Klinika Nefrologii, Transplantologii i Chorób Wewnętrznych

Pomorski Uniwersytet Medyczny w Szczecinie

Dr hab. n. med. Ewa Kwiatkowska

Specjalista w dziedzinie

chorób wewnętrznych, nefrologii, transplantologii klinicznej i medycyny sportowej

Szczecin 23.05.2023

Review of the Doctoral Dissertation

Autor: Yu Hongli

Title: Physical activity and health in pregnancy and the use of online tools

Introduction

Mrs. Yu Hongli's doctoral dissertation entitled "Physical Activity and Health in pregnancy and the use of online tools" was written at the Academy of Physical Education and Sport in Gdańsk under the supervision of Professor Anna Szumilewicz. The basis of the doctoral thesis are four publications, all in journals with a high impact factor. The total IF is 24,371 and total MEiN points value is 450. The PhD student is the first author on all papers. The articles are devoted to the problem of physical activity during pregnancy, the quality of pre- and postnatal health care mobile application, and effects of online, supervised high intensity interval training so called HIIT on the parameters related to the exercise capacity and anaerobic threshold (AT), body weight, and body composition in pregnant women.

The topics taken up by the doctoral student are extremely important

Physical inactivity is prominent health risk factor throughout the pregnancy to postnatal stages. It may cause both short- and long-term health issues for women. During the perinatal period, everything from pregnancy and delivery to nutrient consumption, life taboos, and newborn physical examinations must be closely monitored. Pregnancy and postnatal education and support provided by a multidisciplinary team may enhance the quality of care. However, they may be too expensive or unavailable for all women. The popularity of mobile health (mHealth) and electronic health (eHealth) has changed the conventional model of healthcare services in recent years. More people consult health and lifestyle information via mobile applications (apps), which have the potential to significantly improve current therapy and minimize reliance on professional team health services. The pregnancy to postpartum applications (apps) are becoming increasingly popular. Nevertheless, the apps quality varies significantly. The quality of application should be assessed for the safety of those who use them.

Furthermore, online physical training with apps can improve the effectiveness of training away from sports facilities. It may be beneficial for improving maternal physical and mental health, and represents a major advantage of online exercise training program. Online fitness training, particularly high intensity interval training, so called HIIT (brief bouts of vigorous exercise interspersed with intervals of rest or active recovery), has recently attracted the attention of researchers. Performing HIIT during

pregnancy is safe in terms of obstetric outcomes and well tolerated by pregnant participants, while providing them with the enjoyment of exercise. HIIT interventions either led to an improvement in selected maternal and fetal health parameters or had no impact. No adverse effects were observed. The lack of popularity of HIIT programs for pregnant women may be a consequence of conservative guidelines. Evidence-based recommendations on online prenatal HIIT should be developed and promoted worldwide among pregnant women, exercises, and health professionals.

Description of four publications

In the first paper authors determined, using the online survey, the health believe level (HBL) and physical activity (PA) among Chinese women who were nonpregnant nulliparous, pregnant nulliparous, and pregnant parous; examined the demographic factors and health believe model (HBM) dimensions associated with the prenatal physical activity; made characteristics of prenatal physical activity in subgroups in order to determine the best way to increase the level of prenatal physical activity, taking into account the diverse needs of pregnant women. The study was carried out on 414 Chinese women living in cities. The results demonstrated that the HBL in all groups was acceptable, whereas the prenatal physical activity level was lower than the recommended PA level. These findings may prove useful in establishing population subgroups that require intervention, and they may provide evidence for future recommendation regarding PA during pregnancy.

In the second article the authors described and analyzed the features and functions of mobile apps for pregnancy to postpartum care available in China and the US, examined the apps' security, quality, and effectiveness; and provided suggestions for future development and usage of mobile apps for pregnancy to postpartum care of mothers and children. The authors employed the Mobile Application Rating Scale (MARS) to evaluate app quality through four dimensions of objective app quality, including engagement, functionality, aesthetics, and information quality. A total of 84 mobile pregnancy to postpartum care app were included. The functionality and characteristics of in-store mobile apps for pregnancy to postpartum care varied between China and the US. Both countries' apps, particularly Chinese apps, encountered issues related to a lack of evidence-based information, acceptable content risk, and program evaluation. Both countries apps lacked proper mental health care functions. Basic public health services for women's health may improved with the development of high-efficiency apps.

In the third paper authors described and analyzed the characteristics and functional modules of pregnancy to postpartum nutrition and physical activity (N&PA) apps in the United States and China, evaluated comprehensively the overall quality of pregnancy to postpartum N&PA mobile apps; and investigated the connection between app quality rating and user rating. The authors evaluated 65 maternity-related nutrition and physical activity application, they used Mobile Application Rating Scale (MARS) to evaluate app quality. Apps from both counties, but notably those from China, shared common deficits, including a lack of evidence-based information, the potential for misleading material, and the absence of empirical app assessments. Chinese apps had a higher concentration of educational content, while US apps had a higher concentration of workout-related information. The app quality of both countries was considered satisfactory, and there was no correlation between app quality and user rating. These results highlight the need to provide the reliable information apps present in both nations and suggest that user ratings cannot be used as an objective indicator of app quality. Effective regulation of app information is required to ensure the quality of in-store apps. Women's basic public health-related services may be promoted via the creation of highly effective PtP apps.

In the fourth paper the authors evaluated the effects of an 8-week, online HIIT program on selected parameters related to the anaerobic threshold and body composition during pregnancy; and to examined the relationship between the characteristics of the online exercise intervention and changes in the selected parameters related to the anaerobic threshold and body composition. The study included 69 women with a gestational age of 22 +/- 5 weeks. It was the firs study to assess the effects of an online HIIT program on parameters related to the AT and the body composition of woman with uncomplicated pregnancies. 8-week online HIIT program had a positive impact on the exercise capacity and the body composition in women with uncomplicated pregnancies without producing adverse obstetric and neonatal effects. Despite physiological pregnancy weight gain and pregnancy progression, after the HIIT intervention the parameters related to the AT were better or maintained at the same level. This online protocol can potentially promote exercise programs during the COVID-19 pandemic and in situations where women have limited time or access to sport facilities.

Summary

All clinical trials conducted by the PhD student were properly planned, conducted, and the results obtained were analyzed using correct statistical tools. The research samples, both concerning the number of women surveyed, work 1 and 4, as well as the number of analyzed applications - work 2 and 3, were large enough. This allowed to obtain valuable results. The published papers were created in research teams, which proves teamwork skills. The doctoral thesis is written correctly. The title of the series of four publications corresponds to the topics covered in the articles. The introduction clearly describes the main problems covered in the articles, the author provides research objectives, a description of the results obtained in individual works, conclusions and limitations of the study. Four published articles are attached to the dissertation. The literature cited in published articles is from the last 10 years. The adopted research goals have been achieved and the resulting tasks have been carried out in detail. The conclusions are correct. The obtained results are extremely important for the population of pregnant and post-pregnant women. Such a large research material and carefully conducted research make doctoral dissertation very valuable. It has significant cognitive values, enriching knowledge in the field of health sciences.

Final conclusion

In my opinion, the dissertation of Mrs. Yu Hongli, which I am assessing, in the form of a thematically coherent collection of four scientific articles previously published and reviewed in journals recognized by the international scientific community, meets the statutory requirements in formal and scientific terms. Therefore, I am applying to the High Scientific Council of the Academy of Physical Education and Sport in Gdańsk to admit Ms. Yu Hongli to the further stages of the doctoral procedure and I am applying for the award of the degree of doctor of physical culture sciences. Due to the innovative research, the results published in journals with a high IF, the results, which have a high cognitive value, I apply for the distinction of Ms. Yu Hongli's doctoral thesis.

Dr hab. n. med. Ewa Kwiatkowska
specjalista chorób wewnętrznych,
nefrologii i transplantologii klinicznej,
medycyny sportowej
5718823

Wniosek końcowy

W mojej ocenie dysertacja Pani Yu Hongli, w postaci spójnego tematycznie zbioru czterech artykułów naukowych, opublikowanych wcześniej i recenzowanych w czasopismach uznanych przez międzynarodowe środowisko naukowe, spełnia wymogi w zakresie formalnym i naukowym określone w artykule. 187 ustawy z dnia 20 lipca 2018 r. – prawo o szkolnictwie wyższym i nauce – tj. Dz.U. z 2021 r poz. 478 z późn. zm.

Wnioskuję zatem do Wysokiej Rady Kolegium Naukowego Akademii Wychowania Fizycznego i Sportu w Gdańsku o przeprowadzenie dalszych etapów postepowania w sprawie nadania Pani Yu Hongli stopnia doktora nauk o kulturze fizycznej.

Jednocześnie ze względu na nowatorskie badania, wyniki publikowane w czasopismach o wysokim IF, wyniki, które mają wysoką wartość poznawczą, ubiegam się o wyróżnienie rozprawy doktorskiej Pani Yu Hongli.

Dr hab. n. med. Ewa Kwiatkowska

Klinika Nefrologii, Transplantologii i Chorób Wewnętrznych

Pomorski Uniwersytet Medyczny w Szczecinie

Specjalista w dziedzinie

chorób wewnętrznych, nefrologii, transplantologii klinicznej i medycyny sportowej

Dr hab. n. med. Ewa Kwiatkowska
specjalista chorób wewnętrznych,
nefrologii i transplantologii klinicznej,
medycyny sportowej
5718823