



Review article

The importance of physical activity in improving preconception health

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Abstract

Introduction: Preconception care practices include physical activity, which is identified as an important indicator of behavioural preconception health. A scoping review was conducted to examine the association between physical activity in preconception health and its long-term effects on the later life of the offspring.

Methods: The literature was searched in databases CINAHL, ScienceDirect and PubMed, using keywords determined by the study objective. In total, 755 published manuscripts were identified. Two additional manuscripts were identified through manual searching. A total of 17 manuscripts was selected for the final analysis. The data were extracted and summarized using thematic analysis.

Results: The selected studies were summarized in two categories: (1) studies associated with physical activity and preconception health behaviour ($n = 8$), and (2) studies associated with preconception physical activity, fertility, and pregnancy outcomes ($n = 9$).

Conclusions: Despite limited evidence, other indirect scientific evidence shows that physical activity positively affects health, and is therefore strongly recommended during the preconception period. Policymakers, researchers, and healthcare professionals should join efforts in examining the impact of physical activity on preconception health, fertility and birth outcomes, and effectively translate the findings into preconception health guidelines and public policies.

Keywords: Fertility; Health promotion; Health behaviour; Physical activity; Preconception care; Public health

Introduction

Preconception care encompasses a variety of dimensions of health, such as identifying, managing, treating, and preventing risk factors (biological, behavioural, and societal) that have an impact on preconception health. Providing preconception care is recognised as a primary prevention intervention and can be defined as the provision of health education and health promotion, health risk assessment, and intervention in women and men of reproductive age to modify biomedical, behavioural, or social risk factors that may affect their reproductive possibilities (Barry, 2011; Broussard et al., 2011). Linking health status before conception and later with health risks associated with pregnancy and its outcomes is consistent with a lifespan perspective of women's health (Weisman et al., 2011a). However, preconception health status also plays a fundamental role in men. A man's genetic risks, health status, reproductive history, exposure to environmental hazards, and lifestyle are associated with fertility and can also directly and/or indirectly affect their reproductive health, and thus the environment of the foetus (Delgado, 2008).

Physical activity is generally regarded as a health-promoting behaviour. However, despite the widespread consensus about the importance of physical activity for one's health, the debate remains about the association between physical activity and preconception health in the context of fertility (Gaskins et al., 2016). Overall, physical activity is considered a strong predictor of preconception health with significant effects on women, men, and their offspring throughout the course of life. However, it is still very much understudied (Robbins et al., 2014; Xie et al., 2015).

Regular physical activity is recommended for all people in their reproductive years since it is associated with reduced risk of morbidity, maintaining a healthy weight, and the promotion of preconception health (Donahue et al., 2010). Establishing a pattern of regular physical activity prior to pregnancy, e.g., the preconception period, should therefore become an important component of healthy pregnancy planning. International guidelines for physical activity that are often mentioned while discussing preconception health emphasise moderate exercise of at least 30 minutes a day, 5 days a week, for a minimum of 150 minutes per week (American Society for Reproductive Medicine and American College of Obstetricians and Gynecologists, 2014).

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<http://doi.org/10.32725/kont.2021.051>

Submitted: 2021-06-29 • Accepted: 2021-11-19 • Prepublished online: 2021-11-30

KONTAKT 23/4: 247–255 • EISSN 1804-7122 • ISSN 1212-4117

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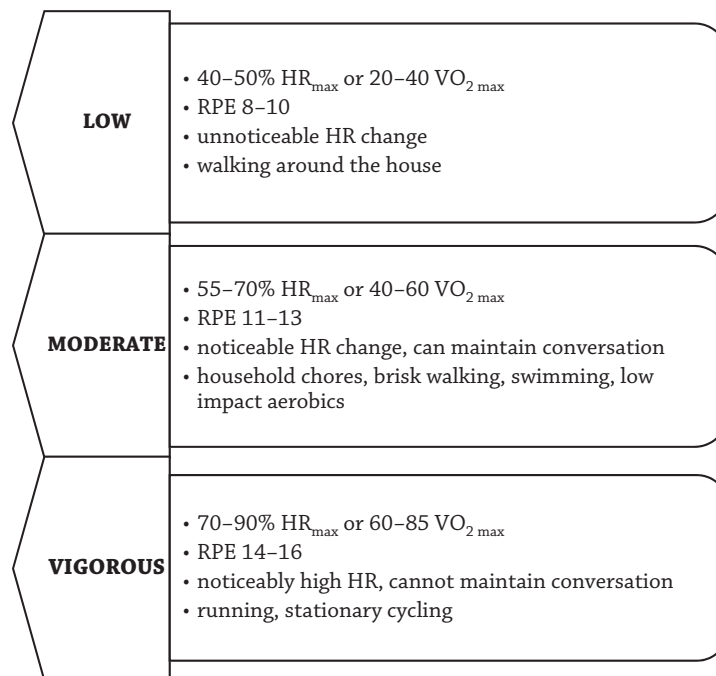


Fig. 1. Physical activity intensity terminology (Harrison et al., 2016)

cologists's Committee on Gynecologic Practice, 2019; Barron, 2013a, b; Moos et al., 2008). These exercise levels are recommended pre-pregnancy, during pregnancy, and for postpartum women (Barron, 2013a, b). Harrison et al. (2016) point out that 150–300 minutes of moderate intensity physical activity or 75–150 minutes of vigorous intensity physical activity, or a combination of the two, should be accumulated each week. In addition, muscle strengthening activities 2 days a week are suggested, along with efforts to minimise prolonged sitting. Physical activity intensity is demonstrated in Fig. 1.

Promoting preconception health and raising awareness about it has become an important public health strategy for improving women's health and reducing infant morbidity and mortality (Williams et al., 2012; Xaverius and Salas, 2013), especially as there is evidence that 55% of women in developed countries aged 18–45 do not meet the current physical activity recommendations (Harrison et al., 2016). To develop effective preconception health promotion strategies that involve actual physical activity engagement, it is necessary to gain insights from studies of preconception health and physical activity and to review the existing recommendations made in this regard. Knowledge is thus needed to design health education and health promotion programmes that reflect a multifactorial approach, as these have been shown to be the most effective ways to address multiple determinants of health behaviour (Vamos et al., 2015).

Materials and methods

A scoping review was conducted to determine the role of physical activity in preconception health and its impact on fertility, pregnancy and the later life of the child, to gain a better understanding when planning health education/promotion in the context of nursing interventions. For this purpose, Arksey and O'Malley's (2005) five-stage framework was used to

guide this scoping review, as those authors emphasise that any method adopted for identifying literature in a scoping study needs to ensure in-depth and broad results. Their five-stage framework includes: (1) identifying the research question; (2) determining the relevant studies; (3) study selection; (4) charting the data; and (5) collating, summarising, and reporting the results. The review also followed the recommendations used in studies by Saari et al. (2018) and Afzal et al. (2018). These recommendations focused on finding a balance between the feasibility and scope of the review, thematic analysis, and the findings' impact on future policy and research.

Sources were searched on the relationship between physical activity and preconception health published in English between 2008 and 2019 in the following databases: CINAHL, ScienceDirect and PubMed. The following search terms, using the standard Boolean Operators were used: "preconception health OR preconception care OR pre-pregnancy care OR fertility" AND "physical activity". The search terms were decided based on a preliminary probing literature search conducted at the beginning of 2019, where the findings suggested a very small amount of literature available on physical activity and preconception health. In addition, the MeSH (Medical Subject Headings) browser was used to check for extra search terms. Besides the criteria mentioned, articles were included if: the full text was available, they were published in a scientific journal, and they involved either men or women. Articles specifically involving physical activity in pregnancy were excluded.

A total of 755 published manuscripts were identified through the database searches and imported into Endnote reference management software. Two additional manuscripts were identified through manual searching. In the first round, the titles were screened for eligibility and duplicates were removed, leaving a total of 43 manuscripts remaining. Following the second-round abstract-screening, 26 manuscripts were excluded (Fig. 2). As this was a scoping review, we did not specifically assess the quality of the studies (articles) included.

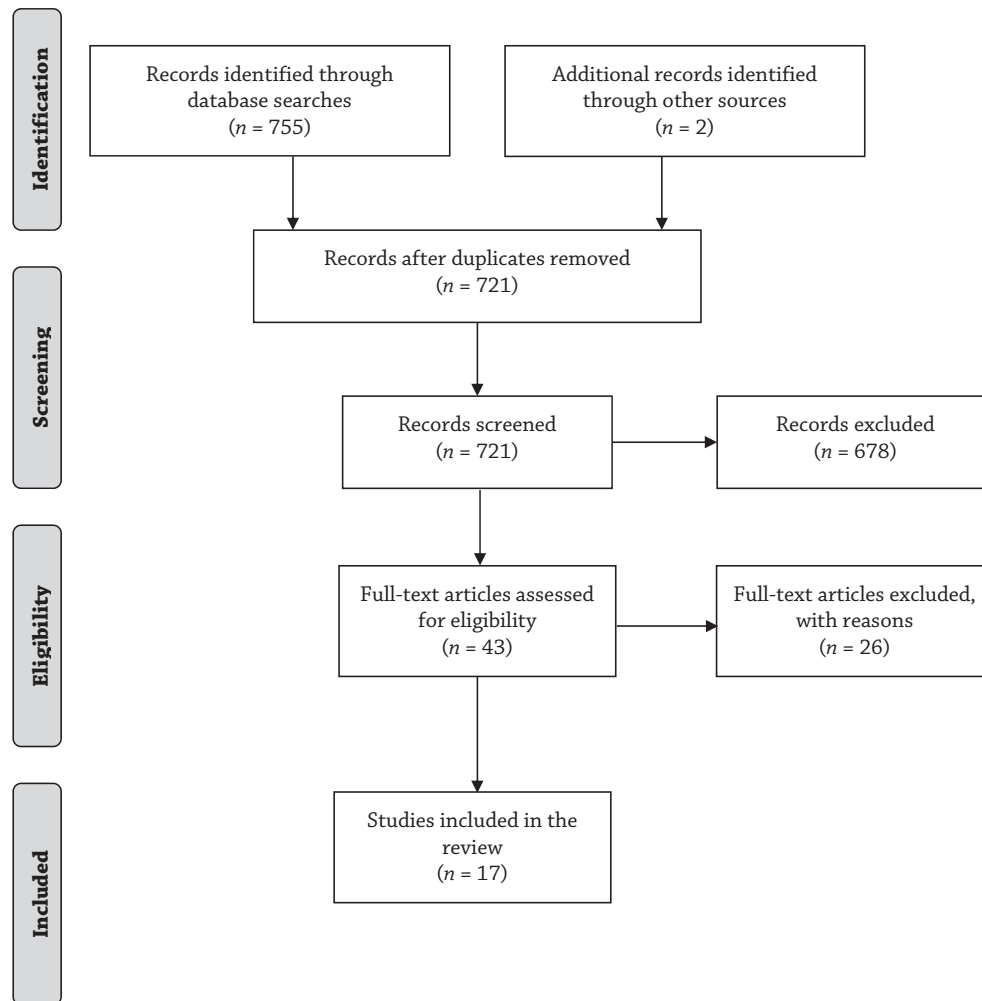


Fig. 2. Flow diagram of the literature selection process

Instead we focused on identifying knowledge gaps related to the role of physical activity in preconception health – as it has also been established elsewhere (Hemsing et al., 2017) that studies on these issues are scarce, and that data is needed to help plan appropriate health-promotion strategies and future research. The final selection of articles included were narratively summarised and categorised by thematic similarities.

Results

Identified studies were thematically organized into two categories: (1) studies associated with physical activity and preconception health behaviour ($n = 8$), and (2) studies associated with preconception physical activity, fertility, and pregnancy outcomes ($n = 9$). The studies found in the review are presented in Table 1 by author, overview of the study/article, study type, participants and findings related to physical activity.

Physical activity and preconception health behaviour

While the effects of certain maternal health behaviour factors during pregnancy on maternal/infant outcomes have been established, research on preconception health behaviour remains hard to find (Delissaint and McKyer, 2011; Toivonen et

al., 2017). While some research highlights the prevalence of unhealthy behaviours in the preconception period, other findings suggest that women with intended pregnancies are more likely to engage in health-promoting behaviours prior to conception (Chuang et al., 2010). Preconception health behaviour and the intention to engage in physical activity is associated with social determinants of health, similar to other health behaviours in pregnancy. Sociodemographic and socioeconomic characteristics show a strong correlation with intention to change preconception health behaviour. Among these, level of education is the most predictive factor. Higher education is positively related with physical activity in the preconception period (Chuang et al., 2010; Delissaint and McKyer, 2011; Donahue et al., 2010). In a study by Donahue et al. (2010), women with 12 years of education were more likely to be inactive before pregnancy than women with more than 12 years of education. The same study also found that the prevalence of self-reported inactivity before pregnancy was highest among non-Hispanic black women (49.5% inactive) compared with other races, among multiparous women compared with those with fewer previous births (49.3%), and among underweight women (51.2%). The prevalence of physical inactivity before pregnancy was also greater among women younger than 25 years of age, among non-white women, among women

Table 1. Description of the included studies/articles

Author/s	Overview of study/article	Study type	Participants	Findings (associated with physical activity)
Badon et al. (2017)	To determine the extent to which trajectories of maternal preconception leisure-time physical activity and sedentary behaviour during adolescence and young adulthood are associated with offspring birthweight, and to test if these associations differ by offspring sex or maternal pre-pregnancy overweight/obese status	Secondary data analysis of a national longitudinal study	1,408 women with ≥ 1 live birth	Three trajectories were identified for leisure-time physical activity, and five for leisure-time sedentary behaviour. Among female offspring, participants with high followed by decreasing leisure-time physical activity delivered offspring with 90g greater body mass and a 72% greater risk of being large for the gestational age (LGA), compared with participants with low leisure-time physical activity; a pattern of high then decreasing leisure-time physical activity among normal weight, but not overweight-obese women was associated with a 2.03 times greater risk of LGA
Baptiste-Roberts et al. (2011)	To ascertain pre-pregnancy physical activity and dietary intake, and estimate the effect of pre-pregnancy lifestyle behaviours on the development of gestational diabetes	Prospective analysis	152 pregnant women	Women with higher pre-pregnancy leisure activity scores were 68% less likely to have a 1-hour glucose challenge test response ≥ 140 mg/dL
Chuang et al. (2010)	To determine whether the intention of future pregnancy affects selected preconception health behaviours (including physical activity) that may impact pregnancy outcomes	Population-based cohort study (2-year study)	847 non-pregnant women with reproductive capacity	Higher education in the youngest age group (18–24 years) was associated with positive longitudinal physical activity; an incident pregnancy (during 2-year study) was less likely among women who were physical active
Delissaint and McKyer (2011)	To determine which factors are associated with preconception health and health-related behaviour	Systematic review	24 identified studies/articles	Regular physical activity before (and/or during) pregnancy is associated with lower risk of gestation diabetes mellitus; women with advanced postgraduate education are more likely to follow preconception health interventions
Donahue et al. (2010)	Evaluate the prevalence of physical inactivity in the 3 months prior to pregnancy, and identify individual socio-demographic, personal, health and behavioural factors predictive of pre-pregnancy physical activity	Cross-sectional study	4,069 women	The prevalence of pre-pregnancy physical inactivity was 39.2%; predictors of physical inactivity prior to pregnancy included higher or lower than normal body mass index, lower educational level, and history of previous live births. Women with 12 years of education were more likely to be physically inactive
Gaskins et al. (2014)	To determine whether paternal physical activity is associated with semen quality parameters and with outcomes of infertility treatment	Prospective cohort study	231 men (433 semen samples) 163 couples (421 intrauterine insemination cycles)	Men engaged in approx. 3.2h/week of moderate-to-vigorous activities; men in the highest quartile of moderate-to-vigorous activity had 43% higher sperm concentrations than men in the lowest quartile; men in the highest category of outdoor activity (≥ 1.5 h/week) and weightlifting (≥ 2 h/week) had 42% higher sperm concentrations than physically inactive; men who reported cycling (≥ 1.5 h/week) had 34% lower sperm concentrations than men who reported no cycling
Gudmundsdottir et al. (2009)	To evaluate the association between physical activity and fertility and parity in healthy women	Population-based health survey	3,887 women	Increased frequency, duration and intensity of physical activity were associated with greater subfertility, and frequency of physical activity was associated with voluntary childlessness; after adjusting for age, parity, smoking and marital status, women who were active on most days were 3.2 times more likely to have fertility problems than inactive women; exercising to exhaustion was associated with 2.3 times the odds of fertility problems versus low intensity

Table 1. (continued)

Author/s	Overview of study/article	Study type	Participants	Findings (associated with physical activity)
Harrison et al. (2016)	To summarise and evaluate the current evidence on the role of physical activity for women in relation to preconception, pregnancy, and postpartum health	Literature review	Not specified	Physical activity intention and participation can be improved with lifestyle counselling for 2–6 sessions; moderate regular physical activity positively influences fertility and assisted reproductive therapy outcomes; preconception physical activity is a strong predictor of continued physical activity during pregnancy; studies exploring health outcomes as a result of physical activity interventions in preconception period are lacking
Hayden et al. (2018)	To explore the current data supporting the link between diet, physical activity, and body habitus as they relate to male reproductive health	Literature review	Not specified	Based on the latest data, exercise excess (extreme training programmes) should be avoided amongst men who are pursuing fertility, whereas moderate activity is preferable
McDonald et al. (2019)	To determine if maternal physical activity moderates the association between maternal body mass index and macrosomia in new-borns.	Cross-sectional study	6,390 women with singleton pregnancies, delivery term (37–44 weeks), live-birth	Nearly 50% and 42% of mothers reported participating in at least 30 min of moderate physical activity, 3 times per week in the preconception and prenatal periods, respectively; neither maternal physical activity in the preconception nor prenatal periods moderated the association between maternal body mass index and infant macrosomia
McKinnon et al. (2016)	To evaluate the association between obesity, physical activity, and fecundability	Prospective cohort study	2,063 non-pregnant women	Moderate physical activity was associated with increased fecundability (≥ 5 vs. < 1 h/week), but there was no dose-response relation; among overweight/obese women (body mass index ≥ 25 kg/m ²), fecundability was 27% higher for vigorous PA of ≥ 5 versus < 1 h/week
Minguez-Alarcon et al. (2014)	To explore the association between physical activity and semen quality	Cross-sectional study	215 men	Physical activity was not related to semen quality parameters. The adjusted percentage differences (95% CI) in semen parameters comparing men in the top quartile of moderate-to-vigorous physical activity (≥ 9.5 h/week) to men in the bottom quartile (≤ 3 h/week) were 4.3% for total sperm count, 7.2% for sperm concentration, 2.42% for sperm motility, and 12.6% for sperm morphology
Toivonen et al. (2017)	To explore the evidence on the importance of various preconception health behaviours, and examine the extent to which specific preconception health behaviours are included in recent studies of such knowledge, behaviours, and intentions	Scoping literature review	94 identified studies/articles	Men's preconception health is often overlooked in studies; weight, diet and physical activity behaviours are given reasonable attention, while others (stress, mental health, harmful environmental substances, and sleep) are overlooked; physical activity as preconception health behaviour was examined in 3 knowledge studies, 11 behaviour studies and 4 interventional studies
Vamos et al. (2015)	To examine community-level predictors of physical activity among preconception women	Secondary data analysis of a national longitudinal study	7,596 non-pregnant women between 18–28 years	74% had low physical activity (< 5 instances of moderate to vigorous activity in the past week) and 26% high physical activity frequency (≥ 5 instances of moderate to vigorous activity in the past week); women more likely to engage in physical activity in the preconception period when living in higher population densities and with a median household income over USD 50,001

Table 1. (continued)

Author/s	Overview of study/article	Study type	Participants	Findings (associated with physical activity)
Weisman et al. (2011b)	To explore the long-term effects of the intervention using data collected at 6- and 12-month follow-ups specifically aimed at changes in health-related behaviour	Randomised controlled trial	362 non-pregnant pre- and interconceptional women aged 18–35 in low-income rural communities	The intervention effect on meeting physical activity level guidelines observed in the pre-post analyses was not maintained at either the 6- or 12-month follow-up
Wise et al. (2012)	To investigate the association between leisure-time physical activity (health-related behaviour) and fecundability among women who were planning a pregnancy	Prospective cohort study	3,628 women aged 18–40 years	An inverse monotonic association between vigorous physical activity and fecundability and a weak positive association between moderate physical activity and fecundability; moderate physical activity was associated with a small increase in fecundability regardless of the body mass index, indicating that physical activity might improve fertility among overweight and obese women; lean women who substitute vigorous physical activity with moderate physical activity may also improve their fertility
Xie et al. (2015)	To examine how maternal preconception nutrition and physical activity are related to birth outcomes among adolescent mothers	Secondary data analysis of a national longitudinal study	1,405 women (833 women in first wave and 572 in the second)	Adolescents who engaged in more episodes of active behaviour had higher birthweights ($p < 0.01$), but hours of sedentary behaviour was not associated with birthweight

who were not married, among women who had children before the current pregnancy, among women with incomes less than 25,000 USD, among women with lower levels of education, among women who were underweight or obese, among women who had smoked before pregnancy, among women whose pregnancy was unintended, and among women who had experienced three or more stressful life events in the year before birth (Donahue et al., 2010). Vamos et al. (2015) also determined that women are more likely to be physically active in the preconception period if they live in an area with a higher population density and have a median household income of above 50,001 USD.

Physical inactivity as preconception health behaviour can be improved by lifestyle counselling that includes 2–6 sessions. Preconception health behaviour is very important as it has been established that preconception physical activity is a strong predictor of continued physical activity during pregnancy (Harrison et al., 2016) – although these findings vary according to socio-demographic differences (Weisman et al., 2011b). As already noted, men's preconception health behaviour is often overlooked, despite strong evidence of its importance for men's health (Toivonen et al., 2017). Today's societal influences that shape the ideal image of a male body ("body habitus") often lead to vigorous physical activity in the preconception period. Based on the latest findings of semen quality in men with vigorous physical activity, excess in exercise should be avoided (Hayden et al., 2018), although the findings do seem inconclusive (Minguez-Alarcon et al., 2014) – Table 1.

Preconception physical activity, fertility, and pregnancy outcomes

Preconception health is increasingly being recognised as a predictor of pregnancy outcomes (Xie et al., 2015). Rare studies point to the relationship between physical activity in the preconception period and its impact on fertility and birth outcomes. Badon et al. (2017) found a relationship between

leisure-time physical activity and bodyweight in female offspring, but this relationship was not established in male offspring. Besides the sex of the offspring, maternal pre-pregnancy overweight/obese status is also associated with trajectories taken in leisure-time physical activity. A similar association between the development of gestational diabetes and preconception physical activity is also established (Baptiste-Roberts et al., 2011). In a more recent study, Xie et al. (2015) found that adolescents who engaged in more of physical activity sessions had new-borns with higher birthweight.

Maternal body mass index is a significant positive predictor of infant macrosomia. This predisposition is a function of maternal metabolic health, which affects the quantity of nutrients/energy that reach the foetus (McDonald et al., 2019). In their study, McDonald et al. (2019) observed that higher levels of maternal physical activity (at least 90 min/week) in the preconception period did not alter the relationship between maternal body mass index and infant size.

Physical activity and its association with male fertility remains unclear because the results of different studies seem to be inconclusive (Hayden et al., 2018; Minguez-Alarcon et al., 2014). Interestingly, one study found certain differences between sperm count and physical activity. It was concluded that certain types of physical activity, specifically weightlifting and outdoor activities, may improve semen quality but may not lead to the improved success of infertility treatments (Gaskins et al., 2014). Contrary to that, Minguez-Alarcon et al. (2014) found no association at all between semen quality parameters and physical activity. They emphasised that literature on physical activity and markers of spermatogenesis among athletes may overstate the potential harms of physical activity on testicular function and may not be generalisable to the population at large. In an earlier study on physical activity and fertility in women, Gudmundsdottir et al. (2009) found that women with the highest levels of frequency or intensity of physical activity had an increased risk of infertility.

Fecundability is defined as the probability of conceiving within a normal menstrual cycle, given regular and unprotected intercourse. Fecundability measures the degree of fecundity. The latter depends on the timing and frequency of coitus as well as biological parameters (Habbema et al., 2004). In a study by McKinnon et al. (2016) and prior to Wise et al. (2012), moderate physical activity was associated with increased fecundability.

Discussion

The identified studies reveal that preconception health behaviour can be influenced by appropriate health-promotion strategies, but these need to consider the influence of certain socio-demographic and socio-economic factors identified as predictors of physical inactivity. These factors must be addressed specifically by these strategies, for women as well as men. The influence of society on the ideal image of a female and male body can encourage adolescents to engage in extreme physical activity. Even though the findings are not conclusive, extreme training programmes should be avoided. This has, in many cases, been related to athletes, yet the impact of societal influences that affect the ideal body image, especially in adolescents, must be considered when planning preconception health-promotion strategies.

The association between preconception physical activity, fertility and pregnancy has been somewhat established, although the level of evidence differs among the identified studies. Despite some inconsistencies among the findings on physical activity, the recommendations should be followed and promoted from an early age. The implications for nursing practice are clear, since preconception counselling interventions show positive results in changing health behaviour (Harrison et al., 2016; Hemsing et al., 2017) and should form a strong element of any preconception health-promotion strategy. There is evidence of the effectiveness of interventions targeting specific health behaviours (e.g., folic acid consumption, smoking and alcohol cessation) in the general population that could be included as part of preconception care. Among women with certain medical or behavioural risk factors (e.g., problem drinkers, diabetics) or who are considering pregnancy, intervention studies aimed at reducing reproductive risks also show favourable results (Williams et al., 2012) – as they improve health literacy, self-management and impact health-related behaviour (Šedová et al., 2021).

Healthcare professionals and all those whose work involves dealing with human physical activity should be more attentive to the preconception health behaviours of young women and men. This interdisciplinary approach must interconnect with the socialisation process – in which health promotion plays a more active role, and even more importantly the health messages need to be conveyed continuously. Indeed, previous studies have demonstrated that preconception health knowledge alone does guarantee behaviour change (Toivonen et al., 2017). Preconception health strategies should therefore extend beyond the health system, and move to the community, schools, childcare, family, etc. They should also consider the cultural context and the impact of socioeconomic circumstances. Primary and secondary schools seem to be an ideal vehicle for influencing health behaviours, as physical activity is part of the curriculum. This multi-faced approach needs to consider contemporary ways of delivering messages to young people, as well as the use of appropriate teaching/learning approaches. In

addition, systemic solutions that address preconception health across the health system, including healthcare and health policy, are essential. This includes training healthcare professionals in their role as health promoters and consultants, as well as policy engagement to prevent social inequalities in sexual and reproductive health. In this context, nurses play an essential role in promoting better preconception health because they are optimally positioned to develop and integrate preconception care into all aspects of their practice. In addition, nurses have an important role in helping key stakeholders in political and community settings to understand the need to design interventions to improve preconception health (Sanders, 2009).

Although the effect of physical activity on health is well known, much less is known about the direct/indirect effect of physical activity in the preconception period on fertility and birth outcomes. In the future, we need more large, comparative, high-quality studies that address physical activity in the preconception period in a more comprehensive way (type, frequency, duration and intensity required for beneficial health outcomes) (Harrison et al., 2016), along with more research oriented to male preconception health (Toivonen et al., 2017). Preconception health promotion that focuses on women's individual responsibility to ensure foetal health has the potential to stigmatise women. However, an approach that does not include men's perspectives can be similarly exclusionary. In this context, and to avoid further perpetuating gender inequalities, future research, strategy development and policy making should consider these issues and concerns (Hemsing et al., 2017).

The objective of this review was to identify and analyse the knowledge gap associated with the effect of physical activity on preconception health. Despite the usefulness of the findings, it has certain limitations that are often associated with this type of literature review (Munn et al., 2018; Sucharew and Macaluso, 2019). Among them is the fact that the scoping review included all study types and bias was not formally assessed. Despite potential limitations, the scoping review revealed a knowledge gap and provided guidance and direction for future research, as well as suggesting an approach for developing health promotion strategies.

Conclusions

The scoping review aimed to explore the research literature on the role of physical activity during the preconception period. The body of literature examining the association between physical activity and preconception health and its impact on pregnancy, postpartum, and later the life of either a child or mother is very limited, and, in some respects, the findings are very inconsistent. Notwithstanding this, an abundance of scientific evidence shows that physical activity positively affects health. Policymakers, researchers and healthcare professionals should therefore combine their efforts to further investigate the effects of physical activity on preconception health, fertility and birth outcomes, as well as the long-term effects of physical activity on health in the later life of the mother or child. This will help to ensure that the evidence is effectively translated into preconception health guidelines and public policy.

Ethical aspects and conflict of interests

The authors declare no potential conflict of interests with respect to the research, authorship, and/or publication of this article.

Funding

The research was supported by the Erasmus+ Programme of the European Union “Preconception health of youth, bridging the gap in and through education – PreconNet” (<https://preco.tamk.fi/>; grant number 2018-1-FI01-KA203-047245). The funding source had no role in the study design, collection, analysis, interpretation of data, the writing of the manuscript, or the decision to submit the manuscript for publication.

Authors' contribution

MP: study design, literature search, writing an initial draft of the article. BZ, PP, APM, PP, JT: critical analysis of the litera-

ture, conceptualising the results and revising the manuscript. All authors approved the article before submission.

Acknowledgements

The first author would like to express special thanks to Senior Lecturer Anna-Mari Äimälä (Tampere University of Applied Sciences, Finland) for her inspiring idea about exploring preconception care and her efforts to research this understudied topic.

Význam fyzické aktivity pro zlepšení zdraví v období před početím

Souhrn

Úvod: Součástí prekoncepční zdravotní péče je i fyzická aktivita, která je považována za důležitý ukazatel prekoncepčního zdraví. Byla provedena přehledová studie s cílem prozkoumat souvislost mezi fyzickou aktivitou rodičů v prekoncepčním období a jejími dlouhodobými následky na budoucí zdraví potomků.

Metody: Relevantní literatura byla vyhledána v databázích CINAHL, ScienceDirect a PubMed s použitím klíčových slov určených cílem studie. Celkem bylo identifikováno 755 publikovaných vědeckých článků. Další dva články byly identifikovány za pomoci manuálního vyhledávání. Pro konečnou analýzu bylo vybráno celkem 17 článků. Data byla vyextrahována z článků a poté shrnuta pomocí tematické analýzy.

Výsledky: Vybrané studie byly rozděleny do dvou kategorií: 1) studie týkající se fyzické aktivity a zdravotního chování před početím ($n = 8$) a 2) studie týkající se fyzické aktivity před početím, plodnosti a výsledků těhotenství ($n = 9$).

Závěr: Navzdory omezenému množství přímých důkazů ukazují jiné nepřímé vědecké důkazy na to, že fyzická aktivita pozitivně ovlivňuje zdraví, a proto se v prekoncepčním období důrazně doporučuje. Tvůrci zdravotnické strategie, výzkumní pracovníci a zdravotníci by měli spojit své síly při zkoumání vlivu fyzické aktivity na prekoncepční zdraví, plodnost a výsledky těhotenství a účinně promítnout zjištěné poznatky do prekoncepčních zdravotních doporučení a veřejné zdravotní strategie.

Klíčová slova: fyzická inaktivita; plodnost; podpora zdraví; prekoncepční péče; veřejné zdraví; zdravotní chování

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