

Waking During Pregnancy: Literature Review

Dr. Mohammad Othman

Assistant Professor of Obstetrics and Gynaecology
Fakeeh College for Medical Sciences, Jeddah, Saudi Arabia

Salah M. Othman

BA in Communication Media and Culture, Al Said Business School
University of Oxford, Oxford, UK

ABSTRACT

There is no agreement among researchers whether exercise is salutary during pregnancy. Utmost studies report that physical activity poses no trouble to either pregnant woman or her fetus. On the other hand, walking is the most generally chosen type of physical activity during pregnancy where it provides several health benefits to the lady and her baby. Standard quest procedures were followed to determine sources from the literature specific to walking during pregnancy for use in this review. Included studies were presented narratively, and appraisal of their methodological quality was conducted using the Jadad quality assessment tool. Walking found to be useful in easing gravidity- related pain and psychological symptoms and reducing gestational weight gain. Nevertheless, inconsistencies in findings between studies hamper the delineation of establishment conclusions on these ultimate issues. Overall, studies demonstrated a positive effect of physical exertion interventions on the well- being and physical and psychological health of pregnant women. Future studies are encouraged and advised to utilise well recognised assessment tools. Community and antenatal health programs advocated to recommend physical activity and exercise during pregnancy.

Key words: Physical activity, Walking, Pregnancy related symptoms, Gestational weight gain, Quality of life.

INTRODUCTION

In the year 2016 World Health Organization (WHO), announced that 1.9 billion adults in the world are overweight and one third of them are obese [1]. Rates of obesity tripled in the last 40 years with more than 15% of the world adult women population overweight [1, 2]. Among women, obesity prevalence lower in the highest income group than in the middle- and lowest-income groups [2, 3]. Obesity and its associated health problems have a significant economic impact on any health care system. Looking at USA, obesity-related medical care costs were an estimated \$147 billion per year [4, 5]. Body Mass Index (BMI) used as a screening tool. If BMI is between 25 and 30 this is considered overweight. While, BMI above 30 deemed obesity [1, 6]. Globally, increase in weight is caused by increased intake of energy-dense foods (high in fat and sugars) and decreased physical activity [7, 8].

Walking has an advantage over other physical exercises because 150 minutes walking per week can provide enough exercise to reach recommended physical activity [2, 9]. This is

exceptionally significant among pregnant women. Most recent studies show increase in the physical activity of pregnant women from first to second trimester [9]. On the other hand, same studies show significant decrease in the physical activity from second trimester to the third [5]. Moreover, they display increase in the sedentary behaviour in the same period. Although, every trimester specific barrier should be considered. Some of these barriers include nausea and vomiting, back pains, fast increase in weight and so on [2, 5]. Many countries recommend walking as the main physical activity for pregnant women. These countries include Spain, Norway, Canada and Japan. The recommendation in those countries is for the pregnant woman to walk 5000 steps daily in first trimester and decrease as pregnancy progress [3, 6, 9, 10].

Walking during pregnancy found in literature to delay and may prevent high blood pressure [6, 9]. Improve glycemic control in patients suffering from gestational diabetes mellitus (GDM) [5]. Added to that, walking in pregnancy found to improve cardiorespiratory capacity and reduce very large weight gain. Moreover, improves sleep quality with decreasing pregnancy stress and anxiety [10, 11]. Therefore, many studies concluded that walking improves quality of life of pregnant women [2, 5, 6, 9, 12].

The objective of this review is to evaluate quality of available literature and evidence. Moreover, study the effects of walking on pregnancy.

METHODS

Without applying any date or language restrictions, search was done for randomized controlled trials (RCT's) assessed the effects of walking as physical exercise on pregnant women with variety of outcomes. Search included Medline, Scopus, ClinicalTrials.Gov, EMBASE, the Cochrane Central Register of Controlled Trials, and Google Scholar databases with the reference lists of electronically full-text papers. Outcomes included pregnancy related pain (lower back pain and lumbopelvic pain), gestational weight gain, Psychological outcomes (anxiety and depression) and lastly quality of life. Inclusion criteria involved RCT's of 18 years or above pregnant women with singleton pregnancy with no medical or obstetrical contraindications for physical activities reporting on one or more of this review outcomes. RCT's involving teenage pregnant women or multiple pregnancy and studies reported protocols, case reports, case series or qualitative studies were excluded.

Data was extracted by both authors and quality of RCT's was checked by them. For quality of included RCT's Jadad scale (Oxford quality scoring system) was used [7, 13]. This standard method for evaluating RCTs consists of three items: randomization, blinding and description of patient withdrawals/dropouts. Full explanation of Jadad Scale is explained in figure 1.

Item	Score
Was the study described as randomized (this includes words such as randomly, random, and randomization)?	0/1
Was the method used to generate the sequence of randomization described and appropriate (table of random numbers, computer-generated, etc)?	0/1
Was the study described as double blind?	0/1
Was the method of double blinding described and appropriate (identical placebo, active placebo, dummy, etc)?	0/1
Was there a description of withdrawals and dropouts?	0/1
Deduct one point if the method used to generate the sequence of randomization was described and it was inappropriate (patients were allocated alternately, or according to date of birth, hospital number, etc).	0/-1
Deduct one point if the study was described as double blind but the method of blinding was inappropriate (e.g., comparison of tablet vs. injection with no double dummy).	0/-1
Guidelines for Assessment	
Randomization A method to generate the sequence of randomization will be regarded as appropriate if it allowed each study participant to have the same chance of receiving each intervention and the investigators could not predict which treatment was next. Methods of allocation using date of birth, date of admission, hospital numbers, or alternation should not be regarded as appropriate.	
Double blinding A study must be regarded as double blind if the word "double blind" is used. The method will be regarded as appropriate if it is stated that neither the person doing the assessments nor the study participant could identify the intervention being assessed, or if in the absence of such a statement the use of active placebos, identical placebos, or dummies is mentioned.	
Withdrawals and dropouts Participants who were included in the study but did not complete the observation period or who were not included in the analysis must be described. The number and the reasons for withdrawal in each group must be stated. If there were no withdrawals, it should be stated in the article. If there is no statement on withdrawals, this item must be given no points.	

Figure 1: Jadad Scale

A Jadad score of 0–2 indicates the RCT is of low quality, whereas a score of 3–5 indicates the RCT is of high quality. Because of the extreme diversity of interventions and outcome measures of the included studies, meta-analysis was not possible. On these grounds, narrative presentation of extracted data was used in this review signifying the differences of reported outcomes as P values.

RESULTS

This review identified 3203 citation record as a result of search strategy. 2607 removed as duplicates. Remaining 596 records were screened for eligibility of inclusion. Only 28 RCT's were included (Figure 2).

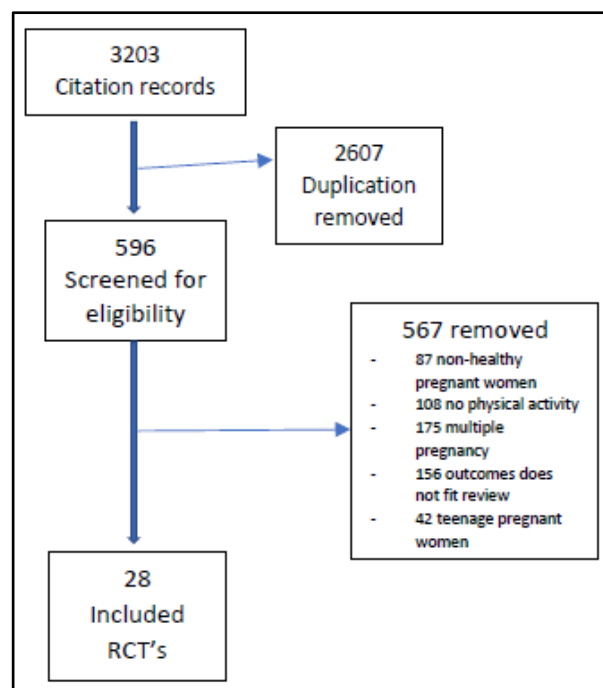


Figure 2: flowchart of literature search

Methodological quality of included trials was assessed using Jadad scale. Overall these RCT's rated as strong in their methodological quality. This is because 24 RCT's (85.7%) was deemed strong [4, 11, 12, 14-34]. Only two RCT's (7%) scored 5 on the measuring scale [11, 12]. Summary of the methodological quality of included RCT's can be seen in table 1.

Table 1: Methodological quality of included RCT's according to Jadad scale

#	Name	Randomization	Method of randomization	Blinding	quality of blinding	withdrawals	total	quality
1	Sterling 2000	1	0	0	0	0	1	Low
2	Suputtitada 2002	1	0	0	0	1	2	Low
3	Garshasbi 2005	1	1	0	0	1	3	High
4	Hui 2006	1	0	0	0	0	1	Low
5	Kinnunen 2007	1	1	0	1	0	3	High
6	Arizabaleta 2010	1	1	1	1	0	4	High
7	Haakstad 2011	1	1	1	0	0	3	High
8	Huang 2011	1	1	1	1	0	4	High
9	Gau 2011	1	1	0	1	0	3	High
10	Kluge 2011	1	1	0	0	1	3	High
11	Colonia 2012	1	1	1	1	1	5	High
12	Eggen 2012	1	1	1	0	0	3	High
13	Hui 2012	1	1	0	1	0	3	High
14	Songoygard 2012	1	1	1	1	0	4	High
15	Stafne 2012	1	1	0	1	0	3	High
16	Miquelutti 2013	1	1	0	1	1	4	High
17	Ruiz 2013	1	1	0	1	0	3	High
18	Ghodsi 2014	1	0	0	0	0	1	Low
19	Ronnberg 2014	1	1	0	1	0	3	High
20	Haakstad 2015	1	1	1	0	0	3	High
21	Ozdemir 2015	1	1	0	1	1	4	High
22	Perales 2015	1	1	1	1	1	5	High
23	Asci 2016	1	1	1	1	0	4	High
24	Haakstad 2016	1	1	1	0	1	4	High
25	Gustafsson 2016	1	1	0	1	0	3	High
26	Da silva 2017	1	1	0	1	1	4	High
27	Sagedal 2017	1	1	1	1	0	4	High
28	Sklembi 2017	1	1	1	0	1	4	High

Included studies published between year 2000 and 2018. More than half of these studies conducted in Europe (15 RCT's, 53.6%) [11, 14, 16, 19-22, 25, 28-34]. Followed by seven studies in the Americas (25%) [4, 12, 15, 24, 27, 35, 36]. Three in the far east (10.7%) [18, 23, 37], and two studies in Iran (7.1%) [17, 38]. Last study was conducted in South Africa (3.6%) [26]. Sample size varied completely between RCT's, ranging from 20 up to 962 participants. All studies reported on different outcomes but only five trials (17.9%) reported on two of this review outcomes [11, 17, 22, 23, 27]. On the other hand, majority of studies (23 RCT's, 82.1%) reported on a single outcome of this review. All studies reported intervention from four to thirty weeks with the majority and the average of 12 weeks. The intervention in all studies is having 150 minutes of walking per week divided on 3-5 sessions per week. All studies kept the intervention as it is throughout pregnancy. No trial reported any complications from walking during pregnancy. Detailed characteristics of included studies can be seen in table 2.

Table 2: Characteristics of included RCT's

#	Name	Country	Setting	Participants	Withdrawals	Outcomes
1	Sterling 2000	USA	Local community	20	5	Gestational weight gain
2	Suputtitada 2002	Thailand	Local hospital	84	7	Back pain
3	Garshasbi 2005	Iran	Local hospital	266	0	-Back pain -Gestational weight gain
4	Hui 2006	Canada	Local community	52	Not reported	Gestational weight gain
5	Kinnunen 2007	Finland	Maternity clinics	122	27	Gestational weight gain
6	Arizabaleta 2010	Columbia	3 local hospitals	64	14	Quality of life
7	Haakstad 2011	Norway	Local community	105	21	Gestational weight gain
8	Huang 2011	Taiwan	Medical center	240	51	-Gestational weight gain -Depression
9	Gau 2011	Taiwan	Local hospital	188	101	Back pain
10	Kluge 2011	South Africa	2 local hospitals	50	4	Back pain
11	Colonia 2012	Columbia	3 local hospitals	80	6	Depression
12	Eggen 2012	Norway	Primary care	257	47	Back pain
13	Hui 2012	Canada	Local community	224	34	Gestational weight gain
14	Songoygard 2012	Norway	Local hospitals	855	136	Depression
15	Stafne 2012	Norway	Local hospitals	855	94	Lumbopelvic pain
16	Miquelutti 2013	Brazil	Local hospitals + 4 primary care	205	4	-Lumbopelvic pain -Anxiety
17	Ruiz 2013	Spain	Primary care	962	138	Gestational weight gain
18	Ghods 2014	Iran	Antenatal clinic	80	Not reported	Gestational weight gain
19	Ronnberg 2014	Sweden	Antenatal clinics	445	71	Gestational weight gain
20	Haakstad 2015	Norway	Local community	105	21	Lumbopelvic pain
21	Ozdemir 2015	Turkey	Local hospital	96	0	Back pain
22	Perales 2015	Spain	University hospital	184	17	-Gestational weight gain -Depression
23	Asci 2016	Turkey	Local healthcare center	102	12	Gestational weight gain
24	Haakstad 2016	Norway	Local community	105	0	-Depression -Quality of life
25	Gustafsson 2016	Norway	Local hospitals	855	94	Psychological wellbeing
26	Da silva 2017	Brazil	Antenatal clinic	639	45	Gestational weight gain
27	Sagedal 2017	Norway	8 local clinics	606	73	Gestational weight gain
28	Sklembi 2017	Croatia	2 local hospitals	45	3	Lumbopelvic pain

Regarding the first outcome of this review, Pain, ten RCT's reported on that [16-18, 21, 26-28, 32, 34, 37]. RCT's in this category reported on lower back pain (6 RCT's) [16-18, 26, 28, 37], and on lumbopelvic pain (4 RCT's) [21, 27, 32, 34]. The difference between participants in each trial was significant of ($P \leq 0.017$). This means all studies authenticate reduction in pregnancy related lower back and lumbopelvic pain in the intervention groups.

Looking at gestational weight gain as an outcome of this review. Fourteen studies reported on this outcome [11, 14, 15, 17, 20, 23-25, 29-31, 35, 36, 38]. Five of these RCT's demonstrate significant ($P \leq 0.043$) lower gestational weight gain in the intervention groups [11, 23, 24, 29, 31]. On the contrary, the remaining nine trials did not reproduce any significant difference in gestational weight gain between groups. On looking back at these trials, participants were not completely adherent to the protocol of the trial and this may explain this insignificance level. It seems like walking during pregnancy may lower gestational weight gain, yet, no firm conclusion can be drawn from this outcome.

With reference to psychological outcomes, seven studies reported on this outcome [11, 12, 19, 22, 23, 27, 33]. Five RCT's reported on depression and express significant difference ($P \leq 0.005$) for the intervention groups [11, 12, 22, 23, 33]. One study reported on anxiety and another reported on psychological wellbeing [19, 27]. Both reported significant difference ($P \leq 0.01$) for the intervention groups. this means all studies authenticate positive effect of walking on pregnant women psychological outcomes such depression and anxiety.

Stretched toward quality of life outcomes, only two studies reported here [4, 22]. Both RCT's disagree on the outcome. While, Arizabaleta 2010, show significant improvement on quality of life of pregnant women in the intervention group [4], Haakstad 2016, did not show any significance [22]. Leading to the comment that this outcome still ambiguous.

DISCUSSION

Pregnancy is known to have different symptoms on women [9, 10]. Pregnancy symptoms experienced by women are diverse mixture including back pain, pelvic pain, weight gain, anxiety, depression, nausea and vomiting. Previous studies established that physical activities moderate and mitigate some of these pregnancy symptoms and many others [2, 5, 6, 9, 10]. This review is intended to summaries the outcomes and evaluate the quality of clinical studies explored the effects of walking on pregnancy symptoms.

This review found that walking during pregnancy is an effective method to reduce back and lumbopelvic pains in all stages of the pregnancy. This finding is going with previous reviews [2, 5, 9]. While, one review gave unconfirmed conclusion on walking in pregnancy but in revision of that review, one included study was not significant and that is the reason for that review final decision [6].

Again, this review found that walking during pregnancy expel positive effect on the depression and anxiety of pregnant women. This is can be explained by the improvement of body image and self-esteem due to increased physical activity and improved fitness. This will improve pregnant woman feelings and fears with the improvement of sleeping and in turn should improve quality of life for that woman. Unfortunately, this review did not establish any improvement in quality of life in pregnant women due to walking. This can be interpreted by the small number of studies investigating the outcome. Moreover, there was heterogeneity between the two included studies with one show significant improvement in quality of life while the other study not demonstrating any improvement. On top of that, one study used Colombian short survey form as the assessment tool. At the same time, the other study used WHO quality of life short form as the assessment tool.

Similar to previous outcomes, this review looked at effects of walking during pregnancy on gestational weight gain. Having physical activity logically expected to lower gestational weight gain as found in many previous reviews. Nevertheless, this review found the same, yet nine of the fourteen studies investigate this outcome did not reach significance and so, did not allow this review to confirm this outcome. This misstep can be explained by the in-adherence of the participants to the protocol of their studies leading to failure of these studies to reach any significant outcomes.

The dominant finding seen in this review was inconsistency between included studies. This can be elucidated by heterogeneity of the characters of the interventions. One major factor could be the variation of methodology of data collection between trials and different tools of assessment for the same outcome. This can be illustrated by looking at studies investigated pain in this review. Some used numerical rating scale (NRS) while others used visual analog scale (VAS) and a few developed their own questioner. Such variations mandates for caution during interpreting the outcomes and results of included studies.

This review suffered many limitations. This review was limited to RCT's, but, other study designs were not considered, and these could significantly contribute more data improving the comprehension of this review. Another limitation is the inconsistency and heterogeneity seen between included studies. This limited the strength of this review and preclude attainment of firm clear consensus on all the outcomes studied in this review. Some of the included RCT's contained two components, physical and dietary, to reach the intended outcomes. Under this circumstance, walking may not idiosyncrasy same effects on its own. Lastly, withdrawal rates show complete variation between studies and this may cause bias in the effects owed to the intervention. Considering all of the above interpretation of this review results should be executed with caution.

To date there is very small and limited number of studies investigating different types of physical activities and their effects on pregnancy related symptoms [2, 5, 6, 9]. More studies are needed to inquire about these outcomes under the conditions of being properly sized with clear assessment tools and fixed statistical methods. On the other hand, antenatal health programs should include physical activity part. Added to that, information on exercises that suit pregnant women should be disseminated to all levels of the community.

CONCLUSIONS

Physical activity is of great importance to pregnant women. walking is part of the vast array of physical activities and have demonstrated varying effects on pregnancy related symptoms. This review evaluated and summarised studies that investigated the effects of walking on pregnancy symptoms.

This review confidently confirms that walking improves back and lumbopelvic pains related to pregnancy. Added to that positively improves any pregnancy symptoms of depression or anxiety. Walking was believed to improve quality of life and lower gestational weight gain, but this was not significant in the included studies. this was due to high levels of heterogeneity experienced between studies.

Future studies should study effects of walking and physical activities on pregnancy related symptoms. Those studies should be appropriately sized using well recognised assessment tools. Community and antenatal health programs should promote physical activity and exercise during pregnancy.

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