

Evaluating the impact of a training module for pre-professional health students in the delivery of clinical prevention and physical activity behaviour change

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Abstract

Purpose – This study evaluated the impact of a clinical prevention training module embedded within a clinical placement, aimed at enhancing pre-professional health students' perceived knowledge, skills and confidence in delivering clinical prevention and physical activity behaviour change support.

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Design/methodology/approach – The training module consisted of two parts: an online theoretical component, and a mid-placement interprofessional activity involving case-based discussion and reflective practice. Conducted within a multidisciplinary student placement at Logan Healthy Living, a type 2 diabetes allied health service in Logan, Queensland, the mixed-methods evaluation included pre- ($n = 44$) and post- ($n = 41$) placement surveys, feedback surveys ($n = 36$) and semi-structured interviews with students ($n = 15$), clinical educators ($n = 2$) and key interest-holders ($n = 2$). Quantitative and qualitative data were analysed using appropriate non-parametric statistical tests and inductive thematic analysis, respectively.

Findings – Survey findings showed statistically significant improvements ($p < 0.001$) in students' perceived knowledge, skills, and confidence across all domains (clinical prevention; behaviour change; physical activity) following the training module. Qualitative insights highlighted the module's value in reinforcing interprofessional collaboration, enhancing clinical communication and supporting real-world application. Suggestions for improvement included diversifying case studies, simplifying materials, strengthening links between online content and clinical application and providing broader context beyond diabetes. Structural factors such as placement variability and organisational support emerged as critical for successful implementation of the training module.

Originality/value – The findings support the module's potential to contribute meaningfully to clinical prevention education for pre-professional health students but underscore the need for the training module to be modified to enable scalability and sustained engagement across varied clinical contexts.

Keywords Health promotion, Training, Physical activity, Students, Health education, Behaviour change

Paper type Research article

Introduction

In contemporary healthcare settings, the role of the health professional extends beyond treatment modalities to encompass proactive strategies focused on clinical prevention care and behavioural interventions (Knežević *et al.*, 2023). Clinical prevention is focused on preventing chronic disease through health promotion and the reduction of modifiable risk factors (Hensrud, 2000) within health care settings. Two of the key risk factors that can be influenced by health professionals are movement behaviours, namely physical inactivity and prolonged sedentary behaviour (Knežević *et al.*, 2023; Department of Health and Aged Care (DHAC), 2021). Understanding and addressing these common health risk behaviours ideally starts early as part of pre-professional health training, as students represent the future frontline of healthcare provision (Pojednic and Stoutenberg, 2020; Gates *et al.*, 2020). By helping to embed an understanding of physical activity behaviour change early in pre-professional health student education, health educators and training programs can help to enhance the ability of health professionals to deliver the appropriate support to their patients.

The delivery of physical activity behaviour change requires more than just theoretical knowledge, with practical skills and effective communication strategies also necessary (Samdal *et al.*, 2017). Hence, the training of pre-professional health students should encompass not only the acquisition of theoretical concepts but also the clinical competencies and interpersonal skills needed for effective patient engagement and behaviour change facilitation (Samdal *et al.*, 2017). A systematic review exploring approaches to integrating physical activity behaviour change into pre-professional health student training concluded that structured training and education can enhance students' knowledge, skills, confidence and attitudes in delivering behaviour-related health interventions (Lehman *et al.*, 2025). Notably, a number of previous studies focus on theoretical learning or use simulated practice opportunities (Higgins *et al.*, 2020; Chernikova *et al.*, 2020; Hustad *et al.*, 2019). While these approaches are valuable, they do not provide students with sustained opportunities to apply and refine their skills with real patients in authentic clinical environments. This lack of ongoing, context-specific application represents a clear gap in the current literature and highlights the need to explore training approaches embedded within real-world clinical settings.

To address this gap, a pre-professional workforce training module was developed for pre-professional health students to undertake as part of their clinical placement. Clinical placements offer a potentially valuable setting to embed such training, as they provide authentic, supervised environments where students can integrate theoretical knowledge with practical experience, engage directly with patients and develop skills in real-time within the complexities of clinical practice (Lehman *et al.*, 2024).

The workforce training module was designed and delivered through a partnership with content experts from The University of Queensland, Health and Wellbeing Queensland and Logan Healthy Living by UQ Health Care, a community-delivered, student-infused, type 2 diabetes service in Logan, Queensland. This training module was underpinned by the Strengthening Prevention in Integrated Care Systems by Health and Wellbeing Queensland ([Health and Wellbeing Queensland, 2024](#)). This framework outlines the building blocks (e.g. workforce capacity and capability) and guiding principles (e.g. collaborative partnerships) for enabling a coordinated, cross-sector approach to sustainable chronic disease prevention in Queensland. Within this context, the module aimed to strengthen pre-professional health students' capacity to deliver prevention-focused care, with a particular emphasis on physical activity behaviour change.

The objective of this study is to evaluate the impact of a pre-professional workforce training module embedded within a clinical placement. Specifically, this study seeks to ascertain the impact of the training module in equipping pre-professional health students with perceived knowledge, skills and confidence to deliver chronic disease prevention in the context of clinical prevention, including physical activity behaviour change support. This study also aims to determine whether the existing module adequately serves its intended purpose or necessitates further modifications.

Methods

Context and study setting

The pre-professional workforce training module was integrated within pre-professional health student placements at Logan Healthy Living by UQ Health Care. Logan Healthy Living is a community-delivered, allied health service located in Logan, Brisbane, focused on offering practical support to adults for the prevention and management of type 2 diabetes ([Logan Healthy Living, 2022](#)). Logan Healthy Living is delivered by UQ Health Care in partnership with Health and Wellbeing Queensland, and supported by alliance partners The University of Queensland, Griffith University, Metro South Health and Brisbane South Primary Health Network. Logan Healthy Living adopts an interprofessional care model ([Forbes et al., 2020](#)), incorporating a unique approach where pre-professional students work collaboratively from various fields such as physiotherapy, exercise physiology, occupational therapy, dietetics, psychology and social work to deliver healthcare under shared supervision. These student placements typically span four to six weeks of full-time attendance, though some students may participate in multiple blocks, extending their placement duration. Clinical educators, who are registered professionals in their respective disciplines, provide supervision for students in their own discipline and when appropriate to scope of practice across disciplines, interprofessionally.

Pre-professional workforce training module

The training module consisted of a package of activities including a narrated PowerPoint (*Part 1*) viewed at the beginning of student placement and an interprofessional education and self-assessment activity (*Part 2*) completed mid-placement (See [Table 1](#)).

Part 1: clinical prevention training module

The clinical prevention training module was designed to be self-paced, intended to be completed before the start of the student's clinical placement at Logan Healthy Living. The module included pre-reading materials and a narrated PowerPoint presentation, with an estimated duration of 45–60 min. This timeframe accounts for the time needed to review the slides and engage with any interactive elements or discussion points included in the training. Part 1 was initially developed in partnership by the Clinical and Operations Manager of Logan Healthy Living and Clinical Prevention Manager of Health Systems Partnerships (Health and

Table 1. Clinical prevention training module structure and content

Section	Section duration	Section aims	Sample content and materials	Components	Mode of delivery
<i>Part 1: Health and Wellbeing Queensland Clinical prevention training module</i>	30–40 min	- Increase knowledge and understanding of clinical prevention - Increase confidence to incorporate prevention into routine practice - Increase awareness and utilisation of Health and Wellbeing Queensland and its program portfolio	- Information provided on clinical prevention and changing people's behaviour - Social prescribing as a key component of clinical prevention - The role of all health professionals to support patient health behaviour change and promote clinical prevention - Information provided on Health and Wellbeing Queensland programs	- <i>Narrated video:</i> Delivered as a narrated PowerPoint presentation students review 24 slides, listen to the narrated content and engage with any interactive elements such as links to related modules or discussion points included in the training, such as case studies - <i>References to existing resources:</i> Incorporated relevant external training materials	Online (asynchronous)

(continued)

Table 1. Continued

Section	Section duration	Section aims	Sample content and materials	Components	Mode of delivery
Part 2: Interprofessional education and self-assessment activity	1 h	- Enhancing skills to discuss weight, nutrition and physical activity with clients and apply the “Ask, Advise and Help” skills to support them to improve their health - Provide a variety of learning approaches including reflection, group activity, self-directed learning and application within clinical practice	- E-learning brief intervention training module (Insight – Brief interventions for a healthy lifestyle - Nutrition and physical health) - Reflection of own physical activity and dietary behaviours (using the Diet Quality Tool and Active Australia Survey) - Interprofessional activity involving discussion of case studies	(1) Brief intervention training a. Students complete an e-learning insight - brief training intervention training module (https://insight.qld.edu.au/training/introduction-to-screening-and-brief-interventions/landing) (2) Self-reflection exercise – personal physical activity and dietary behaviours a. Students complete the Diet Quality Tool + Active Australia Survey to assess their own behaviours b. Reflection and then discuss with group involving questions - What are your key reflections from your own physical activity and dietary behaviours based on the self-assessment tools? - What are your personal strengths, weakness, opportunities and threats that influence your physical activity and dietary behaviour? - How do you think your behaviours may influence the advice you provide to participants? (3) Interprofessional activity - case studies a. Review two patient case studies with medical history, social history and healthcare history (Gary and Susie) b. Facilitated group discussion of the two case studies with peers from multiple health disciplines and clinical educator guidance, involving questions - What are the key considerations that would inform your care planning for Gary and Susie? - What are the key priorities for Gary and Susie? - What members of the team would you recommend support the care of Gary and Susie? - Describe the opportunities for earlier preventative healthcare for Gary and Susie? c. Reflective exercise: Students identify key priorities and considerations for prevention in case scenarios, reinforcing application to real-world contexts	In person (face-to-face, clinical placement setting)
Summary of materials	Pre-reading materials, narrated PowerPoint video, e-learning module, group case studies, reflection activities				

Wellbeing Queensland) at the time, both of whom have experience as clinical educators. Content was then reviewed by Logan Healthy Living clinical educators and a member of the research team (SG) and updated following preliminary student feedback. From this, existing training modules, for instance, the insight brief interventions module – brief interventions for a healthy lifestyle ([Insight, 2021](#)), were incorporated into the training. Students were encouraged and supported by clinical educators to apply concepts from the training module during patient interactions and interprofessional discussions throughout their placement.

Part 2: Interprofessional education and assessment activity

Part 2 was initially developed in partnership by the Clinical Prevention Manager of Health Systems Partnerships (Health and Wellbeing Queensland) and a member of the research team (SG). Content was then reviewed by Clinical and Operations Manager of Logan Healthy Living and member of the research team (RF). Part 2 was completed in small groups typically consisting of 4–8 students, depending on placement schedules and cohort size. Groups included students from at least two different health disciplines to support interprofessional discussion and collaboration, with participation commonly drawn from physiotherapy, exercise physiology, dietetics and other allied health disciplines represented at Logan Healthy Living. The interprofessional education and assessment activity (*Part 2*) involved a reflection by students of their own physical activity and dietary behaviour, using the Diet Quality ([Australian Bureau of Statistics, 2022](#)) and Active Australia tools ([Australian Institute of Health and Welfare, 2003](#)). Students then had facilitated group discussions of the two case studies with their clinical educator and students from all disciplines completing a placement (See [Table 2](#)). The duration of Part 2 was approximately 1 h. The timing of Part 2 midway through placement was intentionally designed to facilitate reflection on real clinical experiences and support integration of clinical prevention principles into ongoing patient care activities.

Design and recruitment

Student participants completing a placement between May 2023 to November 2024 were recruited via convenience sampling through an online link embedded in the Logan Healthy

Table 2. Part 2- Training module case studies

Gary	Susie
54yo male referred from GP for weight loss. PMHx • T2DM (HbA1c 8.6%) • Stage 2 Chronic kidney disease • Hypertension • Hypercholesterolaemia • Lower back pain • Hx of depression • Class II Obesity Social Hx • Truck driver • Lives alone, divorced, limited social supports • Lifestyle: Incidental activity only, limited by lower back pain and “bad knee” • Heavy reliance on convenience foods • Rarely checks BGLs “why bother” Healthcare History • Sees GP routinely “for pills”	44yo female referred for diabetes management PMHx • T2DM, newly diagnosed commenced metformin • Upset by diagnosis • Anxiety • Hx of gestational diabetes with 2nd child, 8 wk postnatal OGTT WNL, nil further BGL monitoring • BMI: 34 kg/m2 Social Hx • Married with 2 children 8 and 10yo • Works full time • Has gym membership, however difficulty attending due to family and work commitments • Snacks when stressed Healthcare History • Presented to new GP for investigation of fatigue • Otherwise nil regular contact since birth of children

Living online induction package. A mixed-methods approach (Creswell and Plano Clark, 2018) was used, comprising of self-report surveys and semi-structured focus groups or interviews. Students were invited to participate in a one-on-one interview or focus group mid-placement by a member of the research team (EL). Participants could opt into the surveys and interviews separately. In order to gain sufficient qualitative insights, a minimum of 10 student participants were sought for both the surveys and interviews, with the maximum number of possible participants limited by cohort size in the recruitment window; however, no formal *a priori* power calculation was conducted for the survey component due to the exploratory nature of the study and the limited cohort size available within the placement setting. Clinical educators involved in the delivery of training, and key interest-holders were also invited to participate in a one-on-one interview by a member of the research team (EL). Key interest-holders included senior representatives involved in the development, implementation or strategic oversight of the training module, specifically the Clinical and Operations Manager of Logan Healthy Living and the Clinical Prevention Manager at Health and Wellbeing Queensland. The study was approved by the Human Research Ethics Committee at The University of Queensland on 24/04/2023 (2021/HE002231) and all participants provided informed consent either verbally or in writing.

Data collection

Repeated cross-sectional surveys were administered to students at the start and at the end of their placements. Surveys were hosted online on the web-based software, Qualtrics^{XM} and were anonymous, with participant-generated codes used to match pre- and post-placement surveys. Following completion of the clinical prevention training module, student participants were also invited to complete a post-module feedback survey to assess their experiences and perceptions of the training, with the survey link embedded at the end of the educational activities. Mid-placement, all students were invited via a separate invitation email by a member of the research team to participate in a semi-structured focus group or individual interview (based on participant preference). Once all student placements blocks for the study period had concluded, clinical educators and key interest-holders were invited to participate in a one-on-one interview to explore perspectives and insights related to the training module and its purpose. All focus groups and interviews were conducted via Zoom at an agreed time (participant preference) and led by a single member of the research team not involved in the student placements. The research team member has a background in clinical exercise physiology and public health, with prior experience in conducting qualitative interviews and facilitating focus groups. A semi-structured interview guide was followed, developed collaboratively by the research team. No prior relationships existed between the research team member and the participants, and participants were informed of the researcher's role, background and the purpose of the study prior to the interview. This positionality and transparency aimed to enhance trustworthiness and reduce bias in the data collection process.

Surveys

The surveys were developed by the research team, following information gained from a review of the literature and discussions around structure and wording from experienced academics and practitioners who were not part of the research team. The pre- and post-placement surveys collected demographic characteristics, perceived knowledge, skills and confidence of clinical prevention, behaviour change and physical activity behaviour change. Demographic variables collected were participant age, sex, student status, language and education, type and duration of current placement and previous experience, defined as previous placements completed, previous experience as a health professional and any prior behaviour change training. The majority of questions asked were the same at both time points, with some demographic questions omitted at the post-placement time point. The remaining three sections (clinical prevention, behaviour change and physical

activity) included a total of 15 Likert-scale questions and two open-ended questions ([Supplementary File 1](#)). The clinical prevention section consisted of four questions, with three designed to provide information about the participants' perceived knowledge, skills and confidence regarding clinical prevention. The remaining question was related to knowledge and understanding of Health and Wellbeing Queensland prevention programs ([Health and Wellbeing Queensland, 2020](#)). The behaviour change section included eight questions: four assessed participants' perceived knowledge, skills and confidence in behaviour change, while four evaluated the perceived importance of behaviour change in clinical practice. These questions (a mix of yes/no and open-ended formats), were designed to understand participants' views on supporting behaviour change as part of their professional responsibilities and its impact on client outcomes. The physical activity section featured five questions to gauge participants' perceived knowledge, skills and confidence regarding physical activity guidelines and physical activity behaviour change, including providing support to both low-risk and complex clients. The post-training module feedback survey featured one Likert-scale question on overall satisfaction and two open-ended questions on training strengths and areas for improvement ([Supplementary File 2](#)).

Interviews

The question guide for all interviews was piloted with an expert in qualitative research (RF) and refined before commencing data collection. Focus groups and interviews with students were between 10-20 min in length (mean 12 min). Interviews, for both clinical educators and key interest-holders, were also semi-structured following a topic guide, and were between 20-40 min duration (mean 30 min). Final interview guides are provided in [Supplementary File 3](#) (student), [Supplementary File 4](#) (clinical educators) and [Supplementary File 5](#) (interest-holders). All focus groups and interviews were audio recorded.

Data analysis

Survey data

Survey data were cleaned and descriptive statistics were used to summarise the findings. To facilitate analysis and reporting, each of the Likert-scale questions were transformed into ordinal variables (i.e. Strongly disagree = 1, Somewhat disagree = 2, Neither agree nor disagree = 3, Somewhat agree = 4, Strongly agree = 5). The Shapiro–Wilk test was used to assess normality of continuous data, with all data non-normally distributed. To optimize sample size, data were repeated cross-sectional, with students able to do just the beginning of placement survey, just the end of placement survey or both. The primary analyses were undertaken utilising all data at each time point. Pre- and post-placement survey group characteristics were compared using *t*-tests. Likert-scale responses were summarised using medians and interquartile ranges (Q1, Q3). As the survey responses were non-normally distributed, Mann–Whitney *U* tests were used for unmatched analysis and Wilcoxon (paired) signed-rank tests were used for the subset of participants with matched data. Z-scores derived from the Mann–Whitney *U* and Wilcoxon signed-rank tests were reported to facilitate comparison between groups, alongside corresponding *p*-values to indicate statistical significance. Open-ended questions in the surveys were thematically analysed to identify key findings and outcomes. All quantitative analyses were conducted using the Statistical Package for Social Sciences (SPSS), version 29 (IBM Corp., Armonk, NY, USA). The significance level was set at $p \leq 0.05$.

Interview data

The lead author transcribed all focus group and interview recordings verbatim using Descript, an AI-powered transcription tool. To ensure accuracy, the transcripts were subsequently

reviewed and cross-checked against the original audio recordings by a reviewer (EL). Thematic analysis was then conducted by two researchers independently (EL and MB) using an inductive approach to condense the data into key themes, creating a list of statements reflective of the collected information (Nowell *et al.*, 2017). This method involves generating themes directly from the raw data collected, ensuring that coding is data-driven and not constrained by pre-existing frameworks related to the research question (Braun and Clarke, 2013). The researchers read the interview transcripts multiple times to become thoroughly familiar with the data prior to coding. The codes were transferred to Microsoft Word for categorisation and the creation of overarching themes, which were then refined in consultation with the senior research team (SG, RF, GH). These themes and categories were then illustrated with supporting quotes from the interviews.

Results

Surveys

A total of 68 students were invited to participate at each time point. Complete responses were available for 44 students for the pre-placement survey (response rate 65%), 41 for the post-placement survey (response rate 60%) and 36 for the post-training feedback survey (response rate 53%). A total of 23 students completed both pre- and post-placement surveys and were able to be matched. Across the whole sample, participants were a median of 23 years of age ($SD = 4.43$) and the majority were female. Most students were studying physiotherapy (39%; 49%) and were undergraduate health students (>70%). There were no large or meaningful differences in characteristics when comparing students that participated in the pre- or post-surveys. Full student characteristics are presented in Table 3 below.

Table 3. Student participant characteristics pre- and post- placement surveys

Characteristic	Student survey data Pre-placement (<i>n</i> = 44)	Post-placement (<i>n</i> = 41)
Sex, female <i>n</i> (%)	29 (60)	18 (64)
Student age (years), median (Q1, Q3)	23 (22, 27)	23 (22, 25)
<i>Discipline, n (%)</i>		
Exercise physiology	13 (30)	11 (27)
Physiotherapy	17 (39)	20 (49)
Nutrition and dietetics	10 (23)	5 (12)
Psychology	3 (7)	5 (12)
Undergraduate students, <i>n</i> (%)	32 (73)	32 (78)
Postgraduate students, <i>n</i> (%)	12 (27)	9 (22)
<i>Year of degree n (%)</i>		
1st year	8 (18)	Not collected
2nd year	2 (5)	Not collected
4th year	32 (73)	Not collected
5th year	2 (5)	Not collected
<i>Number of previous placements completed n (%)</i>		
None	11 (25)	Not collected
One	15 (34)	Not collected
Two	8 (18)	Not collected
Three or more	9 (21)	Not collected
Not specified	1 (2)	
Any previous University study, no <i>n</i> (%)	25 (57)	Not collected
Prior experience as a health professional, no <i>n</i> (%)	33 (75)	Not collected

Students perceived knowledge, skills and confidence

At the start of their placement, most students felt knowledgeable about clinical prevention (68%) and confident in general prevention activities (64%), but fewer felt skilled in social prescription (43%) or were aware of Health and Wellbeing Queensland health promotion programs (27%). While 82% understood behavioural influences, only 54% felt skilled in behaviour change strategies and confidence in supporting complex clients was lower (50%). In the physical activity domain, 82% reported that they knew the physical activity guidelines, and 73% were confident in discussing behaviour change, but only 32% felt confident supporting complex clients. All students (100%) saw behaviour change support as a professional responsibility, and 86% believed it improves health outcomes for patients. Full results are in [Table 4](#).

When comparing all available data before and after placement (unmatched analyses), the student survey data showed significant improvement across all three domains: clinical prevention, behaviour change and physical activity ($p < 0.001$). Students also reported increased perceived knowledge of clinical prevention principles, greater confidence in implementing prevention strategies and improved familiarity with Health and Wellbeing Queensland programs. Understanding of behavioural influences and confidence in applying behaviour change strategies also increased, along with perceived capability in supporting low-risk and complex condition clients. In the physical activity domain, students showed enhanced perceived knowledge of Australian guidelines, and greater confidence in advising on physical activity behaviour change, along with greater perceived capability in supporting low-risk and complex condition clients with physical activity behaviour change. Full results are presented in [Table 4](#).

Matched analyses ($n = 23$) revealed a significant post-placement increase in students' perceived confidence in implementing social prescription activities and knowledge of Health and Wellbeing Queensland prevention programs. Students also reported greater perceived skills in behaviour change strategies and increased confidence in supporting both low-risk and complex clients in making healthy behaviour changes. Similarly, confidence in providing physical activity behaviour change support improved for both low-risk and complex clients. No significant changes were observed in matched students' overall knowledge of behaviour change, physical activity or Australian physical activity guidelines. Full results are presented in [Table 4](#).

Post-training module feedback survey regarding satisfaction and recommendations

Findings from the post-training module feedback survey indicated that participants found the training to be well-delivered, comprehensive and effective in fostering understanding and collaboration among different health disciplines. The open discussion format and group discussions were particularly appreciated. The majority (94%, $n = 36$) of participants reported positive responses regarding the clinical prevention training, with 33 participants agreeing they were satisfied with the training provided. Two participants (6%) were unsatisfied with the training. No students were neutral on the topic.

Participants found that the training helped to emphasise the importance of early intervention, patient education and the integration of the social determinants of health to improve patient outcomes.

Key learnings surround the idea that early intervention is very important and can make a significant difference in treatment for clients. It is important to consider all members of the inter-professional team to ensure the most effective client care. (Student participant)

Suggestions to improve training

A number of recommendations to improve the training were provided. Participants indicated the training could be longer and more varied to cover a broader range of topics, in addition to

Table 4. All health student participants perceived knowledge, skills and confidence in relation to providing clinical prevention, behaviour change and physical activity behaviour change, pre- and post-placement

Variable	Student survey data Disagree/Strongly disagree n (%)		Agree/Strongly agree n (%)		Median (Q1, Q3)		Z score	
	Pre- placement (n = 44)	Post- placement (n = 41)	Pre- placement (n = 44)	Post- placement (n = 41)	Pre- placement (n = 44)	Post- placement (n = 41)	All participants Pre (n = 44), post (n = 41)	Matched (n = 23)
<i>Clinical Prevention</i>								
I have a good knowledge and understanding of the principles of clinical prevention	5 (11)	0 (0)	30 (68)	40 (98)	4 (3,4)	4 (4,5)	−3.88	−3.29
I am confident in implementing general prevention activities within clinical care	3 (7)	0 (0)	28 (64)	40 (98)	4 (3,4)	5 (4,5)	−4.23	−3.15
I am confident in implementing social prescription activities within clinical care	14 (32)	0 (0)	19 (43)	36 (88)	3 (2,4)	4 (4,5)	−4.34	−3.38
I have a good knowledge and understanding of Health and Wellbeing Queensland and their suite of prevention programs	22 (50)	1 (2)	12 (27)	33 (81)	2.5 (2,4)	4 (4,5)	−5.46	−3.52
<i>Behaviour change</i>								
I have a good knowledge and understanding of the influences on behaviour	1 (2)	0 (0)	36 (82)	41 (100)	4 (4, 4)	5 (4, 5)	−3.93	−3.067
I am confident in using behaviour change strategies as part of my clinical practice	6 (14)	0 (0)	24 (54)	38 (93)	4 (3,4)	4 (4, 5)	−4.77	−3.62
I am confident in my ability to offer support and guidance to clients to help them make healthy behaviour changes	4 (9)	0 (0)	31 (70)	40 (98)	4 (3,4)	5 (4, 5)	−4.55	−3.52
I am confident in my ability to offer support and guidance to clients with complex conditions to help them make healthy behaviour changes	11 (25)	0 (0)	22 (50)	38 (93)	3.5 (2.75, 4)	4 (4, 5)	−4.81	−3.41
(continued)								

Table 4. Continued

Variable	Student survey data Disagree/Strongly disagree <i>n</i> (%)		Agree/Strongly agree <i>n</i> (%)		Median (Q1, Q3)		Z score All participants Pre (<i>n</i> = 44), post (<i>n</i> = 41)		Matched (<i>n</i> = 23)	
	Pre- placement (<i>n</i> = 44)	Post- placement (<i>n</i> = 41)	Pre- placement (<i>n</i> = 44)	Post- placement (<i>n</i> = 41)	Pre- placement (<i>n</i> = 44)	Post- placement (<i>n</i> = 41)				
<i>Physical activity</i>										
I have a good knowledge and understanding of the Australian physical activity guidelines	2 (4)	0 (0)	36 (82)	41 (100)	4 (4, 5)	5 (4,5)	−2.89		−3.067	
I am confident to provide advice in line with the Australian physical activity guidelines	5 (11)	0 (0)	34 (78)	39 (95)	4 (4,4,25)	5 (4,5)	−3.37		−2.844	
I am confident in discussing behaviour change in relation to physical activity with a client	5 (11)	0 (0)	32 (73)	39 (95)	4 (3,4)	5 (4,5)	−4.27		−3.201	
I am confident in providing physical activity behaviour change support to clients	5 (11)	0 (0)	29 (66)	39 (95)	4 (3, 4)	5 (4, 5)	−4.64		−3.56	
I am confident in providing physical activity behaviour change support to clients with complex conditions	14 (32)	2 (5)	14 (32)	34 (83)	3 (2,4)	4 (4,5)	−4.91		−3.64	
					Start of placement (<i>n</i> = 44)			End of placement (<i>n</i> = 41)		
					Yes, <i>n</i> (%)	No, <i>n</i> (%)	Unsure, <i>n</i> (%)	Yes, <i>n</i> (%)	No, <i>n</i> (%)	Unsure, <i>n</i> (%)
I believe that providing behaviour change support to clients is an important responsibility of being a health professional					44 (100)	0 (0)	0 (0)	41 (100)	0 (0)	0 (0)
Providing behaviour change support to clients means they are more likely to change their health behaviours than if I don't					38 (86)	0 (0)	6 (14)	41 (100)	0 (0)	0 (0)
Note(s): Q = Quartile; Z-scores derived from Mann–Whitney U tests (all participant analyses) and Wilcoxon signed-rank tests (matched analyses). Median values are reported due to non-normal distribution of ordinal Likert-scale data										

physical activity behaviour change, and incorporate a greater variety of scenarios. They expressed preference for the discussion of more varied case studies to enhance practical understanding, with continued collaboration between health disciplines, in order to give more insight into their specific role. It was suggested that content included more items which consider or discuss patient social history, and further explanations of the Health and Wellbeing Queensland health promotion programs introduced in the training should be provided in future iterations of the training. Participants emphasised the need for cultural specificity, advising to maintain and expand on the use of culturally specific language and examples. They further highlighted the need for careful attention to wording throughout the materials, suggesting revisions to ensure greater clarity and contextual appropriateness.

Interviews

Four focus groups with participants and four one-on-one interviews with clinical educators and other key interest-holders were conducted. Demographic characteristics of all participants are in [Table 5](#).

Thematic analysis of the interview data revealed five overarching themes across students, clinical educators and key interest-holders: (1) variability in student ability and knowledge of clinical prevention impacts training module relevance; (2) perceived positive impact of training module on student clinical practice; (3) strengthened recognition of the role of interprofessional collaboration in clinical prevention; (4) design and implementation of the training module; and (5) areas for improvement and future development for the training module.

Theme 1: variability in student ability and knowledge of clinical prevention impacts training module relevance

The perceived relevance of the clinical prevention training module was influenced by differences in individual student's prior ability and knowledge of clinical prevention. Some students reported that the module introduced them to new concepts and strategies, while others found it repetitive of their existing knowledge. Clinical educators also echoed this variance,

Table 5. De-identified participant demographic information for interviews

Focus group	Participant #	Participant type	Sex	Discipline
1	S1	Student	F	Physiotherapy
	S2	Student	M	Physiotherapy
2	S3	Student	F	Physiotherapy
	S4	Student	M	Physiotherapy
	S5	Student	M	Exercise Physiology
3	S6	Student	F	Dietetics
	S7	Student	F	Physiotherapy
	S8	Student	F	Dietetics
	S9	Student	F	Dietetics
	S10	Student	F	Physiotherapy
	S11	Student	M	Dietetics
4	S12	Student	F	Physiotherapy
	S13	Student	M	Physiotherapy
	S14	Student	F	Dietetics
	S15	Student	F	Dietetics
n/a	CE1	Clinical educator	M	Exercise physiologist
n/a	CE2	Clinical educator	F	Physiotherapy
n/a	IH1	Interest-holder	M	N/A
n/a	IH2	Interest-holder	F	N/A

observing that the module's impact varied based on students' initial ability level at the beginning of their placement.

I probably didn't have much experience at all with it. The stuff that we went through in that module for the brief interventions and clinical prevention was probably the first time I'd really had a detailed explanation of it. (S3)

Students that come here and have a really good understanding of interprofessional practice and prevention can almost see it as a bit of old news . . . so it feels like a bit of a tick-boxing exercise (CE1).

Theme 2: perceived positive impact of training module on student clinical practice

Students reflected on the impact of the training module in their clinical placements, reporting that it enhanced their ability to implement clinical prevention strategies in patient interactions, highlighting improvements in patient communication, brief interventions and referral processes. Clinical educators also expressed that the module was a useful tool for reinforcing key concepts and helped to foster holistic practice.

I think after doing it, it's been a bit easier for me to identify where referrals are needed or necessary for patients (S12).

I think for them, it's quite an impactful opportunity . . . and then you can start to see sort of some of those skills coming into play a little bit later on (during placement) in terms of particularly looking more holistically in their care and more of a health behaviour focus (CE1).

Theme 3: strengthened recognition of the role of interprofessional collaboration in clinical prevention

Interprofessional collaboration emerged as a key component of the training module, with participants across all groups recognising its value in broadening students' understanding of patient care. Students acknowledged that working with peers from different disciplines enhanced their learning experience of the training module.

Especially just with other students (disciplines), kind of getting an understanding of what they've learned or what they know. (S15)

Clinical educators also emphasised the benefits of interprofessional learning embedded into the training module Part 2, particularly when students from diverse fields were present. However, some educators found that students often remained focused on their own discipline, limiting their ability to fully engage in interdisciplinary collaboration. Nevertheless, it was noted that the training module appeared most impactful when conducted when a range of professions were represented.

Obviously, it works the best when you've got the students from the different professions. (CE2)

Key interest-holders further reinforced this perspective, with one noting that the training's greatest value was in developing teamwork and interprofessional skills rather than solely focusing on clinical prevention.

I actually see the value in the training program more about building the knowledge and skills around teamwork and interprofessional practice than maybe around clinical prevention. (IH1)

Theme 4: design and implementation of the training module

Students appreciated that the timing of the training enabled immediate application and ongoing reflective practice during their placement. Key interest-holders and clinical educators highlighted issues such as scheduling conflicts and variations in placement durations. Despite these challenges, the mid-placement timing of the Part 2 module was generally well-received.

... I think it's really helpful in a way that it sort of refreshes my memory even though some things I have been taught and things like that ... especially applying this in real life in placement, it sort of refreshes it and sort of you know, reinforces it to make me you know feel more confident in delivering those. (S3)

The scheduling is challenging with students being on different placement lengths and placement days ... trying to capture everybody with the face-to-face delivery of the second part of the training has, I would imagine, been tricky. (IH1)

Some concerns were raised about the training module's design. One key interest-holder highlighted that the training aligns with their broader organisational framework, the module's diabetes-specific examples, while relevant to the current placement, may limit its broader applicability. Additionally, a need for clearer links between online content and practical application was emphasised.

Because it had been developed with the context (specific placement site) in mind, the examples provided throughout the training are very sort of diabetes-specific and context-specific. So in terms of rolling it out more broadly, you know, even the examples and scenarios provided would need to be adapted to ensure that they remain relevant or people could see what their role is in the work. (IH2)

I like the idea of a blended approach with online content and then some consolidated face-to-face delivery. But I do wonder whether students link it to their work effectively. (IH1)

Theme 5: areas for improvement and future development for the training module

Participants provided several recommendations for improving the training module. Students expressed a preference for more concise materials and the inclusion of additional real-life scenarios to better contextualise their learning.

I liked the videos with the examples and things. So just more real-life scenarios ... to get a better idea of how it is in action. (S5)

Clinical educators suggested clearer differentiation between key priorities and key considerations of the training material. Providing greater flexibility for clinical educators to adapt the module based on the specific needs and skill levels of their students was also highlighted.

... I sort of draw out that, you know, there's key priorities and there's key considerations sometimes there's a little bit of a, some people (students) think, oh, they can't see the difference in those two sort of questions. (CE2)

Potentially it's done for all of them, but maybe you keep this one (the training module) how it is, and then the next (iteration of the module), it's up to the clinical educator to decide, do we go for the easy one, or the complex one. (CE1)

There was also consideration of separating interprofessional training from clinical prevention training, with the latter potentially being delivered as a self-paced online module.

If the outcome is looking at interprofessional practice, if it's just looking at, you know, the ideas and concepts around clinical prevention, go for it, self-paced, online, you know, reflective activities baked in, all of that good stuff, which would make implementing it easier. (IH1)

Discussion

The aim of this study was to evaluate the impact of a training module for pre-professional health students in delivering clinical prevention and physical activity behaviour change. The study found that from pre- to post-placement, statistically significant improvements were

observed across all knowledge, skills and confidence components ($p < 0.001$), in both the unmatched and matched analyses. Qualitative findings suggest that the interprofessional care model employed at Logan Healthy Living appears to be an important facilitator of the training module, helping to foster collaboration across multiple health disciplines. Perspectives of students, clinical educators and key interest-holders helped identify areas for future improvement of the module. Findings underscore the positive impact of a training module on pre-professional health students' self-reported knowledge, skills and confidence, particularly in physical activity behaviour change.

Findings relating to the improvements in students' perceived confidence, skills and knowledge align with previous research highlighting the effectiveness of structured training modules in increasing both knowledge and confidence in health behaviour change (Bull and Dale, 2020; Chisholm *et al.*, 2020; Hatfield *et al.*, 2020; Lehman *et al.*, 2025). Blended learning approaches that integrate theoretical content with practical application opportunities appear to produce particularly positive outcomes, especially in terms of knowledge and confidence (Brennan *et al.*, 2017; Delente *et al.*, 2022; Donmez *et al.*, 2018; Mandic *et al.*, 2018; Matthews *et al.*, 2020; Wagenschutz *et al.*, 2011). The current study builds on this foundation by demonstrating that a clinical prevention training module, incorporating physical activity behaviour change, case-based interprofessional discussion and reflective learning may help to enhance student learning and engagement. Unlike prior studies that have treated theoretical instruction and practical experience as largely separate components (Hatfield *et al.*, 2020), the current study incorporated an embedded module within a clinical placement, helping to integrate learning with real-world application.

Both students and clinical educators recognised the relevance of the training, noting that its content aligned well with professional practice. In addition, they valued the structure, particularly the case study format, which enabled learners to apply concepts to real-world scenarios. This format is consistent with the principles of problem-based learning, which has been shown to enhance critical thinking and decision-making skills by using small group learning to address a professionally relevant problem (Nam and Kim, 2020; Trullàs *et al.*, 2022). However, students suggested that the materials could be made more concise and incorporate additional real-world scenarios, which they believed would improve the overall learning experience. Similarly, key interest-holders suggested incorporating a broader range of case studies to cover diverse patient populations and health settings, as exposure to more complex, multifaceted cases could further enhance the training module's relevance and effectiveness and potentially better prepare students for the varied clinical scenarios they may encounter in practice. Such exposure to complex cases has been shown to help health students develop higher-order clinical reasoning skills, which are crucial for effective patient care (Sultana *et al.*, 2024). Further, clinical educators suggested that the distinction between "priorities" and "considerations" in the case studies could be clarified to guide students' clinical reasoning and decision-making. This feedback highlights the need for training materials that balance comprehensive content with clear, focused delivery. Previous studies have emphasised the importance of clarity in educational materials to avoid cognitive overload, manage multiple factors and improve learning outcomes (Lehman *et al.*, 2025; Bolkan *et al.*, 2015; Serki and Bolkan, 2023; O'Cathain *et al.*, 2019). Further, student participants emphasised the need for careful attention to the language employed within the training. They recommended terminology throughout the training module should be revised to minimise the risk of inadvertently reinforcing negative attitudes or fostering adverse relationships with exercise. This finding aligns with a previous systematic review, which reported a post-training decrease in scores on the beliefs about obese persons scale, where lower scores reflect a stronger belief that individuals are solely responsible for their obesity or excess weight (Lehman *et al.*, 2025).

From a broader systems perspective, key interest-holders recognised the value of the training module but raised concerns that its focus on type 2 diabetes-specific examples could limit its applicability to other health contexts. While the module's focus on type 2 diabetes is

highly relevant for the context in which this study was conducted, expanding its scope to include other chronic conditions or public health challenges could increase its impact and versatility in training future health professionals. This aligns with the growing recognition that training modules should be adaptable and broad enough to cover a wide range of health issues (Frenk *et al.*, 2010). To enhance applicability, broadening the module beyond type 2 diabetes to include other chronic conditions that share physical activity and sedentary behaviour as modifiable risk factors would expand its potential. Practical skill-building components, such as motivational interviewing simulations or interactive decision-making scenarios, could further equip students to deliver physical activity behaviour change across various clinical contexts. For physical activity promotion in particular, such additions would also allow the module to better align with the need for health professionals to be prepared to manage a range of conditions and patient needs (Alsop *et al.*, 2023).

Both students and clinical educators acknowledged notable differences in students' readiness for clinical prevention training, largely shaped by their prior educational exposure and individual confidence levels. While some students found the module introduced new concepts and strategies, others perceived it as reinforcing previously acquired knowledge. This variation in preparedness was also observed by clinical educators. These findings are consistent with prior research, which highlights the diverse backgrounds and competencies of students beginning clinical training (Dyess *et al.*, 2019).

Clinical educators valued the reflective nature of the training module, as it encouraged students to think critically about their roles and the roles of disciplines in a healthcare team. Reflective practice is known to enhance learning and improve clinical skills by promoting deeper understanding and self-awareness (McLeod *et al.*, 2015, 2020). Further, clinical educators noted that greater flexibility in the module's delivery, particularly regarding pre-placement preparation, could allow for a more tailored approach to meet the needs of individual students. Such variability underscores the importance of adaptable training approaches that can cater to both novice learners and those with prior experience, ensuring that all students develop the foundational competencies for effective clinical prevention practice. Therefore, there is potential to enhance the training module further through the use of AI-driven adaptive learning approaches, which can adjust to individual learners and readily incorporate a wide range of case scenarios.

Strengths and limitations

Key strengths of the study include its methodological approach and practical relevance to clinical prevention education. The integration of both qualitative and quantitative data provides a comprehensive evaluation of the training module's impact, ensuring a well-rounded understanding as it involved students, clinical educator and key interest-holder perspectives. Additionally, the use of case-based learning and reflective practice reflects commonly used contemporary approaches in clinical teaching, thereby supporting the real-world applicability of the findings.

Key limitations include the absence of long-term follow up to assess the sustained impact of the training module on students and no evaluation of the impact of the training on patients. Such research would provide valuable insights into the long-term effectiveness of clinical prevention training and inform strategies for reinforcing learning beyond initial exposure. While perceived improvements in students' knowledge, skills, and confidence were observed, it remains unclear whether these gains translate into changes in clinical practice or improved patient outcomes. This is particularly pertinent as previous research has found that while initial post-training effects showed improvements, these had decreased by week 9 (Lehman *et al.*, 2025). Further, certain demographic variables, such as prior clinical experience and educational background, were not measured in the post-survey. Given the repeated cross-sectional design, only 23 participants provided matched data. This limitation restricted the analysis by preventing an assessment of how these demographic factors may have influenced changes in

knowledge, skills, and confidence. Furthermore, the small number of matched responses potentially introduces selection bias and limits the generalisability of the findings to the broader student population.

The interviews were intentionally brief to minimise disruption and accommodate the demands of students balancing clinical duties and academic requirements. Although the shorter format may have limited the depth of responses, it nevertheless yielded valuable insights into participants' immediate perceptions, attitudes and experiences. While the limitations of short interviews are acknowledged, these constraints were mitigated, where possible, through careful question design, consistent interviewing and triangulation with other data sources (i.e. open/free text questions in surveys), enhancing the overall validity of the findings.

Implications

The placement context provided several enablers to facilitate the successful implementation of the clinical prevention training module. Logan Healthy Living possesses key features that facilitate prevention-focused care, such as an established interprofessional care model, community engagement and a strong focus on chronic disease (type 2 diabetes) management. The student-infused model intentionally integrates dedicated learning time within service delivery, ensuring students engage in professional development opportunities. However, these features may not be present in all health professional placement environments suggesting that broader contextual factors should be considered to optimise training effectiveness. Research highlights that organisational culture, leadership buy-in and adequate resource allocation are essential for the sustainability and scalability of educational initiatives in health (Zorek *et al.*, 2022; van Diggele *et al.*, 2020; Figueroa *et al.*, 2019). Without these foundational elements, training programs risk being implemented in a fragmented or inconsistent manner, limiting overall impact. Future research should explore alternative delivery models, such as hybrid placements that combine traditional and non-traditional placement components and supervisory models, to improve scalability and accessibility.

An additional limitation of this study is the absence of a control group. As a result, it was not possible to isolate the specific effects of the clinical prevention training module from the broader impact of the clinical placement experience itself, nor account for potential test-retest effects associated with repeated survey administration (Scharfen *et al.*, 2018). The improvements observed in students' perceived knowledge, skills and confidence may therefore reflect a combination of exposure to the placement environment, clinical supervision and repeated measurement, rather than the training module alone. Future studies should consider controlled or comparative designs to better determine the independent contribution of the training module.

Another critical barrier to the uptake and impact of the training module was the inherent nature of clinical placements. Varying placement lengths between disciplines created inconsistencies in how students could apply and consolidate the training module, potentially undermining the continuity of their learning experience. The need for greater scheduling flexibility is a common challenge in health education, as clinical placements often involve students with differing time commitments and learning needs (Thistlethwaite *et al.*, 2013; Sellberg *et al.*, 2021). Previous research has shown that varied exposure to training content, especially when students are placed for short periods, can result in inconsistent learning outcomes (Sellberg *et al.*, 2021). Therefore, ensuring that the training module is structured to align more effectively within clinical placement is recommended to optimise its impact.

In addition to enhancing students' perceived knowledge, skills and confidence in clinical prevention, key interest-holders emphasised that the training module's broader value may lie in strengthening interprofessional skills. This perspective highlights the potential of the training module to act not only as an instrument for discipline-specific content, but also as a collective platform that fosters collaboration across professional boundaries. By embedding

interprofessional learning opportunities within clinical placements, the present study suggests that such training initiatives could help to simultaneously address gaps in clinical prevention education and prepare students for the realities of team-based healthcare practice. Therefore, future comparative research across different health contexts and chronic conditions could help determine whether interprofessional-focused training modules offer broader applicability and scalability.

Conclusion

The findings of this study highlight the positive impact of a training module in enhancing pre-professional health students' perceived knowledge, skills and confidence in delivering clinical prevention and physical activity behaviour change. The embedded training approach integrated with opportunities for practical application helped to equip students with knowledge and skills essential for addressing behaviour-related health issues. The use of case-based learning and reflective practice further reinforced students' ability to apply their learning in real-world clinical scenarios. Identified areas for improvement include refining training materials, increasing the diversity of case studies and ensuring clearer guidance on clinical decision-making.

The module's impacts suggests that this, or similar training may have broader applicability for promoting physical activity behaviour change health promotion across diverse health contexts. Future iterations should expand to additional chronic conditions and embed complex cases to enhance relevance. Research should assess whether perceived improvements translate into sustained changes in clinical practice and explore alternative delivery models. Optimising these areas will better equip future health professionals for the demands of delivering health promotion, and specifically physical activity behaviour change support, in diverse health settings.

Supplementary material

The supplementary material for this article can be found online.

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