-.01	.02	.36	.55	.95; 1.03	.99
Gender	-.44	.42	1.11	.29	.28: 1.46	.64

Note. CI=confidence intervals.

Significant predictors are written in bold.