

I-PHAN Study - Use of E-learning modules to Promote Physical activity and wellness among Nurses in order to improve mental and physical health: A research protocol for a randomized controlled trial

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Abstract

Aim. To develop and test the effectiveness of an E-learning program for promoting physical activity (PA) and wellness among nurses.

Background. Restrictions during the coronavirus (COVID-19) pandemic drastically changed many people's lives. Maintaining a healthy lifestyle is an everyday challenge faced by the general population. Nurses are one of the health care professionals who are typically well-educated in taking care of patients. There are studies that show that night shifts, extended shifts, and obesity have a correlation with the prevalence of acute low back pain among female nurses. PA is the key factor in the prevention and treatment of many chronic diseases, resulting in an improvement in the quality of life. The impact of social media and technology on our lives is undeniable in the modern era.

Design. This study will be a single-centre, single-blind, randomized controlled trial executed on an E-learning platform to provide the control and intervention groups with a distance learning program. Participants will be randomly assigned to either the control or intervention group. Participants in the control group will only sign up for module 1 of the PA modules, which only comprises information on PA and health promotion. On the other hand, the participants in the intervention group are expected to carry out 3 modules of exercises at home three days a week for a total duration of 8 weeks. The exercises will be performed at moderate intensity (5–6 on the Borg CR10 Scale).

Ethical issues. This trial will comply with the declaration of Helsinki 1975, as revised in 2000. Informed written consent will be obtained from the participants. The Sapienza University of Rome, institutional ethics committee and review board approval will be requested for this study.

Conclusion. Establishing an online PA program with good quality, such as a high level of convenience in access and use, simplified, easy to practice, and made available on social media, can minimize the difficulties faced previously in the implementation of an online PA program for nurses, and may enhance the health and wellbeing of many nurses in healthcare institutions. *Clin Ter 2021; 172 (6):559-563. doi: 10.7417/CT.2021.2378*

Key words: E-learning modules, physical activity, wellness, nurses, COVID-19

Introduction

Restrictions during the coronavirus 2019 (COVID-19) pandemic drastically changed many people's lives. The COVID-19 pandemic has made it difficult for everyone, especially frontline health workers, to maintain a physically active lifestyle. The virus has a very high transmissibility potential. For this reason, the ministerial provisions are all based on avoiding physical contact as much as possible. This measure has inevitably led to the difficulty of carrying out physical activity (PA), closing gyms and fitness centers. Only outdoor physical activity is allowed in the vicinity of our home, respecting social distancing and the correct use of personal protective equipment. Many people, especially nurses after exhausting shifts at work, are confined to their homes with reduced movement and access to fitness training facilities. Normal daily activities, including PA, were disrupted, or significantly reduced (1). Lifestyle interventions via e-learning platforms are needed to attend to the psychological needs of nurses in the COVID-19 era (2). Given the important role of nurses in health promotion and disease prevention, identifying factors that influence participation in health-promoting self-care in nurses is important (3). Considering the countless restrictions, further solutions had to be found to meet our daily needs, namely, carrying out physical activity at home, without any risk of contact with others. Modern technology helps us with this.

Maintaining a healthy lifestyle is an everyday challenge faced by the general population. The dilemma of choosing a beneficial healthy behavior rather than the others shapes the overall health status of a person. There is evidence showing a correlation between low PA levels and the development of chronic diseases (4). Nurses are one of the health care professionals who are typically well-educated in taking care of patients. Nurses are at the frontline of public health and spend considerable time promoting healthy lifestyle behaviours to patients and their families. However, studies of lifestyle behaviours in nurses have typically shown a pattern of non-adherence to public health guidelines regarding PA,

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sedentary behaviour, and diet (5). Overweight and obesity have been found to be significantly higher amongst nurses than amongst other healthcare professionals (6). However, the high physical demands of their jobs put them at health risk. For instance, there are studies that show that night shifts, extended shifts, and obesity have a correlation with the prevalence of acute low back pain among female nurses (7). Moreover, it is not only low back pain that is concerned: heavy lifting and prolonged standing bring about neck pain, lower extremity pain and oedema, upper back pain, shoulder pain, and wrist/hand pain. The prevalence of disabling foot and ankle pain among the general population is quite high, at up to 30%, and it is also common in younger people (8). Musculoskeletal pain can cause loss of motivation to work and is a major cause of sick leave and premature retirement among nursing personnel (9). Obesity increases the risk of diseases including diabetes, heart disease, osteoarthritis, and cancer (10), and increases the risk of musculoskeletal problems, which are a leading cause of sickness absence and are prevalent in nurses (11).

Furthermore, the nature of the nursing profession provides these health professionals with the opportunity to enlighten patients and others about their health factors (12), which makes it more crucial to inform nurses of ways in which they can boost their healthy habits. PA is the key factor in the prevention and treatment of many chronic diseases, resulting in an improvement in the quality of life. (13). Nurses' knowledge of healthy lifestyle behaviors does not necessarily result in healthier lifestyle behaviors, and lifestyle choices outside of the workplace (e.g., low levels of leisure-time PA) are not necessarily compensated for by the nature of the job role (14). There can be many barriers to engagement in healthy lifestyle choices within the nursing working environment. These include lack of access to exercise facilities, barriers to healthy eating practices due to adverse work schedules, individual barriers, and aspects of the physical workplace environment and social eating practices (15). In developed countries, sedentary lifestyles are one of the leading causes of death across the nation, and promotion of PA has been considered one of the examined interventions in primary health care (16). Researchers showed the positive effect of exercise on health and wellbeing (4). One exercise program for nurses, named Nurses Living Fit™, showed a significant reduction in body mass index among nurses, and this led to a healthier lifestyle (17).

The impact of social media and technology on our lives is undeniable in the modern era. These advancements give us the opportunity to suggest initiative approaches in every aspect, one of them being health education and promotion. Developing an online platform to reach out to nurses in order to promote PA among them seems to be an efficient method considering nurses' busy schedule in the hospital (18). There are insufficient studies targeting this specific population with this objective. Moreover, discontinued participation and technical issues have been reported as major limitations in past studies regarding PA and health promotion via the internet (19). Establishing an online PA program with good qualities, such as a high level of convenience in access and use, easy to practice, and availability on social media, can minimize the difficulties faced in the implementation of an

online PA program for nurses, and may enhance the health and wellbeing of many nurses in various healthcare institutions. Hence, for this reason, we are considering developing an e-learning program with the aim of promoting PA and wellness among nurses. These exercises can be done at home by nurses.

Objectives of the study

The objectives of this study are to conduct a single-blind randomized controlled trial consisting of four e-learning modules to determine their effectiveness in improving mental and physical health among registered nurses working at Sapienza University of Rome, teaching hospital in Rome, Italy, and to promote an active lifestyle among nurses.

Ethical issues

This trial will comply with the declaration of Helsinki 1975, as revised in 2000. Informed written consent will be obtained from the participants. The Sapienza University of Rome institutional ethics committee and review board approved this research protocol for a randomized controlled trial on November 10, 2021.

Method

Study design

This study will be a single-center, single-blind, randomized controlled trial executed on an e-learning platform to provide the control and intervention groups with a distance learning program. In this study, registered nurses living a sedentary lifestyle will be recruited from the Sapienza University of Rome teaching hospital (Policlinico Umberto I), in Rome, Italy, and their written consent will be taken to participate in this study (Fig. 1). Participants will be recruited through various departments in the hospital. Participants will be randomly assigned to either the control or intervention group. Participants in the control group will only sign up for module 1 of the PA modules, which only comprises information on PA and health promotion. On the other hand, the participants in the intervention group are expected to carry out 3 modules of exercises at home three days a week for a total duration of 8 weeks.

Inclusion criteria

Nurses aged 25–65 years, sedentary/physically inactive, maintaining stable weight (5% weight loss or gain) for 3 months prior to the beginning of the study.

Exclusion criteria

Nurses with a history of psychiatric illness, neurological and musculoskeletal disorders will be excluded from this study. Moreover, nurses with celiac disease or thyroid gland disease will be excluded from this study because these subjects may have immune and hormonal dysfunction that may compromise the effectiveness of the PA intervention.

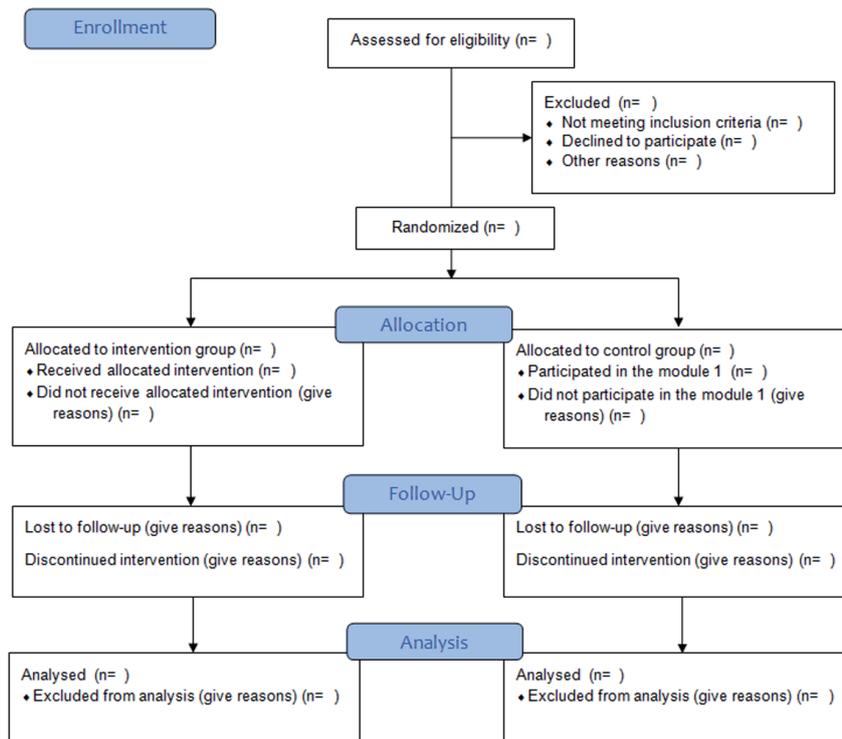


Fig. 1. CONSORT Flow Diagram for the trial

Measurement of maximum heart rate (HRmax)

The maximum heart rate (HRmax) will be measured using the Fox, Naughton, and Haskell formula (Fox-HRmax = 220 age) (20). All the exercises will be performed at a moderate intensity (5–6 on the Borg CR10 Scale) (21).

Primary outcome

- Improvement in mental health and wellbeing
- Improvement in physical health

Secondary outcome

- Knowledge of wellness
- Body weight loss

Video recording

The shooting of the video will take place for a period of 8 weeks. For effective recording of the training sessions, at least two cameras on tripods will be made available, to be used sometimes as handheld cameras. There will be provision for lighting to complement available light, and additional sound-recording devices, microphones, adequate cables to connect cameras to mixing desks, and sound devices adapters for connecting different audio plugs will be made available. Adequate batteries for all devices, battery chargers and power supply units, and memory for all equipment and backup devices, such as laptops with card readers and internal/external hard drive mats for covering cables and preventing people from tripping over them, will be provided for effective video coverage. A computer with

editing software and a multi-camera feature will be used for editing the videos.

The e-learning platform

The video clips and pictures of our training sessions will be uploaded weekly on the e-learning platform of Sapienza University of Rome, and on YouTube. The PA modules can be accessed by the participants through a campus computing log-in and password assigned to staff and students, as well as on our social media platforms. Participants' live exercise routines will be assessed using the Zoom app by two volunteers; one will be the trainer, and the other will be the moderator. The trainer shows the participants how to perform the exercise in the right way, and the moderator plays a role in cueing/technique correction, modifications, timing, encouragement, and ensuring the safety of participants. In case of any exercise-induced adverse events during the training, the moderator phones the emergency room and gives them the address and flat number of the participant. Participants will be instructed to download the Zoom app on their computer, tablet, or computer via <https://zoom.us/download>. Participants must have access to a computer, tablet, or phone with camera capability, and good Internet access, and a comfortable room or space where one can move comfortably and be able to perform the exercise routine in clear view of the volunteers. Participants in the intervention group are expected to watch the trainers perform these exercises on the e-learning platform, and then

carry out these exercises accurately on their own. They are expected to perform these exercises for the rest of their lives and act as role models to patients by recommending PA to them. Regularly, a questionnaire will be used to assess the nurse's perception and adherence to the PA routine on the E-learning platform.

Physical activity modules

Module 1: Role of physical activity in health promotion

It is an introductory lesson to PA, which includes the definition of PA, benefits of PA, types of PA, classification of PA, evaluation of PA, PA recommendation, exercise prescription, PA interventions for health promotion, PA counselling in health and diseases.

Module 2: Yoga, Pilates, and curves training session

Participants will perform 15-minutes of combined yoga, Pilates, and curves training. They will start with a 5-minute flexibility/stretching practice as a warm-up, followed by 5-minutes of yoga, 5-minutes of Pilates, and 5-minutes of curves. There will be a 5-minute rest period in between the sessions. This session will be carried out one day a week.

Module 3: Aerobic and pelvic floor exercises session

Participants will perform 20-minute aerobic and pelvic floor exercises, consisting of 10-minute stair climbing, and 10-minute pelvic floor exercises one day a week at 60–70% of their maximum heart rate (HRmax) (22). There will be a 5-minute rest period in between the sessions. This session will be performed one day a week.

Module 4: Resistance exercise session

The resistance training session will be carried out for 25 minutes. It will be a progressive resistance exercise program for the lower and upper extremities and trunk muscles. Participants will perform squats, push-ups, leg raises, knee extension, unilateral knee flexion exercise, leg adduction/abduction exercise, leg kick back, shoulder press, bench press, bicep curl, triceps dip, lateral flexion exercise, sit-up exercise, and back extension. There will also be a 10-minute rest period during the training sessions. The participants are expected to carry out resistance exercise one day a week.

Data collection

Prior to the commencement of the trial and at the end of the e-learning program, a global PA questionnaire (IPAQ) will be given to the participants to fill out to determine their level of PA and interest in exercise (23). The Short Form Health Survey (SF-12) questionnaire (24) and the Simple Lifestyle Indicator Questionnaire (SLIQ) (25) will be used to analyze the health, quality of life, and lifestyle behaviors of the participants before and after the trial. Demographic characteristics such as age, gender, smoking habits, educational level, years of working experience as a nurse, eating habits, marital status, and family size will be assessed. The

height (m) and body weight (kg) of the participants will be used to calculate their body mass index.

Data Analysis

For the variables that presented normal distribution, Student's t-test will be used. The two-sample Wilcoxon rank-sum (Mann–Whitney) tests and linear regression with standard error adjustments will be used to determine significant changes and differences between modules. All data analysis will be performed using SPSS (IBM Corp. Armonk, NY) software, version 25.

Sample size calculations

Using the software *Epicalc2000*, we assessed the sample size using the following parameters for mental component score (26).

The mean score increase of 10% in the intervention group (from 40 to 44): 4.00.

The mean score increase of 5% in the control group (from 40 to 44): 2.00.

SD: 2.00.

Significance: 0.05.

Power: 80%.

According to this sample size calculation, 30 participants will be recruited for this study. However, we increased the mean score by 10%, considering possible loss to follow up, which requires recruiting and assigning at least 17 participants to each of the groups.

Conclusion

At the end of this trial, we expect an improvement in mood, emotional wellbeing, and physical health among participants in the intervention group, of particular concern in times of pandemics (27). Moreover, an improvement in physical fitness and a robust understanding of PA are expected among participants in the intervention group. The participants are expected to continue exercising throughout their lifetime.

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