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The use of key health questions for patient initial assessment in physiotherapy clinical practice.

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ABSTRACT

Physiotherapists are well positioned to educate patients about lifestyle behaviours to prevent, manage and in some cases reverse, non-communicable diseases. The study aimed to explore physiotherapy students' perceptions about the physiotherapists' role in health promotion and factors influencing students to ask key health questions about physical activity, smoking and sleep health. A mixed methods design was applied in a paper-based survey involving a 10 cm visual analogue scale (VAS) and open ended questions. Participants were University of Otago final year Bachelor of Physiotherapy students (n=74). Participants perceived the physiotherapists' role in health promotion to be important (87.5% in VAS strength). However, participants only asked patients about their level of physical activity, smoking status and sleep health 84.8%, 44.6% and 47.8% of the time, respectively; confidence was a significant variable influencing these percentages. Two *a priori* themes, 'clinical setting' and 'knowledge regarding key health questions' were established, then factors influencing students in asking key health questions were explored. The major factor influencing whether participants asked key health questions was relevance to patient presentation. Participants confirmed the physiotherapists' role in health promotion is important and results provide a benchmark for the efficacy of health promotion content in entry level physiotherapy curricula.

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INTRODUCTION

Globally, the prevalence of non-communicable diseases (NCDs) is increasing, prompting a call for more emphasis on engagement in health promotion by health practitioners (Dean, 2009). This approach is warranted given that health care priorities have shifted from the prevention, cure and management of acute, infectious disease, to the present day focus on NCDs associated with global economic development (Dean, 2009). The four main NCDs: cardiovascular disease, cancer, diabetes and chronic obstructive pulmonary disease, are responsible for 82% of the deaths from NCDs (World Health Organization (WHO), 2014). By 2030, the proportion of total global deaths attributable to such NCDs is expected to increase to 70%, and the global burden of disease to 56%, an increase of 9% and 7% respectively from 2008 (Alwan et al., 2010). The rise in morbidity and mortality due to NCDs will place an increasing burden on the health care system (Taukobong, Myezwa, Pengpid, & Van Geertruyden, 2014). Furthermore, the effect of NCDs on the well-being and life expectancy of affected individuals impacts social, human and economic development (Beaglehole et al., 2011).

Lifestyle factors including physical inactivity, smoking and poor sleep health, are strongly associated with the development of NCDs, and as such many of these conditions are largely preventable, through lifestyle modification and the adoption of healthy lifestyle behaviours (Dean, 2009). For example, the WHO (2010) identified physical inactivity as the fourth leading risk factor for global mortality and recommends that in order to meet healthy living guidelines, adults aged 18 years and above complete at least 150 minutes of moderate-intensity physical activity each week. Physical activity is activity that requires energy expenditure involving the use of muscles and includes recreational or occupational activity, transportation (e.g. walking or cycling), household chores, play, games, sports or planned exercise, in the context of daily, family and community activities (WHO, 2010).

In regard to smoking, it is known that its consequences extend beyond chronic obstructive pulmonary disease and cancer. All-cause mortality and systemic morbidity, including cancer of organs other than the respiratory tract, are increased in people who smoke (U.S. Department of Health and Human Services, 2000). Smoking was identified as the leading cause of death in 2000 within the United States of America (Mokdad, Marks, Stroup, & Gerberding, 2004). In New Zealand, the leading cause of death ranked by years of life lost in 2015 was ischemic heart disease in Māori men, non-Māori men and non-Māori females, but lung cancer, associated with smoking, was the leading cause of death in Māori females (Ministry of Health, 2015). Although tobacco consumption in New Zealand is decreasing, smoking remains a major contributor to the development of NCDs (Smokefree, 2016).

The third key modifiable lifestyle factor associated with NCDs is poor sleep health. Both quality and quantity of sleep are physiologically essential for healing, repair and recovery (Dean, 2009). Furthermore, obstructive sleep apnoea (OSA), the most common type of sleep disordered breathing, is independently associated with the development of the metabolic syndrome which involves multiple NCDs, particularly hypertension, insulin resistance and abnormal lipid metabolism (Pépin, Tamisier, & Lévy, 2012).

Many studies have demonstrated the benefits of adopting a healthy lifestyle. Ford et al. (2009) concluded from a study of 23,153 German individuals, that those who engaged in healthy lifestyle behaviours (did not smoke, engaged in physical activity for >3.5 hours/week, had a body mass index of <30kg/m^2 and followed healthy nutritional values) had 78% less risk of developing a long term condition over the eight year study period. Thus, education of the public on the benefits of a healthy lifestyle through health promotion is important.

The World Confederation for Physical Therapy (WCPT) (2016) recognises that health promotion includes a combination of educational and environmental supports for the adoption of healthy lifestyle behaviours. A number of studies have recommended that all health care professionals, including physiotherapists, incorporate health promotion as part of key services to all patients as the evidence suggests that education from health care providers about the adoption of healthy lifestyle behaviours can prevent, manage and in some cases reverse, NCDs (Dean et al., 2011; Taukobong et al., 2014).

For well over 100 years, the physiotherapy profession has had a tradition of delivering non-invasive interventions to address impairment, disease, injury, and disability (Dean, 2009). As contemporary perspectives on the prevention and management of lifestyle conditions focus on healthy lifestyle education and simultaneous health behaviour change, physiotherapists are in a pre-eminent position to integrate health promotion into practice, particularly in the areas of physical activity, smoking cessation and sleep health, due to practice patterns that afford relatively frequent and prolonged patient contact (Dean, 2009; Walkeden & Walker, 2015). Furthermore, Walkeden and Walker (2015), in their investigation of the perceptions of physiotherapists regarding their role in health promotion, found participants generally perceived that health promotion, particularly in relation to physical activity and smoking cessation, was within their scope of practice.

The WCPT's description of physical therapy includes the fact that physical therapy practice is responsive to societal health needs, is not limited to direct patient care and also includes health promotion and the incorporation of public health strategies (WCPT, 2016). Whilst there is agreement within the literature of the need to focus the profession towards health promotion, some evidence suggests engagement in health promotion by physiotherapists has been disappointing (Walkeden & Walker, 2015). Dean et al., (2014) have suggested no current benchmark exists for health promotion content in entry level health professional curricula. Yet as health professionals, physiotherapists are expected to demonstrate proficiency in the assessment and outcome evaluation of health behaviours related to NCDs and their risk factors. Furthermore, there is limited evidence to suggest how much emphasis is placed on health promotion in entry level curricula and how effectively entry level education on health promotion has been translated into students' perceptions about the importance of asking key health questions and influencing health behaviours in physiotherapy clinical practice.

Physical activity, smoking status and sleep health are key factors that a physiotherapist has the potential to influence in managing their patients. This mixed method study aimed to explore physiotherapy students' perceptions about the role of physiotherapists in health promotion, and secondly to explore factors that influence students when asking about physical activity, smoking status and sleep health, during an initial patient assessment.

METHODS

Design

A descriptive, mixed method design was used. A paper-based questionnaire was developed to determine the use by participants of three key health-related questions: physical activity, smoking status and sleep health, in initial patient assessments in physiotherapy clinical practice. Ethical approval for this study was obtained from the University of Otago Human Ethics Committee before the research commenced. Prior to participation, each student gave written informed consent.

Participants

University of Otago Bachelor of Physiotherapy (BPhty) students in their fourth year of study were invited to participate. Students who completed their six week research module prior to the survey being circulated in July 2016, and had thus not attended a clinical placement during that time, were excluded to reduce potential recall bias. Within two weeks of completing their most recent clinical placement, students were contacted by the research supervisors via group email and invited to participate in the study at a time scheduled during a pre-placement professional development day the following week. A copy of the Participant Information Sheet was included. Paper-based questionnaires were subsequently distributed to students based in the Christchurch, Dunedin and Wellington centres. The survey took approximately 15-minutes to complete.

Survey

A paper-based survey that included both open and closed questions was developed by the research supervisors with input from the student researchers. In an earlier pilot study content validity of the questions was checked by a cohort of physiotherapy student volunteers (n=5) not included in the study who agreed to be interviewed and also consider key themes relevant to the survey questions. The interview was recorded and later transcribed verbatim by the student researchers.

The survey investigated physiotherapy students' perceptions of the role of physiotherapy in health promotion; how often students ask key health questions in the areas of physical activity, smoking cessation and sleep health; students' confidence in asking such questions; and other facilitators and barriers to their role in health promotion, that were experienced during their most recent clinical placement. All items were scored on a 10 cm horizontal Visual Analogue Scale (VAS) measuring from left to right (quantitative component), with additional comment sections allowing participants to voluntarily reply to open questions (qualitative component) (Wewers & Lowe, 1990). Questions relating to general demographic information including age, sex, ethnicity, recent placement type and tertiary level qualifications were also included, in order to describe the participant group.

Data extraction and analysis

Prior to circulation, a unique identifying code was allocated to each paper-based questionnaire by the study supervisors. All completed questionnaires were returned anonymously and results entered into an Excel file by student researchers (BP, MC) for statistical analysis. Two others (AC, MG), acted as auditors and systematically reviewed the data to ensure accuracy of entry and identify outliers or missing data. Furthermore, when an outlier was identified, the data were checked by another student researcher (BP), who recorded and corrected any errors.

Data were coded based on student responses. Results from the measurements taken from left to right of marks placed on the VAS lines were converted to an expression of percentage where 100% represented responses that were "most important", "asked the question all the time" and "total confidence". Each mark on the VAS was measured from the left end in centimetres to the nearest millimetre. To convert this to the "percentage of importance"/"frequency of asking key health question"/"confidence in asking the key question", the centimetre measurement was converted to a ratio and reversed before making it a percentage using the formula:
$= (1 - \chi/10\ cm) * 100\%$, where $\chi = measurement\ in\ cm$.

Age was calculated from the date of birth in years to the nearest two decimal places. Ethnicities were re-grouped and numerically coded based on keywords matching the 2013 New Zealand Census for major ethnic groups (Statistics New Zealand, 2013). Where two or more key areas of work in the clinical placement undertaken (Question A8) were selected, a "main" area was determined as being the area where the student spent 50% or more time in that key area of work.

Descriptive analyses were performed in Excel to provide basic quantitative descriptions of the demographic data. More in-depth descriptive analysis was also performed in Excel to find the mean value for "how often" each key health question was asked in each key work area. The responses to questions A6 *(importance of physiotherapy in health promotion)*, A9, A10, A11 *(how often participants asked key questions)* and A13 *(confidence in asking each key question)* were stratified into three categories based on their converted percentage scores from the 10 cm VAS: highly important/often/confident (80-100%), moderately important/often/confident (50-80%) and less important/often/confident (<50%).

Statistical analysis was performed using Statistical Package for the Social Science (SPSS) Version 20 (IBM Corporation, New York, USA). Questions A6 *(importance of physiotherapy in health promotion)*, and A9, A10, A11 *(how often the student asked about the level of physical activity, smoking status, and sleep health)* were set as one dependent variable in each analysis, with every other nominal or scalar variable set as the independent variables. For respondents with two key areas of work (Question A8) of equal percentage, their data were collapsed into two data points (e.g. inpatient and outpatient) having two identical dependent variable values. A univariate linear regression was performed for each independent variable to the dependent variable. Independent variables were selected to be included in multiple regression analysis if $p<0.25$; when there were more than seven independent variables, those with $p<0.1$ were selected.

The student participants' perceptions of the role of physiotherapists in asking key health questions were explored using thematic template analysis as a general approach for qualitative data. Two researchers (GK, MG) independently identified themes through close reading of the transcript derived from the interview of the cohort of physiotherapy students who had participated in the pilot study, and organised the themes into a coding template (Brooks, McCluskey, Turley, & King, 2015). Themes were then organised into different hierarchies, with those related to each other clustered together to produce higher order codes. A third researcher (MC) then moderated the initial themes developed. Codes were modified or discarded through multiple revisions with consensus reached among student researchers, which led to the emergence of two *a priori* themes (Brooks, McCluskey, Turley, & King, 2015). Two researchers (GK, AC) further analysed open question qualitative data responses from the surveys, clustering the related concepts.

Differences in the emerging concepts were then discussed amongst the researchers until a consensus was reached, in order to develop the final subthemes.

RESULTS

Based on the inclusion and exclusion criteria, a population of 84 students was identified, of whom n=74 (88.1%) (20 males, 54 females) agreed to participate and completed the questionnaire. Sixty one questionnaires (82.4%) were completed in full, while 13 (17.6%) had some incomplete data or an invalid answer but were still able to be included. The survey had 15 questions with a mix of quantitative and qualitative data comments (50 inputs per questionnaire) resulting in 3,700 inputs for 74 completed questionnaires. Cross-checking revealed 18 input errors (0.49%); 40 outlier-checks identified one input error (0.03%). These input errors were then corrected prior to further analysis. The VAS on the questionnaires were measured to be 9.5 cm instead of the planned 10 cm due to a distortion on printing. As such, the formula used to convert percentages was also adjusted to =(1-x/9.5 cm)*100% to maintain the ratio of the line.

Table 1: Demographic data for final year Bachelor of Physiotherapy student participants (n=74)

AGE (years)		
Mean SD (Range)	23.33 SD 4.06 (20.74 – 47.38)	
Median	22.13	
SEX	n	Percentage of total (%)
Male	20	27
Female	54	73
ETHNICITY GROUPS	n	Percentage of total (%)
European	52	70
(NZ European)	(47)	(64)
Māori	1	1
Asian	12	16
Pacific Peoples	0	
MELAA (Middle Eastern/Latin American/ African)	2	3
European and Māori	5	7
European and Asian	2	3
LOCALITY	n	Percentage of total (%)
Local student	72	97
International student	2	3
YEARS OF TERTIARY EDUCATION		
Mean SD (range)	4.60 SD 1.25 (3-10)	
	n	Percentage of total (%)
≤4 years	52	70.3
4-6 years	15	20.3
≥7 years	7	9.4

Note: SD, standard deviation

The demographic data for n=74 student participants are included in Table 1. A clinical rotation in acute/intensive care, in a District Health Board (DHB), (n=20) and a DHB inpatient rehabilitation setting (n=19) were the two clinical placements most frequently selected in the survey as being the most recent clinical rotations experienced by participants (Table 2).

Table 2: Core clinical areas and associated key areas of work described by participants for their most recent clinical placement

Clinical Placement Descriptor	n	Percentage of total (%)
Musculoskeletal	15	20
Neuro-rehabilitation	22	30
Cardiopulmonary	17	23
Community	17	23

				Mean percentage (%) for how often participants asked each key question		
No.	Key Area of Work	n	Percentage of total (%)	Physical Activity (A9)	Smoking Status (A10)	Sleep Health (A11)
1	School of Physiotherapy Clinic	4	5	89.47	69.21	60.79
2	DHB Acute Care/ICU	20	26	90.58	47.00	26.63
3	DHB Inpatient rehabilitation	19	25	91.69	32.99	36.62
4	DHB Outpatients	9	12	91.52	61.05	76.37
5	Care of the Elderly	0				
6	A school	0				
7	Paediatric Outpatient	3	4	65.26	2.81	90.88
8	Community rehabilitation	8	10	83.42	66.71	66.97
9	Spinal Unit	1	1	29.47	20.00	77.89
10	Rural Hospital	0				
11	Burns Unit	0				
12	Private Practice - General	10	13	89.79	52.42	75.26
13	Sports Injury Clinic	1	1	35.79	6.32	
14	Occupational Health	0				
15	Other	2	3	70.79	40.53	75.79

Notes: n, number of participants; No., the number listed as the key area of work for the clinical placement identified and used in the survey questions A5, A8, A9, A10, and A11 in response to the key questions

Participants perceived the importance of the role of physiotherapists in health promotion to be high, mean 87.5 SD 12.3% (Table 3). Participants asked about physical activity level (mean 84.8 SD 20.1%) more than sleep health (mean 47.8 SD 35.4%) and smoking status (mean 44.6 SD 38.9%). Participants also demonstrated higher levels of confidence in asking key questions about physical activity level (mean 92.6 SD 8.6%) compared to smoking status (mean 77.6 SD 24.3%) and sleep health (mean 73.3 SD 28.6%) (Table 3).

Multiple regressions were performed with results from questions A6, A9, A10 and A11 as dependent variables (Table 4). The independent variables were selected after a series of univariate linear regressions. When A6 *(importance of physiotherapists in health promotion)* was selected as the dependent variable, none of the independent variables reached significance (Table 4). However, when questions A9, A10, A11 *(how often participants asked about level of physical activity, smoking status, and sleep health)* were each selected as the dependent variable, confidence in asking the key health questions was significant with positive coefficients; 0.35, 0.36, and 0.54 and p=0.002, p=0.003, and p=0.000 respectively (Table 4). In addition, the sex of the participant was a significant variable against question A10 *(how often participants asked about smoking status)* (p=0.006) (Table 4), with male participants asking about smoking status more frequently than females. Males 73.0% SD

24.5% (32.6 - 100%): females 37.6% SD 39.2% (0 - 100%). Question A8 *(key area of work)* was significant in relation to question A11 *(how often participants asked about sleep health)* (p=0.006) (Table 4). Sleep health was questioned most frequently in paediatric outpatients (90.9%) and least in a DHB acute/intensive care setting (26.6%) (Table 2).

Table 3: Summary of the participants' responses to the importance of the role of physiotherapists in health promotion, how often the key questions were asked, and level of confidence in asking the key questions.

Importance of physiotherapy in health promotion		
Mean SD (Range)	87.54% SD 12.32% (29.47% - 100%)	
	n	Percentage of total (%)
High (≥80%)	59	80
Moderate (50-80%)	13	18
Less (<50%)	2	3

How often participants asked each key question			
	Physical Activity	Smoking Status	Sleep Health
Mean SD (Range)	84.84 SD 20.12% (22.11 - 100%)	44.64 SD 38.95% (0 - 100%)	47.76 SD 35.43% (0 - 100%)
	n	n	n
High (≥80%)	58	24	24
Moderate (50-80%)	12	14	15
Less (<50%)	7	39	38

Confidence in asking key questions			
	Physical Activity	Smoking Status	Sleep Health
Mean SD (Range)	92.58 SD 8.61% (70.53 - 100%)	77.57% SD 24.27% (3.16 - 100%)	73.30% SD 28.62% (0 – 100%)
	n	n	n
High (≥80%)	65	37	37
Moderate (50-80%)	8	21	19
Less (<50%)	0	11	13

Note: n, 77 for "how often participants asked each key questions" (A9, A10, A11) due to some participants having more than one key place of work.

Table 4: Summary of results of multiple regression analysis completed in relation to the key health question.

Survey Question No.	Variables		Coefficients	Significance (p)
A6	Importance of physiotherapists in health promotion (n=69, adjusted R^2=0.033)			
		Major Ethnic Group	0.176	0.157
	A3	International Student	0.189	0.121
	A13	Confidence in asking about smoking status	0.083	0.519
	A13	Confidence in asking about sleep health	0.122	0.331
A9	How often participants asked about level of physical activity (n=71, adjusted R^2=0.252)			
		Major Ethnic Group	0.049	0.679
	A5	Clinical area in previous placement	-0.110	0.341
	A8	Key place of work	-0.214	0.102
	A10	How often asked about smoking status	0.093	0.475
	A11	How often asked about sleep health	0.015	0.901
	A13	Confidence in asking about physical activity	0.353	0.002
	A13	Confidence in asking about smoking status	0.226	0.089
A10	How often participants asked about smoking status (n=71, adjusted R^2=0.339)			
		Age	-0.061	0.756
		Sex	-0.309	0.006
	A4	Years of tertiary education	0.167	0.398
	A7	Location of previous placement	0.106	0.349
	A11	How often asked about sleep health	0.133	0.296
	A13	Confidence in asking about smoking status	0.359	0.003
	A13	Confidence in asking about sleep health	-0.008	0.952
A11	How often participants asked about sleep health (n=72, adjusted R^2=0.447)			
		Sex	-0.051	0.607
	A8	Key place of work	0.263	0.006
	A10	How often asked about smoking status	0.082	0.414
	A13	Confidence in asking about sleep health	0.544	0.000

Notes: Dependent variables were set with n and adjusted R^2 values with associated independent variables; the independent variables were selected after performing univariate linear regression of all independent variables against the dependent variable listed; level of significance for independent variables ($p<0.05$);

The qualitative component of this study identified two *a priori* themes via template analysis from the pilot survey. Six subthemes emerged from the qualitative student survey data collected, three for each *a priori* theme (Table 5).

Table 5: *A priori* themes and inter-related subthemes that emerged from participants' free comments for the survey data collected

A priori themes	subthemes and sub-subthemes	n	Example from participant responses; response linked to sub themes and survey question number the response was derived from.
1. Clinical Setting	1.1. Facilitator in asking key health questions		
	1.1.1. Relevance to patient presentation/treatment	49	"To find out the impact it could be having on condition" *A14*
	1.1.2. Being a standard question you need to fill out on an assessment form	17	"General assessment forms including questions regarding physical activity, smoking status and sleep health" *A14*
	1.1.3. Patient readiness to change	1	"If a patient has expressed an interest in changing" *A14*
	1.2. Barrier in asking key health questions		
	1.2.1. Relevance to patient presentation/treatment	28	"Dependant on setting, more likely to ask these types of questions in the hospital" *A12*
	1.2.2. Information already in medical notes	21	"Smoking was always indicated in the hospital notes already" *A15*
	1.3. Role model behaviours		
	1.3.1. Unlikely to ask if supervisor doesn't ask	3	"Supervisor never asked about sleep" *A15*
	1.3.2. Encouragement by supervisor to ask would increase likelihood of student asking	3	"Having my supervisor encourage me to complete a full and indepth subjective assessment" *A14*
2. Knowledge regarding key questions	2.1. Unsure of relevance	7	"Sleep unsure how relevant or why it is needed" *A15*
	2.2. Lack of experience asking the key health questions	4	"My own inexperience and discomfort at discussing sleep and smoking with strangers" *A15*
	2.2.1. Do not know how to ask the questions/do not want to make the patient feel judged.	7	"Didn't want them to feel uncomfortable if taken the wrong way" *A15*
	2.2.2. Unsure what to say after asking the questions	3	"Feel uncomfortable and not knowing how to respond. Not feeling adequately trained" *A15*
	2.2.3. Students not always given same respect by patients as physiotherapists so can be hard to educate some patients.	2	"Feels like 60 year old patient who has smoked all his life isn't going to take advice from an arrogant 21 year-old physiotherapy student" *A13*
	2.3. Lack of confidence in asking key health questions	3	"If you weren't confident of its relevance" *A15*

Note: n, number of participant responses linked to the subthemes/sub-subthemes.

Subtheme analysis identified the *a priori* theme 'clinical setting' as a facilitator to asking key health questions as seen in the positive response provided to Question A14: *"On neuro/medical ward-prior physical activity is a requisite for all assessments."*

Paradoxically, comments in response to questions A10 and A15 also identified 'clinical setting' as being a barrier to asking key health questions as quoted by another respondent: *"Physical activity is not asked to patients with a complete spinal cord injury as get emotional remembering independence before injury."*

Subthemes for the *a priori* theme 'clinical setting' also included role model behaviours, which affected the likelihood of a student asking key health questions in an initial assessment, as noted by two respondents with contrasting responses: *"My supervisor would encourage me to ask about physical activity and smoking status"; and "Supervisors never asked about smoking status."*

Qualitative data from the survey to support the *a priori* theme of 'knowledge regarding key questions', was obtained largely through responses to questions A12, A13 and A15. The responses to question A12 identified the subtheme that some students were unsure of the relevance of key questions. The responses to the questions highlighted the subtheme that students do not appear to have the specific knowledge regarding these key questions as noted by one respondent: *"Don't think I have been adequately taught about sleep health so unsure if relevant to most sport injuries."*

Responses to question A13 centred around the subtheme of students lacking confidence in asking key health questions and for question A15, lacking experience in asking key health questions was a barrier to the participants' knowledge as stated by one respondent: *"Unsure of where I would direct questions after given an answer."*

DISCUSSION

The key aim of this study was to explore physiotherapy students' perceptions about the role of the physiotherapist in health promotion. The results confirmed that University of Otago final year BPhty students believed physiotherapists had an important role in health promotion. Student participants perceived the importance of the role of physiotherapists in health promotion to be high (87.5% SD 12.3% on the VAS), with 80% of participants identifying this as "highly important" (Table 3).

The literature has suggested there is a lack of evidence identifying physiotherapists' perceptions of their role in health promotion and no previous benchmark for health promotion in the entry level curricula exists (Dean et al., 2014). However, the results of this study provide evidence for the strength of perceptions about the importance of the role of physiotherapists in health promotion and thus provide a positive response to Dean (2009), who called for an increased focus within physiotherapy on the health care priority related to NCDs. Subsequent analysis of our results showed no independent variable had a significant effect on students' perceptions of the importance of physiotherapists' role in health promotion. This may suggest that entry level education on health promotion has been successfully translated into clinical perceptions by the time BPhty students reach their final clinical year, as neither demographic nor clinical background showed any significant effect on the participants' views regarding the importance of the physiotherapists' role in health promotion.

The second aim of the study was to explore factors that influenced students in regard to asking key health questions during an initial patient assessment. Whilst it is recognised that there are many factors that contribute to the reduction in risk for NCDs, for example diet and psychosocial influences, physical activity, smoking status and sleep health are of particular interest to physiotherapists in regard to health and well-being and were thus the ones addressed. Participants identified physiotherapists' role in health promotion as highly important, but only asked patients about their level of physical activity, smoking status and sleep health 84.8%, 44.6% and 47.8% of the time respectively. No significance was found between students' perceptions of the importance of the physiotherapists' role in health promotion and how frequently they ask key health questions. One possible explanation is that while education has shaped their attitude and understanding of health promotion, in clinical practice the same emphasis may not have been placed on smoking status and sleep health compared to physical activity, by their clinical supervisors and/or role models. Dean et al. (2011) suggested education from health care providers about the adoption of healthy lifestyle behaviours can prevent, manage and in some cases reverse NCDs. In this regard, clinical supervisors have an important role to incorporate health promotion as part of key service to all patients, to help their students translate theoretical knowledge into appropriate clinical practice patterns.

The level of confidence in asking each key health question was found to be the most significant factor affecting how often students asked about physical activity, smoking status and sleep health, independent from their perceptions on the importance of physiotherapy in health promotion, with positive coefficients of 0.35, 0.36 and 0.54 respectively. However, as these coefficients were <1, other factors which influence how often participants ask the key health questions may have had an influence. In addition, it is difficult to determine the causality; whether asking the questions more often increases confidence, or being more confident leads to asking the questions more often, or a combination of the two.

The frequency of asking key health questions about smoking and sleep health was influenced by sex and key area of work respectively. Males asked about smoking more often (73.0% of the time) than females (37.6% of the time), however, there was no evidence to suggest a reason to explain the difference, other than the potential for the proportion of males and females not being evenly distributed. The students' key place of work was found to be significant in determining how often participants asked about sleep health. The findings suggested that both the role models students interacted with and the clinical setting they worked in acted as both facilitators and barriers to asking the key health questions.

Within the *a priori* theme of 'clinical setting', the most influential facilitator in asking key health questions was the relevance to patient presentation/treatment (n=49). Participants frequently stated that knowing their patient's physical activity level was important for the assessment, as it could help with the development of the patient's goals and provide a baseline from which to establish goals. Although physical activity was the main area identified, participants made few comments about the need for information on smoking status and sleep health to be a priority in assessment.

The literature shows that smoking and poor sleep health contribute to the increasing global incidence of NCDs alongside physical inactivity (Dean, 2009), yet students did not associate these two key areas of health promotion with a patient treatment plan and assessment. When smoking status and physical activity were included in an assessment form, participants (n=17) identified this as a facilitator to asking these questions. Assessment forms acted as a facilitator, prompting participants to ask these key health questions although this may not necessarily translate into their treatment plan as there was an apparent lack of association, specifically with smoking status and sleep health.

'Clinical setting' also acted as a barrier to asking key health questions. Participants (n=28) indicated that if asking about physical activity, smoking status or sleep health was not directly relevant to the patient presentation/treatment in their opinion, they were less inclined to ask. Participants often stated in the questionnaires that sleep health was not relevant to their patient, yet did not elaborate on reasons. This could indicate that participants did not understand the role of sleep health in healing, repair and recovery and the development of NCDs and thus did not link the relevance to their patient (Dean, 2009; Pépin, Tamisier, and Lévy, 2012). Furthermore, 21 participants stated information from these key health questions was already in the patient's medical notes, particularly smoking status, so did not ask the question again. While best practice guidelines for smoking cessation stress that tobacco use should be addressed at every patient contact (McIvor et al., 2009), the results of our study suggested participants did not follow this line of reasoning as they addressed this key area only 44.6% of the time.

The subtheme of role modelling behaviours was identified by participants (n=6) to impact their use of key health questions. A few participants (n=3) stated they would be unlikely to ask if their supervisor did not, while other participants (n=3) stated that encouragement from their supervisors would influence them to ask these questions more. The responses supported the fact that role models, such as clinical supervisors, can impact on the development of a student's clinical practice patterns.

The second *a priori theme*, 'knowledge regarding key health questions', revealed that participants were unsure of the relevance of the key health questions and lacked both experience and confidence in asking these key questions. Some participants were unsure of the relevance of sleep health in particular and stated greater lecture content was dedicated to physical activity and smoking status throughout undergraduate education than to sleep health. Therefore, increased emphasis may need to be placed on sleep health education within the entry level curriculum. Other participants (n=7) stated that they did not know how to ask the key health questions and did not want to make the patient feel judged. This could be due to inexperience or indicate an area for further education.

Strengths and Limitations

Our study had several strengths. A mixed method approach was used, allowing analysis of key themes and exploration of subthemes. Qualitative sections in this survey provided an opportunity for freedom of perceptions to be put forward anonymously, linking with quantitative data to allow comprehensive analysis of results which addressed issues that are highlighted in this study. In addition, the 10 cm horizontal VAS used in this study has been shown to have good reproducibility and is less likely to be subject to respondent error due to the angle at which the VAS is viewed (Dixon & Bird, 1981; Revill et al., 1976). Furthermore, based on the high response rate (88.1%) to this survey, there was a greater likelihood for the questions answered in this study to be representative of the target population, minimising the probability of non-respondents error (Cook et al., 2000; Tomaskovic-Devey et al., 1994). In addition, errors were minimised through two independent cross checks (0.49%) and one outlier check of the data input (0.03%).

There are a few limitations to this study. Some participants had undertaken only two clinical placements and a research rotation, while other students had undertaken three clinical placements prior to completing the survey. Therefore, it is not possible to determine whether a difference in the amount of clinical placement experience influenced participants' responses. Furthermore, this study involved final year BPhty students from the University of Otago and therefore cannot be generalised to final year students from other physiotherapy entry level programmes around the world.

CONCLUSION

University of Otago final year BPhty students perceived physiotherapists to have an important role in health promotion. This suggests entry level education has been successful in instilling this perception and the reasoning behind it. Confidence was found to be the most significant factor affecting the frequency with which students asked the key health questions. Furthermore, the results of the study also identified that knowledge regarding key questions, role modelling, and the clinical setting also influenced how often students asked key health questions and that the participants were more likely to ask about level of physical activity than smoking status or sleep health.

In future it would be helpful to explore the perceptions regarding key health questions of final year students from other physiotherapy entry level programmes around the world, so a benchmark can be established and the role of the physiotherapist in health promotion highlighted. Effective education for physiotherapy students that incorporates health promotion in regard to physical activity, smoking cessation and sleep health is fundamental to their future role in promoting healthy lifestyles to their patients.

KEY POINTS

1. Physiotherapists have an important role in health promotion, in particular in relation to the global health issues associated with non-communicable diseases.
2. Final year physiotherapy students appreciated the relevance of asking patients key health questions but were more likely to ask about level of physical activity than smoking status or sleep health.
3. Effective education for physiotherapy students that incorporates health promotion in regard to physical activity, smoking cessation and sleep health is an essential part of the entry level curriculum.

DISCLOSURES

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APPENDIX: The use of key health questions for patient initial assessment in clinical practice

The survey questions aim to examine your recall and opinions in regard key questions applicable to general health in a patient assessment during your recent clinical placement. Please follow the instructions and answer all questions in each Sections A-C.

Section A General information

A1	What is your date of birth?	_____/_____/_____ A2 What is your sex? _____
A2	What ethnic group/s do you belong to? Tick all those relevant	☐ NZ European ☐ Tongan ☐ NZ Maori ☐ Niuean ☐ Cook Island Maori ☐ Chinese ☐ Samoan ☐ Indian ☐ Tokelauan ☐ Other state which e.g. Dutch, Japanese _____
A3	Are you an international student?	☐ YES ☐ NO
A4	How many years have you been enrolled in tertiary education?	_____
A5	What paper have you just completed in Rotation (R) 3?	☐ Phty455 ☐ Phty456 ☐ Phty457 ☐ Phty458
A6	In your opinion to what extent is health promotion (e.g. physical activity, smoking, sleep health) important for physiotherapists to address when working with patients? Mark 'X' on the 10cm line that best represents your answer.	*Very important* *Not at all important* Comment:
A7	What location were you in for Rotation3?	☐ Hastings ☐ Palmerston North ☐ Lower Hutt ☐ Wellington ☐ Nelson ☐ Christchurch ☐ Timaru ☐ Dunedin ☐ Invercargill ☐ Other _____

A8 Please select your key place/s of work in Rotation 3

☐ 1) S of Phty Clinic ☐ 2) DHB acute care/ICU ☐ 3) DHB Inpatient rehabilitation
☐ 4) DHB Outpatients ☐ 5) Care of the Elderly ☐ 6) A school
☐ 7) Paediatric Outpatient ☐ 8) Community rehabilitation ☐ 9) Spinal Unit
☐ 10) Rural hospital ☐ 11) Burns Unit ☐ 12) Private Practice - General
☐ 13) Sports injury Clinic ☐ 14) Occupational Health
☐ 15) Other _____

In the boxes below for each place ticked above briefly describe the age range of patients, the work environment and common types of conditions seen

From Qu A8 record the number of the place of work e.g. 2	Record % of the 6 week rotation at the placement e.g. 100%	AGE RANGE e.g. 18-90y	BRIEF DESCRIPTION OF PATIENTS AND ENVIRONMENT e.g. surgical ICU and pre and post op adults in acute care high dependency and surgical wards	COMMON CONDITIONS TREATED e.g. Cardiac surgery, colectomy, PVD

A9 For each of the numbers ticked in Qu A8 please mark 'X' on the 10cm line that best represents how often you asked the question relating to their normal level of physical activity in your initial assessment of each patient. Please feel free to comment on your selection/s.

A8 No _____ Comment:
Always asked *Never asked*

A8 No _____ Comment:
Always asked *Never asked*

A8 No _____ Comment:
Always asked *Never asked*

A10	For each of the numbers ticked in Qu A8 please mark a 'X' on the 10cm line that best represents how often you asked the question relating to their (or parent/guardian's) smoking status in your initial assessment of each patient. Please feel free to comment on your selection/s	*A8 No* _____ *Always asked* — *Never asked* |_____|	Comment:
		A8 No _____ *Always asked* — *Never asked* |_____|	Comment:
		A8 No _____ *Always asked* — *Never asked* |_____|	Comment:
A11	For each of the numbers ticked in Qu A8 please mark 'X' on the 10cm line that best represents how often you asked the question relating to their sleep health in your initial assessment of each patient. Please feel free to comment on your selection/s	*A8 No* _____ *Always asked* — *Never asked* |_____|	Comment:
		A8 No _____ *Always asked* — *Never asked* |_____|	Comment:
		A8 No _____ *Always asked* — *Never asked* |_____|	Comment:
A12	Do you have any other comments about the relevance of the three themes: physical activity, smoking status and sleep health, in your patient assessments during your last clinical placement?	Comment:	

A13 In your patient assessments on your recent clinical placement, mark 'X' on the 10cm line to indicate how confident you felt asking questions about each of the three key health themes: Please feel free to include comments to explain your level of confidence for each

Physical activity
Totally confident — *Not at all confident* Comment:

Smoking status
Totally confident — *Not at all confident* Comment:

Sleep health
Totally confident — *Not at all confident* Comment:

A14 In the space below please state any factors you can identify from your clinical placement that encouraged you to ask your patients questions regarding physical activity, smoking status and sleep health.

A15 In the space below please state any factors you can identify from your clinical placement that discouraged you from asking your patients (or parent/guardian) questions regarding physical activity, smoking status and sleep health.

THANK YOU FOR COMPLETING THE SURVEY

Table 1. Demographic data for final year Bachelor of Physiotherapy student participants (n=74)

Table 2. Core clinical areas and associated key areas of work described by participants for their most recent clinical placement.

Table 3. Summary of the participants' responses to the importance of the role of physiotherapists in health promotion, how often the key questions were asked, and level of confidence in asking the key questions.

Table 4. Summary of results of multiple regression analysis completed in relation to the key health question.

Table 5: A priori themes and inter-related subthemes that emerged from participants' free comments for the survey data collected