Healthcare Professional’s Utilization of Physical Exercise as a Strategy to Prevent NCDs in Ethiopian Public Sector Hospitals

Melkamu Dugassa Kassa* and Jeanne Grace
Discipline of Bio-Kinetics Exercise and Leisure Sciences, College of Health Science, University of Kwazulu-Natal, Durban, South Africa

Abstract

**Background:** Despite the recognized benefits of physical exercise, including a reduction of health risk factor indicators, illness and death related to Non-Communicable Diseases (NCDs) (cardiovascular disease, diabetes, hypertension, cancer), the extent of its recognition and use as a prevention strategy by healthcare professionals working in Ethiopian referral hospitals is unknown.

**Objective:** This study explored healthcare professionals’ use of Physical exercise as a non-communicable disease Prevention Strategies in the Ethiopian public sector Healthcare System.

**Methods:** A cross-sectional study was conducted among (N=312) health care professionals (nurses, physicians and medical managers) in 13 Ethiopian referral hospitals.

**Results:** The results indicated that three quarters (78%) of healthcare professionals working in Ethiopian hospitals are not using physical exercise as a strategy to prevent NCDs. Increased specialization (AOR=20.203, p<0.001), many service years (AOR=0.041, p=0.014), young age (AOR=19.871, p<0.001), and being men (AOR=0.269, p<0.001) were predictors of using physical exercise as a strategy for NCDs prevention.

**Conclusion:** Healthcare professionals’ utilization of physical exercise as a strategy for NCDs prevention was inadequate in Ethiopia. Given the increasing burden of NCD disease in Ethiopia, training nurses, physicians and medical managers to use physical exercise as an NCD prevention strategy is essential at undergraduate level for as well as through specialized courses once they are qualified.

**Keywords:** Age; Sex; Public hospitals; Physical exercise; Service year; Specialization

**Introduction**

Non-Communicable Diseases (NCDs), such as cardiovascular disease, diabetes, hypertension, obesity, cancer and mental are a major public health challenges, constituting 38 million deaths annually, this being 68% of global mortality each year [1,2]. The majority of NCDs share common risk factors, such as tobacco use, alcohol intake, poor diet and inadequate physical exercise, and affect many lives economies. Many NCD can be prevented by addressing the behavioral risk factors [3]. Specifically through physical exercise, which, despite its numerous health benefits as a tool to prevent NCDs, remains inadequately used at a global level [4]. NCDs affect many nations, including low-income developing countries such as Ethiopia, and accounts for 30% of its annual deaths [5,6].

The benefits of physical exercise have been recognized by many researchers, and include enhancing muscle tone and strength, the cardio-respiratory system, mental alertness, and a decrease of body fat [7,8]. Moreover, physical exercise plays a substantial role in preventing and reducing the symptoms, risks, morbidity and mortality associated with NCDs [9]. Research has demonstrated that the lack of physical exercise in early and middle age results in health problems later on when aged [9]. However, despite this, the utilization of physical exercise as a strategy for NCD prevention in the Ethiopian, and many other healthcare system, remains unexplored. The Ethiopian healthcare system focuses on disease and illness treatment instead of prevention, while the prevalence of NCDs continuing to increase.

According to Hoeger and Hoeger [10], physical exercise is described as “any type of physical activity that requires planned, structured, and repetitive bodily movement designed to improve and maintain the health and wellness of individuals.” Physical exercise can be performed for multiple purposes, including to preserve the body, prevent disease, reduce stress, build muscle, boost mental and physical health, and facilitate physical growth, development and motor skills, all of which contribute to a healthy lifestyle [11]. Studies show that engaging in regular physical exercise enhances the immune system and enable the body to resist diseases of lifestyle, such as cardiovascular disease, diabetes, hypertension and obesity [12,13]. Evidence indicates that these conditions are increasing the global health burden [14], which can be addressed by utilizing physical exercise as a strategy to prevent NCDs [15]. Currently, physical exercise is recognized by healthcare professionals as the “miracle” medicine, considering the all-encompassing range of benefits it can provide for health [16,17]. To underline the health benefits of physical exercise [18], Butler noted that “If exercise could be packed in a pill, it would be the single most widely prescribed and beneficial medicine in the nation.

In countries with lifestyle and nutritional transition and challenges, such as Ethiopia, the prevalence of NCDs is often high, given the increasingly sedentary lifestyle, with their related social, economic and health burdens. Despite the acknowledged health benefits of physical exercise on NCDs, many individuals do not participate in

*Corresponding author: Melkamu Dugassa Kassa, Discipline of Bio-Kinetics Exercise and Leisure Sciences, College of Health Science, University of Kwazulu-Natal, Durban, South Africa, Tel: +0312608833; E-mail: kassamd2015@gmail.com

Received December 12, 2017; Accepted January 01, 2018; Published January 07, 2018

Citation: Kassa MD, Grace J (2018) Healthcare Professional’s Utilization of Physical Exercise as a Strategy to Prevent NCDs in Ethiopian Public Sector Hospitals. J Health Educ Res Dev 6: 243. doi: 10.4172/2380-5439.1000243

Copyright: © 2018 Kassa MD, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
such activities. In addition, despite the important role physical exercise plays in preventing and reducing NCD related complications, the extent to which healthcare professionals' use it as a strategy for disease prevention is unknown [19]. In this context, the lack of physical exercise has reached epidemic levels, and is one of the top four NCDs risk factors in the world, causing morbidity and mortality in global populations [20]. Evidence shows that nearly 60% of the population worldwide is less likely to meet the suggested level of regular physical exercise of 150 minutes of moderate intensity, or 75 minutes of vigorous intensity physical exercise per week [14,21]. A lack of physical exercise has been shown to be associated with 6% of coronary heart disease, 7% of type 2 diabetes, 10% of colon cancer, 10% of breast cancer, 9% of premature mortality and 6 million global deaths annually. In this regard, researchers indicate that increased activity of 10% to 25%, will prevent 1.3 million premature annual deaths that are associated with lack of physical exercise [12].

A recent study showed that low levels of physical exercise are of specific concern for countries that are experiencing lifestyle changes associated with growing rates of urbanization [22]. Globally, a range of investigations and initiatives have been established and implemented to overcome the low levels of physical exercise [23,24]. For example, [25] the Exercise is Medicine global health initiative [26], which considers exercise to be a medicine that physicians need to prescribed, as in the Bangkok declaration on physical activity for global health and sustainable development [23]. Learning a lesson from the various global initiatives, 40% of healthcare professionals in Brazil developed a physical exercise program and communicated it to their patients [27,28]. Studies indicated that healthcare professionals are very aware of the health benefits of physical exercise, and are appropriately placed to communicate, counsel, and utilize it to treat their patients [29]. Moreover, it is clear that healthcare professionals have a professional responsibility to advise, prescribe and develop physical exercise programs, and to provide them to patients to enable them to change their levels of activity [30,31]. Research has suggested that healthcare professionals are the key actors in the healthcare system to promote cost-effective diseases preventive strategies, such as physical exercise and a healthy lifestyle, to address the escalating illnesses linked with physical inactivity [32,33]. There is evidence that doctors who communicated and counselled their patients about healthy lifestyles and physical exercise had a positive effect on their patients' involvement in a regular program for health improvements [31]. Despite this evidence, policies and strategies to promote physical exercise amongst the public, and to utilize it as a preventative strategy in the healthcare system, are lacking in developing countries [4]. Studies are also lacking on the involvement of healthcare professionals' in promoting and utilizing physical exercise as a strategy for NCDs prevention in the Ethiopian healthcare system. The present study therefore aimed to investigate healthcare professionals' utilization of physical exercise as a strategy to prevent NCDs in Ethiopian public sector hospitals.

Materials and Methods

Study setting

A cross-sectional study was conducted at 13 purposively selected Ethiopia hospitals due to their providing tertiary healthcare, particularly on NCDs, namely: Addama, Assossa, Black Lion, Dagimawi Minlik, Debre Berhan, Bishoftu, Felege Hiwot, Hawassa Adare, Jima University, Nekemte, Pawie, Shashamane, and the University of Gondar. All facilities are located in urban areas, with the medical staff applying for posts based on their preferred location.

Participants

For the study, 312 participants were selected from the 13 hospitals, these being 99 physicians who were purposively selected and 213 proportionately and randomly selected nurses, 12 of whom were health team managers. Participants were considered for inclusion if they had three years and more work experience in a public sector hospital treating NCDs related conditions. The purpose of the study was explained to participants, and informed consent were required and signed before they could participate.

Data collection procedures

A self-administered questionnaire survey was conducted after being piloted to ensure validity and reliability. The validity of the questionnaires was also checked by a biostatistician before commencing the data collection. For the questionnaire items, the significance threshold was set at p<0.05, and a Cronbach's Alpha 0.956 was obtained. Healthcare professionals' who provided consent to participate in the study and fulfilled the inclusion criteria completed the questionnaire, which consisted of two sections. The first section obtained information on the participants' demographic characteristics (age, gender, specialization, service years and marital status). The second consisted of 12 questions, and was designed to establish healthcare professionals' utilization of physical exercise as a strategy for NCDs prevention is using a 2-point Likert scale consisting of "Yes" and "No", with all questions starting with an affirmative statement i.e., "I inform", "I discuss" or "I advise". A trained fieldworker distributed the questionnaires to the selected healthcare professionals at an appointed time at each of the 13 hospitals and waited while they were completed.

Data analysis

The collected data were cleaned, coded and analyzed using the Statistical Package for Social Science (SPSS) version 24. Descriptive statistical analysis was performed to determine the socio-demographic characteristics (Section 1), as well as the responses per category to the 12 questions in Section 2 of the questionnaire. The responses to each of the 12 questions were then summed and presented as a percentage, with a binomial test being used to determine whether a significant number (p-value) of respondents replied "Yes". Of the 12 items, those participants who responded "Yes" to 7 or more for all 12 questions were coded as 1 and considered to use physical exercise as a strategy to prevent NCDs. Those who replied "Yes" to using physical exercise as a NCDs preventive strategy but scored below 7 were coded 0 and considered to not use physical exercise as a strategy for NCDs prevention. Logistic regression analysis was used to determine the socio-demographic variables of healthcare professionals' associated with the use of physical exercise as a strategy for NCDs prevention (Tables 1-3). The scores were statistically analyzed to establish the Adjusted Odds Ratio (AOR) and the reference category are set based on SPSS default that is always the last category. Omnibus Tests of Model Coefficients were used to test the goodness of model fitness and ensure statistical significance (Table 4). All tests were conducted to show a 95% confidence interval and to recognize a 5% level of significance.
Results

The participants socio-demographic characteristics (Table 1) indicate a greater number of women respondents (n=195, 62.5%), with the majority being less than the ages 33 years (59.6%). Married respondents accounted for 81.7%, and more than half (67.0%) were general nurses. Specialist physicians accounted for 5.4%, with 23.1% being general physicians. The majority of the respondents had 3-8 service years (57.4%), with only a few (4.2%) having 15-20 years of service.

Table 2 presented the response to the 12 questions in descending order of those responding “yes”, and shows (questions 1-5) that over 30% of the participants reported discussing physical exercises, their benefits and difficulties with their patients. However, few health practitioners engaged with their patients about the frequency, duration, intensity and type of exercises they should engage in (questions 6-9). Even fewer (questions 10-12) develop and provide written information to their patients to make them more physically active. When each respondents scores for the 12 questions were average by their Yes/No reply, those who had an average score of seven and above for using physical exercise as a strategy for NCDs prevention accounted for 28% of healthcare professionals.

A logistic regression analysis was conducted to predict health facilities healthcare professionals’ use of physical exercise as a strategy to prevent NCDs, with sex, age, service years and specialization being found to be significant predictors in Ethiopian hospitals (Table 3). The odds ratio indicated that female healthcare professionals were less likely to use physical exercise as a strategy than male healthcare workers (AOR: 0.269, 95% CI: 0.130-0.556, p<0.001). Those under the age of 33 regarded physical exercise as a strategy for NCDs prevention approximately 20 times more than those over 34 years old (AOR: 19.871, 95% CI: 4.531-87.146, p<0.001). Health care workers with 3-8 years of service (AOR: 0.041, 95% CI: 0.009-0.796, p=0.031) were less likely to utilize physical exercise as a strategy to prevent NCDs than those with ≥ 15 years. The odds of using physical exercise as a strategy for specialist physicians was higher than nurses (AOR: 208.890, 95% CI: 32.860-1327.914, p<0.001). General physicians were also more likely to utilize physical exercise than nurses (AOR: 20.203, 95% CI: 7.594-53.744, p<0.001).

The Omnibus Tests of Model Coefficients used to test goodness of model (Table 4) was statistically significant, indicating that the predictors as a set reliably distinguished the users and the non-users of physical exercise as a strategy (chi-square=147.100 with df=19, p<0.001).
attributed to the variation in the healthcare policy of the two countries, with physical exercise counselling [27,28]. The difference could be physicians, nurses and community healthcare workers provide patients exercise is included and used as a NCDs preventive strategy [41].
during a clinical visit [40], and in Kenya and South Africa, physical exercise counselling to their patients [39]. Unlike Ethiopia, healthcare professionals were physically active and able to impart physical two healthcare centres of Saudi Arabia showed that primary healthcare them from using physical exercise as a strategy to prevent NCDs in the sedentary lifestyle of Ethiopian healthcare professionals may prevent studies, they showed improved skills, knowledge, and confidence in physical exercise training was included in the curriculum of medical how to utilize it in healthcare situations. Studies reflect that where possible reason could be attributed to lack of knowledge, confidence, skill, time and interest to counsel their patients about physical exercise to prevent NCDs, as indicated by various studies [34,35]. Another possible reason could be the absence of long- and short-term training for health care professionals on the benefits of physical exercise and how to utilize it in healthcare situations. The findings, that female healthcare professional are less likely than males to recommend physical exercise, are consistent with a study in Dire Dawa [38]. The gender difference of using physical exercise as a strategy to prevent NCDs could be attributed to their lifestyles, with women being less physically active than men [30,43]. Another reason could be attributed to differences in attitudes between men and women regarding physical exercise. A systematic review indicated that healthcare professionals with positive attitudes towards physical exercise were more likely to counsel their patients about its use [22].

The results of our study indicate that healthcare professionals under the age of 33 utilize physical exercise as a strategy for NCDs prevention 19 times more than those over 34 years. The age variation could be a result of the activity levels of healthcare providers as a function of age, with a decrease with increasing age as indicated by other researchers [44]. The results of our study revealed that specialist physicians use physical exercise as a strategy to treat NCDs more than nurses, with general physicians regarded physical exercise as a strategy to treat NCDs more than nurses. The finding of greater recommendations of exercises by specialist and general physicians than nurses supports a study in Brazil [45]. Similar results, the results of our study are consistent with research in Brazil that reported physicians being more likely to utilize physical exercise and counsel their patients compared to nurses [45]. Health professionals with more than 15 years’ service were most likely to use physical exercise as NCDs preventive strategy. This could be associated with engagement with other health care professionals over time and exposure to varying opinions, which enables them to improve their knowledge and understanding of how to address various conditions.

Discussion

To our knowledge, this study is the first to explore healthcare professionals’ utilization of physical exercise as a strategy to prevent NCDs in Ethiopia. In this study 312 healthcare professionals’ selected proportionately and randomly from 13 referral hospitals in Ethiopia were participated. A greater number of respondents were women (62.5%), with the majority being less than the ages 33 years (59.6%). More than half (67.0%) were general nurses. Specialist physicians accounted for 5.4%, with 23.1% being general physicians. The majority of the respondents had 3-8 service years (57.4%), with only a few (4.2%) having 15-20 years of service. Based on the responses to the 12 questions, the majority (78%) of healthcare professionals in Ethiopian hospitals do not utilize physical exercise as a strategy to prevent NCDs. The reason could be the absence of knowledge, confidence, skill, time and interest to counsel their patients about physical exercise to prevent NCDs, as indicated by various studies [34,35]. Another possible reason could be lack of knowledge, confidence, skill, time and interest to counsel their patients about physical exercise to prevent NCDs. The findings, that female healthcare professional are less likely than males to recommend physical exercise, are consistent with a study in Dire Dawa [38]. The gender difference of using physical exercise as a strategy to prevent NCDs could be attributed to their lifestyles, with women being less physically active than men [30,43]. Another reason could be attributed to differences in attitudes between men and women regarding physical exercise. A systematic review indicated that healthcare professionals with positive attitudes towards physical exercise were more likely to counsel their patients about its use [22].

The results of our study indicate that healthcare professionals under the age of 33 utilize physical exercise as a strategy for NCDs prevention 19 times more than those over 34 years. The age variation could be a result of the activity levels of healthcare providers as a function of age, with a decrease with increasing age as indicated by other researchers [44]. The results of our study revealed that specialist physicians use physical exercise as a strategy to treat NCDs more than nurses, with general physicians regarded physical exercise as a strategy to treat NCDs more than nurses. The finding of greater recommendations of exercises by specialist and general physicians than nurses supports a study in Brazil [45]. Similarly, the results of our study are consistent with research in Brazil that reported physicians being more likely to utilize physical exercise and counsel their patients compared to nurses [45]. Health professionals with more than 15 years’ service were most likely to use physical exercise as NCDs preventive strategy. This could be associated with engagement with other health care professionals over time and exposure to varying opinions, which enables them to improve their knowledge and understanding of how to address various conditions.

| Step 1 | Model | Chi-square | df | Sig. |
|--------|-------|------------|----|------|
| 1      |       | 147.1      | 19 | 0    |

Table 4: Omnibus Tests of Model Coefficients.

| Gender: | Female | 195 | -1.315 | 0.269 | 0.000** | 0.13 | 0.556 |
|---------|--------|-----|--------|-------|---------|------|-------|
| Male    | 117    |     |        | 1     |         |      |       |
| Age ≤ 33| 186    |     | 2.989  | 19.871| 0.000** | 4.531| 87.146|
| ≥ 34    | 126    |     |        | 1     |         |      |       |
| Service years: | | | | | | | |
| 3-8     | 179    |     | -3.193 | 0.041 | 0.014*  | 0.003| 0.521 |
| 9-14    | 120    |     | -2.463 | 0.085 | 0.031*  | 0.009| 0.796 |
| ≥ 15    | 13     |     |        | 1     |         |      |       |

| Specialization: | | | | | | | |
| Specialist physician | 17 | 5.342 | 208.89 | 0.000** | 32.86 | 1327.91 | |
| General physician    | 72 | 3.006 | 20.203 | 0.000** | 7.594 | 53.744 | |
| Health team manager  | 12 | -18.54 | 0 | 0.999 | 0 | 0 | |
| Nurse               | 211 |     |        | 1     |         |      |       |

* Odds Ratio is significant at α=0.05; ** Odds Ratio is significant at α=0.01, β=coefficient of the odds ratio, AOR (Adjusted Odds Ratio), C.I. (Confidence Interval).
Conclusion

This research indicated that the use of physical exercise by healthcare professionals is inadequate in the Ethiopian healthcare system. The study revealed that age, gender, specialization and service years are predictors of using physical exercise as a strategy to prevent NCDs in Ethiopia among healthcare professionals. Its use as a prevention strategy for NCDs patients’ treatment increased with an increase in service years and professional specialization. The results of this study highlight the importance of formulating physical exercise intervention strategies for NCDs patients, and the need to incorporate training for healthcare professionals on the type, intensity, duration, and frequency of physical exercise to prevent NCDs in the Ethiopian healthcare system.

Ethical Clearance

Ethical clearance was obtained from the University of KwaZulu-Natal’s Biomedical Research and Ethics Committee (Reference number: HSS/0683/015D). Permission to conduct the study was also obtained from the Ethiopian Ministry of Health and from each of the 13 hospital managers.

Conflict of Interest

We authors of this manuscript declare that no conflict of interest.

Acknowledgements

We would like to acknowledge those who had participated in this study devoting their precious time.

References

1. WHO (2014) Global Status Report on noncommunicable diseases [Internet]. WHO Library Cataloguing-in-Publication Data Global. Geneva 27, Switzerland.
2. World Health Organization (2015) World Health Organization. Noncommunicable Diseases Progress Monitor [Internet]. Geneva 27, Switzerland.
3. Bueno-de-Mesquita HB (2015) Noncommunicable Diseases of Major Public Health Interest and Prevention. Asia-Pacific J Public Heal 27: 110S-115S.
4. Das P, Horton R (2016) Update on the global pandemic of physical inactivity. Lancet 388: 1255-1256.
5. Mignet A, Mariam DH, Araya T, Ayete K (2012) Patterns of morbidity in public and private hospitals of Addis Ababa, Ethiopia. BMC Public Health 12: 1007.
6. Bayou YT, Bejiga M, Tilaun H (2017) Awareness and Health-seeking Behavior of Urban Residents for NCD in Ethiopia. Ann Glob Heal 83: 72-73.
7. Irwin ML, Alvarez-Reeves M, Cadmus L, Mierzejewski E, Mayne ST, et al. (2009) Exercise Improves Body Fat, Lean Mass, and Bone Mass in Breast Cancer Survivors. Nature 17: 1534-1541.
8. Vichaya EG, Molkentine JM, Vermeer DW, Walker AK, Feng R, et al. (2017) Physical Activity, Fitness, Cognitive Function, and Academic Achievement in 13th edn. USA: Cengage Learning, pp: 1-539.
9. Sallis R (2017) Exercise is medicine: a call to action. Br J Sports Med, pp: 1-3.
10. Hoeger W, Hoeger S (2015) Lifetime Physical Fitness and Wellness: A personalized Program. In: 13th edn. USA: Cengage Learning, pp: 1-539.
11. Miller KR, McClave SA, Jampolis MB, Hurt RT, Krueger K, et al. (2016) The Health Benefits of Exercise and Physical Activity. Curr Nutr Rep 5: 204-212.
12. Lee M, Shiroma EJ, Lobelo F, Puska P, Blair SN, et al. (2012) Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. Lancet 380: 219-229.
13. Gallegos-carrillo K, García-peña C, Salmerón J, Salgado-de-snyder VN, Vázquez-calder G, et al. (2014) Exercise-referral scheme to promote physical activity among hypertensive patients: design of a cluster randomized trial in the Primary Health Care Units of Mexico’s Social Security System. BMC Public Health 14: 1-706.
14. WHO (2014) Global status report on noncommunicable diseases: “Attaining the nine global noncommunicable disease targets; a shared responsibility.” World Health Organization. 1211 Geneva 27, Switzerland.
15. Knight JA (2012) Physical Inactivity: Associated Diseases and Disorders. Ann Clin Lab Sci 42: 320-337.
16. Macauley D, Bauman A, Frémont P (2016) Exercise: not a miracle cure, just good medicine. Br J Sport Med 50: 1107-1108.
17. Stein BD, Dubowitz T (2016) Rx Exercise: Physical Activity is Good Medicine. J Am Acad Child Adolesc Psychiatry 54: 795-796.
18. Butler RN (2012) If exercise could be packed in a pill, it would be the single most widely prescribed and beneficial medicine in the nation. Exerc Med, pp: 1-37.
19. Dacey ML, Kennedy MA, Polak R, Phillips EM, Dacey ML, et al. (2017) Physical activity counseling in medical school education: a systematic review. Med Educ 19: 1-15.
20. Kohl HW, Craig CL, Lambert EV, Inoue S, Alkandari JR, et al. (2012) The pandemic of physical inactivity: Global action for public health. Lancet 380: 294-305.
21. Wen CP, Wai JP, Tsai MK, Chen CH (2014) Minimal Amount of Exercise. J Am Coll Cardiol 64: 64-66.
22. Fie S, Norman LJ, White AE (2013) The relationship between physicians’ and nurses’ personal physical activity habits and their health-promotion practice: A systematic review. Health Educ J 72: 102-119.
23. Hidalgo KD, Mielke GI, Lobelo F, Simões EJ, et al. (2016) Health promoting practices and personal lifestyle behaviors of Brazilian health professionals. BMC Public Health 16: 1-1114.
24. Foster C, Shilton T, Westerman L, Varney J, Bull F (2017) World Health Organisation to develop global action plan to promote physical activity: time for action. Br J Sports Med, pp: 1-3.
25. Salus RE (2009) Exercise is medicine and physicians need to prescribe it, Br J Sport Med. 423: 517-520.
26. Lobelo F, Stoumberg M, Huter A (2014) The Exercise is Medicine Global Health Initiative: a 2014 update. Br J Sports Med 48: 1627-1633.
27. Ramos LR, Malta DC, Gomes GAO, Bracco MM, Florindo AA, et al. (2014) Prevalence of health promotion programs in primary health care units in Brazil. Rev Saude Publica 48: 837-844.
28. Hidalgo KD, Mielke GI, Parra DC, Lobelo F, Simões EJ, et al. (2016) Health promoting practices and personal lifestyle behaviors of Brazilian health professionals. BMC Public Health 16: 1-1114.
29. Stanton R, Happell B, Reabum P (2015) Investigating the exercise-prescription practices of nurses working in inpatient mental health settings. Int J Ment Health Nurs 24: 112-120.
30. Kunene SH, Taiakobong NP (2015) Level of physical activity of health professionals in a district hospital in KwaZulu-Natal, South Africa. South African J Physiother 71: 1-6.
31. Joy E, Blair SN, McBride P, Sallis R (2012) Physical activity counselling in sports medicine: a call to action. Br J Sports Med 47: 49-53.
32. Hebert ET, Caughy MO, Shuvai K (2012) Primary care providers’ perceptions of physical activity counselling in a clinical setting: a systematic review. Br J Sports Med 46: 625-631.
33. Li R, Qu S, Zhang P, Chattopadhyay S, Gregg EW, et al. (2015) Annals of Internal Medicine Economic Evaluation of Combined Diet and Physical Activity Promotion Programs to Prevent Type 2 Diabetes Among Persons at Increased Risk: A Systematic Review for the Community Preventive Services Task Force. Ann Intern Med 163: 452-460.
34. Bezner JR (2015) Promoting Health and Wellness: Implications for Physical Therapist Practice. Phys Ther 95: 1433-1444.
35. Brien MWO, Shields CA, Oh Pi, Foxwells JR (2017) Health care provider confidence and exercise prescription practices of Exercise is Medicine Canada workshop attendees. NRC Res Press 42: 384-390.
36. Tovar G, López G, Ibáñez M, Alvarado R, Lobelo F, et al. (2016) Institutionalized physical activity curriculum benefits of medical students in Colombia. Educ Heal 29: 203-209.
Counseling into the Medical School Curriculum: A Workshop-Based Approach Using Behavior Change Techniques. Am J Lifestyle Med 20: 1-24.

38. Teferi G, Kumar H, Singh P (2017) Physical Activity Prescription for Non-Communicable Diseases: Practices of Healthcare Professionals in Hospital Setting, Ethiopia. IOSR J Sport Phys Educ 4: 54-60.

39. Banday AH, Want FA, Aliris FFA, Alayes MF, Alenzi MJ (2015) A Cross-sectional Study on the Prevalence of Physical Activity Among Primary Health Care Physicians in Aljouf Region of Saudi Arabia. Mater Sociomed 27: 253-266.

40. Annan AE (2013) Exercise is medicine practice in Ghana. EIM Ghana 6: 1-57.

41. Holtzhausen L (2013) Exercise is medicine South Africa. Div Sport Exerc Med Sch Med 27: 1-38.

42. Joyce CL, Tuathaigh CMO (2014) Increased training of general practitioners in Ireland may increase the frequency of exercise counselling in patients with chronic illness: A cross-sectional study. Eur J Gen Pract 20: 314-319.

43. Aslesh OP, Mayamol P, Suma RK, Usha K, Sheeba G, et al. (2016) Level of Physical Activity in Population Aged 16 to 65 Years in Rural Kerala, India. Asia Pacific J Public Heal 28: 535-61S.

44. Lobelo F, Quevedo IG (2016) The Evidence in Support of Physicians and Health Care Providers as Physical Activity Role Models. Am J Lifestyle Med 10: 36-52.

45. Florindo AA, Mielke GI, Gomes GAO, Ramos LR, Bracco MM, et al. (2013) Physical activity counseling in primary health care in Brazil: a national study on prevalence and associated factors. BMC Public Health 13: 794.