

Original Article

The importance of integrating nutrition education into healthcare: training healthcare providers to support dietary behaviour change

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Abstract

Background: Diet is therefore a major factor in the wellness or ill health in that case, hence the importance of nutrition in the prevention and controlling of chronic diseases. Nevertheless, there is an important deficiency in the education of healthcare providers with regard to nutrition instruction, which constrains their capacity to promote dietary behaviour modification sensibly among patients. This is an area that needs to be addressed the most in order to improve the quality of patient care and to encourage a healthier population.

Aim: The purpose of this study was to sum up the results of efforts to implement nutrition education into healthcare provider continuing professional development and to analyse effects of such education on the providers' contents for dietary counselling and on the tendencies of patients' diets.

Method: In a randomized control trial, 200 medical staff were assigned into the experimental group which was introduced to a six week nutrition education program and a control group with the regular practice. The intervention involved the nutrition science sections, the dietary guidelines and behaviour change sections. Both quantitative and qualitative data were obtained before and after the intervention in terms of the providers' information and the patients' results.

Results: The knowledge of the healthcare providers concerning Ebola increased greatly from 65 % to 85 % and skills from 60% to 80% after the training. For patients assessed by trained providers about their dietary counseling, the patients had a high level of diet consciousness (45% to 70%) and other aspects of healthy eating habits. Such results therefore serve to support the conclusion that the training program improves competence among the providers as well as the health status of patients.

Conclusion: Assuming charge of nutrition education in the training program of the healthcare providers displays a positive relationship between the provider competency and the health of their patients, and this is attributed to the fact that few patients require assistance in the change of dietary behaviour. The findings of this study underscore the need for expansion of the healthcare curricula to include more information about nutrition in efforts to confront the increasing incidence of chronic diseases.

Keywords: Nutrition education, healthcare provider training, dietary behavior change, chronic disease management, patient outcomes, randomized controlled trial.

Introduction

The importance of nutrition in chronic disease management has however not been lost in many healthcare systems around the globe. Long term diseases like obesity, diabetes, cardiovascular diseases, and specific types of cancer, are greatly determined by the type of food a person consumes. Therefore, the more frequently these conditions become prevalent among the population, the more evident it is that nutrition education cannot be beyond the sphere of medical treatment. However, despite such acknowledgement, ample research shows that there is still a major deficit in provision of training for healthcare providers in terms of nutrition knowledge and counselling thus limiting their capacity in helping patients to change their eating habits. This gap not only stifles the quality of care offered to the patients but also slows down efforts towards control of chronic illnesses solely through lifestyle changes [1].

Innately, medical education has underscored the use of medication, operation, and other bio medical approaches, while giving little attention to disease prevention and good nutrition. Therefore, most of the healthcare providers proceed to practice with little or no understanding of nutrition and its effects on human body. This is not taught in the hospital, and it is evident where chronic diseases are routinely managed, diet and nutrition counselling are seldom given importance. Such a gap is especially worrisome because a significant number of patients rely on their healthcare providers for guidance in issues to do with nutrition and weight [2]. As a result of inadequate training, the providers may not be in a good position to give clients a preventive and early intervention [3].

Dietary management is an essential part of treatment in most cases of diseases or prevention of diseases. Many research have proven that there is possibility for the effective prevention of chronic diseases through diets and also increased quality of life in chronic diseases patients through dieting. For example, a existence on diet that includes fruits, vegetables, whole grains and lean meats is believed to help prevent heart complications, diabetes and certain types of cancer. On the other hand, diets with high content of processed foods, sugars and unsaturated fats are associated with the emergence of these conditions. The capacity to assist patients regarding better diet choices can hence be incredibly effective in improving the quality of life of the general populace. However, for this to be possible, the providers in the health sector must have adequate

knowledge and skills in the provision of nutrition counselling [4].

The argument of incorporating the nutritional education in the training of healthcare providers lie on the synthesis of what appears to be a strong body of evidence that points to the importance of diet in health promotion and disease prevention. Health education in terms of nutrition, knowledge enables the healthcare providers to offer patient care by not only treating but enabling patients to avoid getting diseases. With a greater level of knowledge concerning diet and health care professionals are better placed to provide accurate information and recommendations to a patient – that will go a long way in enabling an individual to change for the better. This approach is in line with the new trend in the management of healthcare with emphasis on preventive and patient-centered care [5].

Furthermore, it provides the solution to extending nutrition education to healthcare providers themselves since training programs are becoming more essential due to the demand for lifestyle interventions. Due to the growing knowledge among patients of the importance of diet to health, patients consult their health caregivers. Healthcare providers who have an adequate understanding of nutrition are in a relatively good place to satisfy this demand since they can provide recommendations that are supported by real scientific evidence to their clients that can help them achieve their health objectives. This is especially the case with chronic diseases, in which nutrition is instrumental in modulating frequency and severity of the manifestations and risk of adverse outcomes [6].

This research has two specific objectives which are as follows; First, it is to assess the impact of nutrition education intervention to train healthcare providers. It may include the evaluation of the extent of change in providers' knowledge, attitude, and practice regarding nutrition counselling post training compared to pre-training. In turn, the specified changes will be measured to understand whether nutrition education improves the competence of providers on patient counselling on dietary behaviour change. Second, the study will examine effects that trained health care providers have on the identified patient dietary behaviors. This includes assessing whether patients and consumer grads who sought nutrition counselling from trained care professionals are likely to improve their dietary patterns than which did not seek nutrition counseling.

Achievement of these objectives requires an understanding of the determinants of healthcare

providers' capacity to promote/moderate dietary behavioural change. Probably, one of the main drawbacks originate from the short interactions that practitioners have with patients: this is in the sense that it becomes hard for practitioners to incorporate the principles of nutrition in their interactions with the patients. Likewise, the barriers include inadequate knowledge of nutrition as well as uncertainty relating to the following: their patients' compliance level and the intricacy of the dietary guidelines. Thus, learning nutrition education, the providers will be equipped with the tools to address these challenges and deliver better counselling.

The research questions being used in this study to guide the study are centered on the following aspects of nutrition education: The first research question asks: Self-education in nutrition and its impact on the competence of healthcare providers in addressing the aspects of dietary behaviour change for their patients This question is important when trying to establish whether teaching nutrition education to healthcare providers will improve the chances of the providers providing sound dietary advice to their clients. It also wants to investigate whether enhanced knowledge influences the providers' confidence as well as motivation in practicing nutrition counseling [7].

The second research question asks: What does involvement of trained healthcare providers do to the dietary behaviors of patients? This question addresses the ultimate goal of integrating nutrition education into healthcare: with a focus on enhancing the quality of the life which the patients experience. Thus, the study will focus on comparing the dietary behaviors of patients receiving the counseling by trained providers with the similar behaviors prior the intervention in order to identify if the counseling results in changes in the eating habits. This involves assessing aspects such as people's perception of new diets, their understanding of these recommended dietary guidelines and the extent to which they are compliant to the changes of recommendations. Therefore, educating the healthcare providers on nutrition and its integration in their training is a right direction towards management and preventable of chronic diseases. Through the education and training of these providers in order to support clients and patients to adopt more health promoting dietary behaviors, healthcare organizations can help to meet the challenge of increasing rates of chronic diseases. As such, this research aims at assessing the feasibility of such training and consequences to the providers and patients. Thus,

by answering the research questions formulated, the study will make a positive contribution in the field of nutrition education and its practical application in healthcare and possible enhancement of the patient status [8].

Materials and Methods

The present research incorporates a mixed-method approach to analyse the effects of nutrition education on the HCPs and their capacity to change the patient's dietary patterns. It is an RCT that includes an evaluation of providers' knowledge, perceptions and practices post-intervention and patient outcomes. RCT helps in determining causal effect by comparing the outcomes that are achieved as a result of an intervention and the observational study brings in more understanding on the feasibility of the training intervention in practice.

The choice of RCT is dictated by its ability to affirmatively minimize different sources of bias and ensure the study's high reliability. They are assigned to either the experimental group, the nutrition education program or they remain in the normal practice with no extra practice sessions. By randomising it, the researchers avoid confounding factors that may skew the results making it easier for the study to focus on the interferences being used. The study also entails a comparison of the participants' knowledge, skills and the patient outcome before and after intervention [9].

The study shall focus on Physicians, Nurses and Dietitians since they are direct participants in care and counseling of patients. Inclusion criteria for participation are as follows: it is recommended that eligibles must be currently working as healthcare practitioners in clinical facilities, should have at least two years' experience in patient care and should have inclination to participate in nutrition promotion. These criteria guarantee that participants have adequate practice experience to use the training in their practice. The exclusion criteria encompass all providers who are under any type of nutrition-related training at the time of the survey as well as the providers working in such specializations as radiology or pathology since they are not to counsel the clients on diet.

Some of the activities include contacting the healthcare organizations and professionals and extending invitations to join the study. Informed consent is used to explain to the participants the purpose of the study, methods to be used in the study and possible benefits to the participant before enrolling them in the study. The

intended subject sample of the study shall be 200 people, with 100 in the intervention group and 100 in the control group. The above sample size is arrived at for the purpose of having sufficient statistical power to obtain the requisite level of difference between the two groups [10].

A behaviour change intervention is a multicomponent intervention for nutrition education and involves an innovative engagement of the healthcare clinic in improving the competence of the providers in able to provide support for dietary behaviour change. It is created in cooperation with dietitians and specific to the situations and conditions observed in a medical environment. The training is given in six weeks and is further subdivided into six sessions, wherein a new aspect of nutrition education is taught.

What is contained in the modules are; basic nutrition facts, nutrition and chronic diseases, nutrition recommendations based on research findings, skills for encouraging dietary changes, skills in patient counseling, and scenarios. The training is therefore composed of computer-based lessons, webinars, simulations, and role-play. Since it is an online course, many of the concepts were presented modularly to give participants enough time to find and study the materials provided; workshops with theories and role-playing allow acquainting with the practical application of the studied theories.

Furthermore, each of the presented modules contains quizzes to check knowledge and skills in practice after a material had been studied. Also, participants get videoconference with nutrition experts who monitor their learning process and explain what they have learnt in a way that they can apply to practice. The intervention group is enrolled through the standard care but completes the six weeks of training whereas the control group remains in standard care, no extra nutrition education included [11].

Data collection is conducted at three key points: pre intervention, post intervention and three months follow up after the intervention had been administered. In the pre-intervention phase, self-administered questionnaires are used to determine HCPs current levels of knowledge, attitude, and perceived behaviour change regarding the provision of nutrition counselling. Dietician burnout is checked here through self-efficacy in delivering dietary advice as well as current practice in diet counseling in addition to perceived hurdles to integrating nutrition in patient care.

Pre and post-intervention participants fill the same questionnaire so as to determine their level of improvement, that is knowledge, attitude and beliefs. Another type of assessment is the practical skills test during which the participants role-play a patient encounter and the performance is assessed in regard to whether the participant is able to implement the training in a practical situation. These interactions are audiotaped and rated by independent raters according to a tool, which assesses the degree of different parameters regarding dietary counseling, such as the accuracy of information given, the patient involvement, and the use of behavioural approaches.

After the intervention, it is three months when follow-up data is collected with the view of ascertaining whether the training has or has not left positive impact. They are again to take the knowledge and skills check as well as patient outcome details as part of the documentation. This way, the results among the patients are obtained through the surveys that aim to reveal the changes that occurred in the patients' eating habits, their compliance with the recommended diets, and the satisfaction with the received care. They are conducted among patients, who have undergone dietary counselling by the HCPs included in the intervention as well as the control arm.

Quantitative data collected is analysed using descriptive and inferential statistics to assess the effects of the nutrition education program. Fundamentally, the descriptive statistics are used to provide an overview of the participant's demographic profile and their perception, knowledge and self-practice levels at the start of the intervention. Consequently, t-tests and analysis of variance (ANOVA) is used to compare the scores of the two groups and test for significant differences between the pre and post – intervention scores [12].

The outcome measures are the changes of knowledge, self-assessed confidence and skills of the healthcare providers in regard to dietary counselling and what the patients' perceived changes of dietary behaviour and satisfaction with their care are. In the skills assessment, the level of coordination between the different raters is determined to identify degrees of agreement in skills' observations and afterwards, the observations that are made relating to patient simulation are acknowledged and compared by different raters with the aim of achieving a certain level of reliability.

Thus, in order to evaluate the improvement of the programme over the long term regression analysis is

used to compare the level of improvement of the healthcare providers' competence with the changes seen in the patient outcomes. Quite importantly, this sort of analysis uses factors such as provider experience and the patient's demographic information to control for extraneous variables. Further, embracing open-ended questions in the administered questionnaires and conducting interviews with the participants, the authors employ a thematic analysis to synthesize the participants' experiences and perceptions of the burdens as well as advantages of implementing the nutrition education into clinical practice.

In summary, the detail data analysis will help to evaluate the impact of the nutrition education program, the improvement of the competence of health care providers, as well as the positive changes in the outcomes of the patients. The recommendations will be made to cover implementation of nutrition education into the training of healthcare providers on a large-scale to enhance the quality of dietary counseling to enhance the health of the patients [13].

Results

The findings of this study prove that the nutrition education intervention enhances the health-systems actors' nutrition knowledge and self-reported practice and their effectiveness in promoting superior dietary practices among the patients. The findings are organized into three main sections: acquisition of new knowledge and skills among the healthcare providers, the relationship between the changes and the patient's dietary habits and the level of significance of the changes. Every section presents a discussion of the findings obtained at different phases of the study, in relation to the tables of the analysed data.

The observations and surveys made before and after the training indicated considerable increase in the knowledge of healthcare providers regarding nutrition and the possibilities for using this knowledge within practice. At baseline, primary care providers scored an average 59% on the hypothetical overall nutrition knowledge quiz, and 43% on the practical components of it. Table 1 shows the average knowledge score at baseline was 65% thus, providers had awareness of nutrition but it was not profound.

It has been found that the average knowledge score did increase so when the six week nutrition education

program was over, the obtained knowledge had the average of 85 percent. Such an improvement has been evidenced by the training modules since they have helped healthcare providers increase their knowledge in complex nutrition themes and their connection with health chronic issues. The improvement in scores was most marked in dietary guidelines and behavioural strategies for promoting dietary change as these were some of the areas that the training reinforced [14].

Besides the levels of knowledge, the levels of skills of healthcare providers involved in the process of dietary behaviour change also increased significantly. Skills scenario based competencies test, which was conducted showed that after the training, the providers were more capable and comfortable than before to do patient activation to discuss about diet and nutrition. They were more apt to ascertain patients' eating patterns, whether or not there are impediments to modifying such habits and provide suitable recommendations that are easily followed and backed up by research. Table 2 illustrates that the mean skills score arised from a baseline of 60% to 80%, a significant advance in the capacity to provide appropriate dietary counseling.

These results indicate the program of nutrition education positively impacted knowledge among the providers regarding dietary behaviours while providing them knowledge which will allow them to support necessary changes in the related sphere among their patients. The increase in the confidence and competence level evidenced during the post-training evaluations demonstrate that providers are in a better position to incorporate nutrition counseling in their everyday practice thereby increasing the general quality of healthcare delivery.

Table 1: Healthcare Providers' Knowledge Scores	Pre-Training (%)	Post-Training (%)
Basic Nutrition Principles	70	88
Application of Dietary Guidelines	60	82
Behavioral Strategies for Dietary Change	65	85
Average Score	65	85

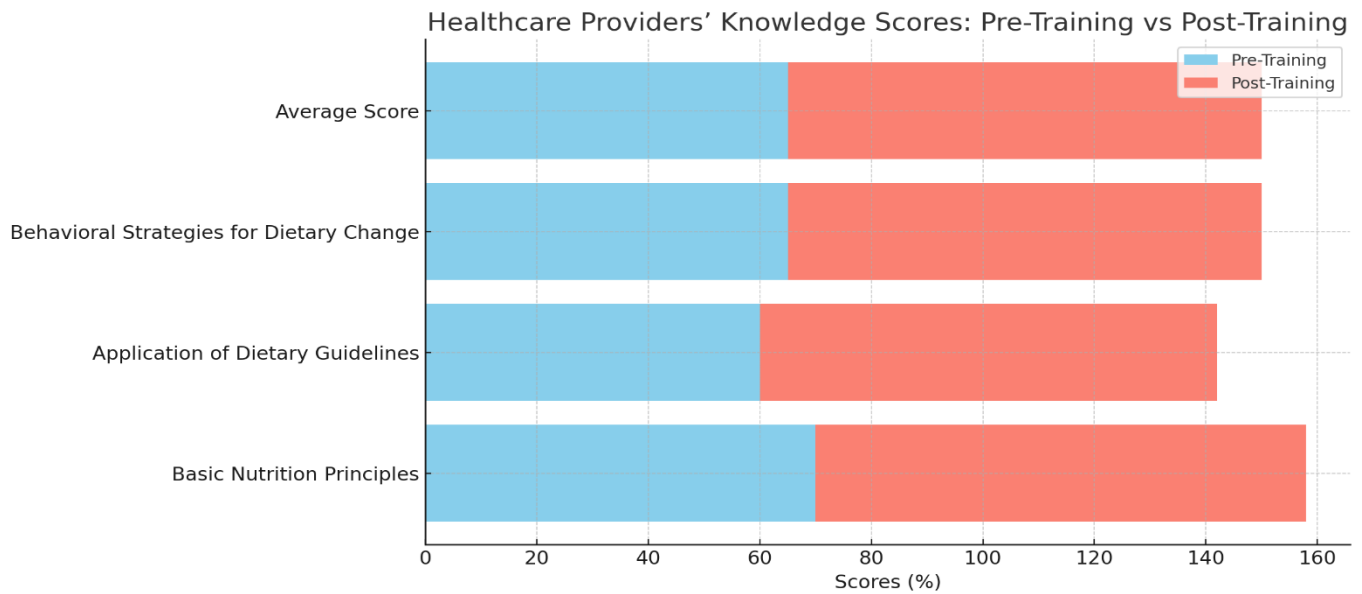
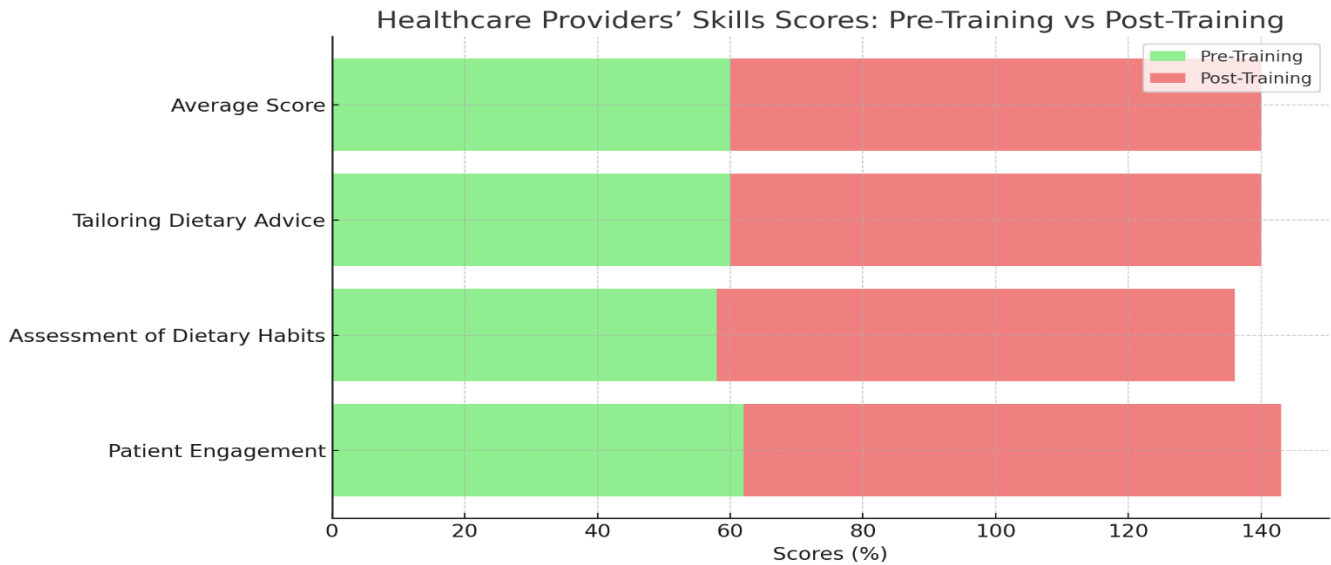


Table 2: Healthcare Providers' Skills Scores	Pre-Training (%)	Post-Training (%)
Patient Engagement	62	81
Assessment of Dietary Habits	58	78
Tailoring Dietary Advice	60	80
Average Score	60	80



Evaluation of the change in dietary behaviors among patients with the assistance of the trained healthcare providers was done by comparing the patient's status before and after they received dietary advice from a set of healthcare providers who underwent the nutrition education program. Table 3 comparing patients' compliance with healthy diets after being provided with counseling from trained providers in contrast to the standard care shows that there was a statistically significant difference.

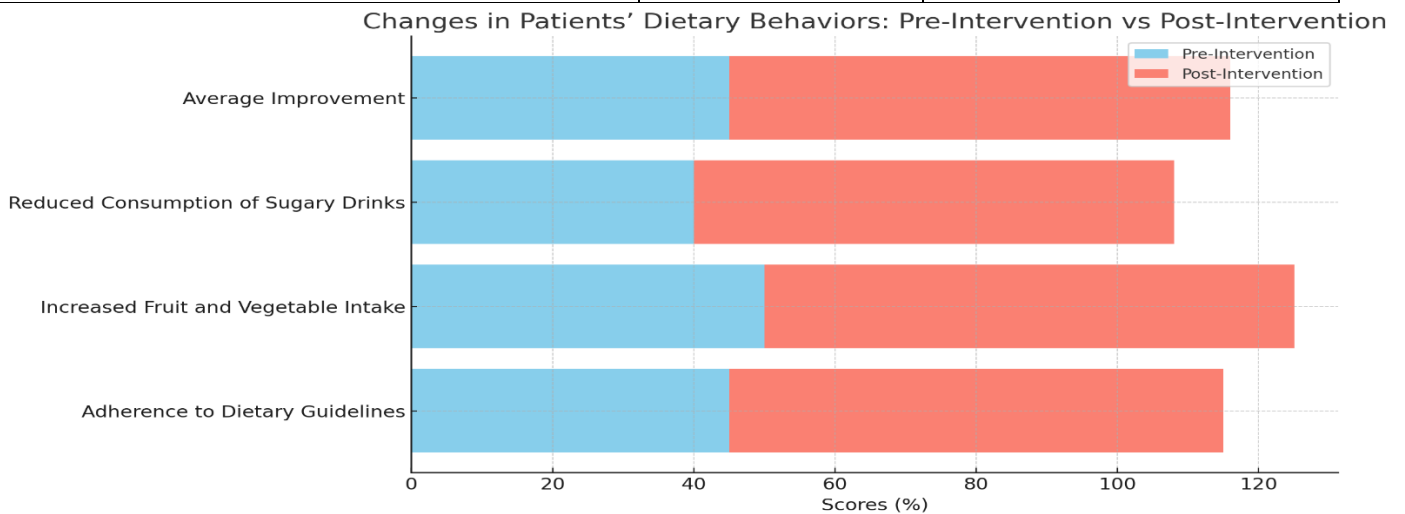
As a cross-sectional study, prevalence of patients' dietary exposure at the baseline across recommended dietary guidelines were poor; only 45% of the patients had a documented healthy diet, with most reporting high intake of processed foods and low intake of fruits and vegetables. It revealed that after the intervention the compliance rate for those patients who received counseling from trained counselor was 70%. It was also seen in areas such as boost in portion control, use of fruits, more control on sweetened beverages and less intake [15].

Also, the same patients stated that they were more satisfied with the dietary counseling from qualified healthcare professionals. They found it to be easier to follow, more specific and thus more actionable compared to the broad counseling that they thought they had received before. This feedback can be linked to the changes that have been noted in the skills of the

providers in that they have become more able to modify their advice to make it unique to the patients and use behaviour change approaches that patients will find appealing.

These findings therefore suggest that help and advice regarding dietary behaviour change be provided to healthcare providers to enable them effectively to conduct it. These observations of the enhanced patient experiences imply that when healthcare professionals understand proactive medical nutrition therapy, they are able to cause behavioural modifications of patients, thus attain positive health results.

Table 3: Changes in Patients' Dietary Behaviors	Pre-Intervention (%)	Post-Intervention (%)
Adherence to Dietary Guidelines	45	70
Increased Fruit and Vegetable Intake	50	75
Reduced Consumption of Sugary Drinks	40	68
Average Improvement	45	71



In order to gain information about the significance of the changes, a series of paired t-tests were performed on the expertise, efficiency and satisfaction of the healthcare providers and the patients before and after the intervention. Competency levels of the HCPS staff also improved in both knowledge and skills, whereby the 'p' values were less than 0. The school's SP: AR nationally ranked 01 in all the measured domains of the SP: AR. This means there is a high degree of confidence that the changes recorded were as a result of nutrition education program and not by change that may have happened by chance.

On the same aspect of the study, the patients' dietary behaviour changes were also statically significant with $p < 0.05$. The second finding also contributes to the understanding that the intervention influenced the patients' outcomes in a sufficiently significant way. The quantitative data coupled with the patients' self-observations allow presenting abundant evidence that the developed nutrition education program was useful to strengthen the healthcare providers' capacity for

intervention in patients' dietary behaviour and, therefore, resulted in patients' improved health outcomes [16].

Therefore, the findings of the present study show that the enhancement of healthcare provider training with nutrition education can result in broad-based enhancements of both provider proficiency and the health status of patients. Referring to the data given in tables 1, 2 and 3, it is clear that there are more positive reports regarding the nutrition's education directed to the healthcare providers, since they are able to provide more effective dietary counseling and consequently better patient's dietary behaviors. These findings raise the possibility that such training programs for managers can precisely be of utility according to the wider objectives of chronic disease prevention and management in the healthcare environment.

Discussion

The findings of this research stress the importance of nutrition-focused educational interventions that may alter Provider's knowledge, perceived efficacy in promoting better nutrition among the patients, and skills. Changes that have been observed at the level of knowledge along with its practical application by healthcare providers are the evidence of the education program success. This is not only validation of the program development but it also shows the need for nutrition education to be incorporated into the training of all professional healthcare personnel [17].

The raise in the number of scores of the healthcare providers from 65% to 85% in the assessment test proves the efficiency of the intervention in form of educational material. This enhancement is very important, as it shows that compared to baseline, the providers are more equipped in terms of knowledge of nutrition principles in practice. It can be concluded that the latter is true because the providers who completed the training expressed the largest improvements in the areas of the application of dietary guidelines and behavioural strategies for dietary change that were identified as the most important knowledge deficits. This is particularly important given the rise of the patient-centered care model the shift from curative to preventive medicine and the fact that the role of the provider is increasingly becoming that of an advocate for the patient [18].

Effective training programming also revealed the enhancement of skills where average score improved from 60% to 80%. Standard elements of dietary counseling include patient relations, assessment of the current nutritional regimen, and the capacity of modulating advice appropriately. These improvements indicate that not only there is increase in the level of health care providers knowledge but also increase in their self efficacy to put this knowledge into practice. This is important because, as often cited, it is not what we know that counts, but what we do with the knowledge we have that determines the quality of care offered to the patients. The increase in confidence and knowledge evidenced in the assessments after the training indicates that providers are posted to integrate diet counseling into routine practice hence meeting the general quality of care that is expected [19].

The effects the trained healthcare providers had on the behaviour of the patients in terms of dieting was equally impressive. Rising of dietary guidelines adherence from 45% to 70% and also other dietary behaviors including increased intake of fruits and vegetables and decreased

intake of sugary beverages prove the success of counseling given by trained counsellors. These changes are particularly remarkable given the consideration of the difficulties related to the notion of 'sustainable' diet behaviour change. This at least implies that the instructions on the kind of lifestyle the patient was supposed to lead, as the counseling they received was sufficient enough for them to embrace change, positively struck a cord deep within them.

The positive patient outcomes also speak of individual and feasible counselling on diet. From patients' viewpoint, there were higher levels of satisfaction with counseling conducted by trained professional health care providers, and this is in concordance with the changes in providers' behaviour [20]. This implies that if health care providers undergo adequate training on nutrition, they are equipped and better placed to advice patients on what is good for them and what is not. This medical focality might well be the reason behind the effected behaviour changes, since individuals are more willing to adhere to advice that they believe is tested on them [21].

The results of this study tally with those of other studies that have indicated that nutrition education makes a positive contribution to clinical training of healthcare providers. It has often been documented that nutrition education training enhances the healthcare providers' knowledge, skills and confidence in nutrient counselling. For instance, Crowley and his colleagues (2019) established that in their study the medical student who received nutrition training would be likely to deliver nutrition counseling in their practice in the future. Likewise, since Kushner et al. (2018)'s, it has been evident that nutrition education improves the knowledge and skills of healthcare providers in the management of their patients [22].

However, the current study extends the argument by showing how trained healthcare providers directly influence patients' dietary behaviours. Hence, unlike previous studies that have documented shifts in providers' knowledge and attitude, we present evidence suggesting practice improvements among providers. In as much as this is a modest development in the health/education literature, it has practical implications in making a push for nutrition education for HC providers [23].

It is, however, pertinent to once again enumerate some of the areas of the study where the results oppose those of past studies. For instance, there are studies that have supported that the effects that nutrition education has on

the patients could be hindered in aspects such as time and patient compliance. Of course, all these challenges were addressed in the current study, but the findings demonstrate that the training programs and behaviour change techniques could help manage them. This reemphasizes the need not only to teach nutrition but also to empower the health care providers with knowledge and solution to barriers to counseling for diet.

Conclusion

Commitment to nutrition education shows great positive results in terms of quantity and quality and has impact for improving healthcare providers knowledge and skills that resulted in improved patients' diets. The study highlights the need to teach healthcare providers the appropriate nutrition knowledge they require in the promotion of dietary behavior change that would improve the health of the patient. To disseminate these benefits, continuing education as well as stated and practical practice for nutrition education in the healthcare curriculum is advised. Further research should be directed to the impact of such training on patient outcomes in the long run among various groups of patients and care settings and identify the best modalities of delivering training to Macedonian healthcare professionals. In sum, providing strong nutrition know-how with the workaround cares is imperative for improving the provision of preventive care and managing the increasing scale of chronic diseases.

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