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Research article

Sexual health and its related factors among Iranian pregnant women: A review study

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Abstract: *Introduction:* Sexual health is an important dimension of health. Pregnancy is a critical stage in women's lives and can affect couples' sexual health and matrimonial life due to physiological, anatomical and psychological changes in pregnancy. This review was conducted on Iranian studies to assess sexual health dimensions and influencing factors in Iranian pregnant women. *Methods:* This narrative review was carried out by performing a search in Iranian scientific articles published between 2000 and 2018, which considered the dimensions of sexual. Electronic databases including Magiran, Scientific information database (SID), web of science, PubMed, Scopus, and google scholar search engine were searched using the following keywords; sexual health, awareness, belief, attitude, sexual activity, sexual violence, prenatal, pregnancy, and pregnant women. Full text cross-sectional or cohort articles in Persian or English that were related to the field of sexual health of Iranian pregnant women were included in the review. *Results:* Among the initially identified 1383 articles, 63 met the inclusion criteria. Sexual health of pregnant women was examined and categorized into awareness, attitude, belief-activity, performance-satisfaction, quality of sexual life-sexual violence domains. Majority of studies assessed sexual violence (33 studies), followed by sexual function (24 studies), sexual satisfaction and quality of life (4 studies), and knowledge and attitudes about sexuality in pregnancy (4 studies). *Main Conclusion:* The review of published studies revealed that the level of awareness and attitude of Iranian pregnant women about sexual activity was low, while the level of sexual dysfunction

and sexual violence in pregnancy was high. Therefore, the quality of purposeful care and counseling that have been provided hitherto in order to maintain and improve sexual health during pregnancy and even before pregnancy, should be improved. Further longitudinal and meta-analytic studies on the dimensions of sexual health, including sexual activity and sexual satisfaction are recommended.

Keywords: awareness; pregnancy; sexual health; sexual violence

1. Introduction

Sexual health is one of the main aspects of individual health that affects all people of all ages and life stages. Sexual health is stated as a milestone that should be met to accomplish the Millennium Development Goals [1,2]. Based on the definition of the World Health Organization, sexual health is the state of intellectual, mental, physical, and social welfare that are related to sexual tendencies, other than absence of an illness/ disorder or disability [3]. Sexual health has a positive effect on sexuality and requires the enhancement of safe and experiences of delightful sexual, far from threats, coercion, discrimination, and violence in marital relationships [3–5]. Being sexually healthy means that you can easily talk about your feelings and values and be aware of your sexual rights. Sexual health includes all attitudes, emotions, mental and emotional needs, pleasure, satisfaction, self-concept, and respect [6]. Achieving sexual health for everyone means that one can have a life with individual and social morality, enjoy his/her fertility behavior and be able to control them while, avoiding factors that inhibit sexual response and disturb relationships of sexual, including false beliefs, guilt, fear, shame, illness, sexual dysfunctions and deficiencies that interfere with reproductive and sexual function [7].

Pregnancy is one of the most important periods in women's life. Sexual and marital relationships change due to hormonal, physical, social, cultural and changes in psychological during pregnancy [8,9]. Sexual desire and activity of pregnant women and their spouses may decrease or increase or remain unchanged during pregnancy. Therefore, pregnancy can both deepen and break marital relationship [10]. Many women experience remarkable changes in sexual function during pregnancy, including reduced sexual activity, sexual function, and sexual satisfaction. Almost 73% of pregnant women encounter sexual [11,12]. Fifty-five percent of women reported that their sexual satisfaction decreased in pregnancy [13], while 42% stated sexual distress (negative emotions about sex) in pregnancy [14]. For women, pregnancy is a vulnerable time in terms of violence. The prevalence of violence in pregnancy increases in comparison to pre-pregnancy period. Violence is more likely among unintended pregnancies compared to intended pregnancies [8]. Some pregnant women abstain from sex, so violence in sexual relationships often starts or worsens in pregnancy [15,16]. This kind of violence has negative consequences in the parental relationship and socio-emotional development of the child [8,17]. Regarding the importance of sexual health throughout the stages of life, including pregnancy, as well as the long duration of pregnancy and its formative role in couples' sexual relations and family solidarity, sexual health should be one of the main concerns in prenatal care. Until now, there has been no complete information about sexual health during pregnancy in Iran. Therefore, the aim of the current study was to explore the dimensions of sexual health and its related factors among Iranian pregnant women. This review categorized the findings of the articles related to this purpose. This review also tried to summarize the findings of previous studies and consider the challenges in order to suggest precise planning to promote sexual health in pregnancy.

2. Methods

This narrative review was carried out in Iran and pondered the status of sexual health among Iranian pregnant women. The dimensions of sexual health in the studies included awareness, attitude, belief, activity and performance, satisfaction and quality of sexual life, as well as sexual violence.

Article screening was performed in authentic national and international scientific databases, including Magiran, scientific information database (SID), web of science, PubMed, Scopus, Embase, as well as Google Scholar search engines. All articled published within an 18-year period (since the beginning of 2000 until the end of 2018) were included in the search.

Persian and English keywords including "sexual behavior, sexual health, sexual Activity, coitus, sexual dysfunction, sexual violence, attitude, knowledge, pregnancy, perinatal care, and pregnant woman" were used. The MeSH term for all keywords were used.

The inclusion criteria were; full text cross-sectional and cohort articles in Persian or English language pertaining to four dimensions of sexual health on Iranian pregnant women. Exclusion criteria were review articles, clinical trials, articles with qualitative design, articles with non-accessible full text, and studies on the spouses of Iranian pregnant women.

Information was extracted by two authors and, in the event of a conflict, the third author was approached. At this step, the authors first reviewed the abstract of articles and then the full text. Then, the information was recorded in the form of a checklist containing author names, publication year, sample size, place of research, and sexual health dimensions in pregnancy (sexual function, awareness, attitude and sexual beliefs, sexual satisfaction, and sexual life's quality, sexual violence).

In the primary search, 1383 articles were found. Initial revision was carried out to remove duplicate articles using the Endnote software (118 duplicate articles were identified and excluded). After implementing the inclusion and exclusion criteria, 63 articles were qualified for this review.

3. Results

Based on the results of the 63 studies, sexual health of Iranian pregnant women was assessed in four domains; knowledge, attitudes, and beliefs; sexual satisfaction and sexual life's quality; sexual function and sexual violence during pregnancy as follows:

3.1. Knowledge, attitude and sexual beliefs in pregnancy

Five studies assessed knowledge and attitudes and sexual beliefs in pregnancy (Table 1). The findings of these studies are presented below.

According to the study in Karaj, almost 50% of participated women believed that their sexual attractiveness was reduced in pregnancy compared to pre-pregnancy period and 11% believed that sexual intercourse was a sin during pregnancy. Most women referred to fear of injury to the fetus as a major cause of reduced sexual activity the period of pregnancy [18]. The study by Nematollahzade et al. expresses that the belief that "intercourse during pregnancy would damage fetus" was present in 16.8%, 28.6%, 23.9% of women in the first, second and third trimesters respectively. Furthermore, with the increase in gestational age, fear of the fetus injury, fear of miscarriage, infection and the feeling of sin following sex, increased. Although this increase was not statistically significant, it was noteworthy [19].

Ozgoli et al. found that lack of sexual awareness during pregnancy was present in 64.2% of participants. Those who had low awareness had 1.8 times more risk of confronting inappropriate information sources. Findings of this study also expressed that 68.2% of the participants had no positive attitude toward sexual the period of pregnancy. The prevalence of problems in current pregnancy was 44% among women with negative attitude towards having sex during pregnancy. Women with negative attitudes toward intercourse in pregnancy were 2.5 more likely to access unsuitable information sources compared to those with a positive attitude [20]. The results of the study indicated that more than half of pregnant women had a negative attitude about sexual relations the period of pregnancy. And that sexuality increased during pregnancy among those who had a positive attitude. Two thirds of pregnant women were unaware of sexual relationships during pregnancy. There have been significant statistical relationship between knowledge and attitude of pregnant women [21].

Table 1. Conducted studies in the area of knowledge, attitude and sexual beliefs in pregnancy.*

First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Merghati Khoie [18]	2012, Karaj	88, cross-sectional	Researcher-constructed Questionnaire	Declined self-reported sexual attractiveness during pregnancy in 46 participants (53%)
Abasalizadeh [22]	2011, Tabriz	74, Cohort	Researcher-constructed Questionnaire	There was no significant statistical relationship between women's awareness of the impact of sexual relationships on fetal health with nulliparity, level of education and previous education on sexual relationship the period of pregnancy ($P > 0.05$).
Nematollahzade [19]	2010, Tehran	329, cross-sectional	Arizona and Researcher-constructed Questionnaires	There was a significant relationship between the attitude of participants about sex in pregnancy and intercourse ($P = 0.03$)
Heydari [21]	2006, Tehran	266, cross-sectional	Hains questionnaire	Negative attitudes towards sex during pregnancy in 152 pregnant women (57.5 %) and approximately 199 pregnant women (75 %) were unaware of sex during pregnancy.
Ozgoli [20]	2006, Tehran	400, cross-sectional	Researcher-constructed Questionnaire	Knowledge and attitude about coping with problems at the present pregnancy and the source of information had a significant statistical relationship. ($P = 0.008$)

*Note: Studies were arranged according to the years of publication.

3.2. Sexual function in pregnancy

Among the included studies, 22 studies assessed sexual activity in pregnancy (Table 2). Abuzari et al. found that virtually 60% of pregnant women suffered from sexual dysfunction. Low educational level, unintended pregnancy, older age of women, also longer marriage period had a relationship with couples' sexual function [23].

A study in the northern parts of Iran implied that primiparous mothers had higher sexual activity score compared to multiparous mothers after controlling for confounding factors. The number of pregnancies, level of education, state of intended pregnancy, fear of injury to the fetus and mother were the factors that were related to sexual activity [24].

Table 2. Conducted studies in the area of sexual function and activity in pregnancy.*

First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Dadgar [25]	2018, Mashhad	241, Cross-sectional	FSFI	131 participants (54.4%) had sexual dysfunction, and the history of previous childbirth has been related to sexual function.
Hajnasiri [26]	2018, Qazvin	150, Descriptive	FSFI	50 pregnant women (33.3%) had sexual dysfunction
Mousazadeh [27]	2018, Ardabil	100, descriptive-analytic	FSFI	Most sexual dysfunctions (40% (12 people)) were observed in the first trimester of pregnancy.
Tabande [28]	2016, Gorgan	150, cross-sectional	FSFI	The mean score of sexual activity of diabetic pregnant women was 24 ± 4, indicating an unfavorable situation.
Balali Dehkordi [29]	2016, Shahrekord	50, Descriptive	Flexibility and sexual function questionnaire	There has been a significant statistical relationship between sexual activity and body image (P = 0.001) as well as between obsessive beliefs and sexual activity (P = 0.005)
Abouzari-Gazafroodi [23]	2013, East of Guilan	518, cross-sectional	Researcher-constructed Questionnaire	309 pregnant women (59.7%) had lower sexual activity compared to their average sexual activity score
Jamali [30]	2013, Jahrom	257, cross-sectional	FSFI	203 the participants (79.1%) had sexual dysfunction. Majority of participants (119 participants (46.2%)) with sexual dysfunction were in the third trimester of pregnancy.
Nik-Azin [31]	2013, Tehran	150, cross-sectional	FSFI	84 participants (56%) had sexual dissatisfaction.
Jamali [32]	2013, Jahrom	257, cross-sectional	FSFI	Majority of participants (203 people (79.1%)) had been the dysfunction at sexual activity.

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Abouzari Gazafroodi [24]	2013, East of Guilan	544, cross-sectional	Sexual Function Questionnaire	There has been a significant difference between sexual activity and sexual activity domains, except for sexual arousal, between primiparous and multi-parous groups ($P < 0.05$)
Bostani Khalesi [33]	2012, Rasht	143, descriptive-analytic	Arizona	The most common dysfunction of Sexual in each trimester has been the decrease in sexual desire: 39.16% (56 people) in the first trimester, 24.47% (35 people) in the second trimester and 59.44% (85 people) in the third trimester.
Torkestani [34]	2012, Tehran	155, cross-sectional	Researcher-constructed Questionnaire	There was no statistically significant relationship between intercourse and preterm rupture of membranes and preterm labor ($P > 0.05$)
Abasalizadeh [22]	2011, Tabriz	74, Cohort	Researcher-constructed Questionnaire	Pregnant women with lower education level had a higher percentage of intercourse in the last week of pregnancy, but there were no statistically significant in multivariate analysis ($P > 0.05$). The total number of intercourse from the 36th week of pregnancy, having sexual intercourse during the 39th week of pregnancy and husband educational level were three variables as independent predictors of having sexual activity at the end of pregnancy. There was a significant statistical relationship between having more than two sexual activity in the 39th week of pregnancy and preterm rupture of membrane ($P < 0.01$).

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Nematollahzade [19]	2010, Tehran	329, cross-sectional	Arizona	Sexual dysfunction and disorder in sexual desire increased with the progression of gestational age (P < 0.05). Sexual dysfunction: 28% (92 people) in the first trimester, 36.2% (119 people) in the second trimester and 39.3% (129 people) in the third trimester. Sexual desire disorder: 31.8% (34 people) in the first trimester, 45.7% (48 people) in the second trimester and 50.4% (89 people) in the third trimester.
Ebrahimian [35]	2010, Semnan	100, cross-sectional	Researcher-constructed Questionnaire	The most common sexual dysfunction during pregnancy was unwilling to communicate (88%)
Torkestani [36]	2009, Tehran	278, cross-sectional	Researcher-constructed Questionnaire	There was no significant statistical relationship between intercourse and outcomes of pregnancy (P > 0.05)
Bayrami [10]	2009, Tabriz	350, descriptive-analytic	Researcher-constructed Questionnaire	In the majority of pregnant women (58.57% (205 people)), sexual desire and the number of intercourses decreased compared to pre-pregnancy.
Ozgoli [37]	2008, Ahvaz	110, descriptive-analytic	FSFI	Total sexual function score reduced as the pregnancy progressed (P < 0.05). The sexual function’s domain score between three trimesters, there consists of lubrication, desire, excitement, satisfaction, orgasm and dyspareunia, which were observed a significant decrease just in dyspareunia domain with progressing of the trimesters (P < 0.05).
Bayrami [38]	2008, Tabriz	350, descriptive-analytic	Arizona	The most common sexual dysfunction in pregnant women has been reported in the third trimester of pregnancy (21 % (74 people))
Ozgoli [15]	2008, Tehran	400, descriptive	Researcher-constructed Questionnaire	The highest reduction in sexual arousal was in the third trimester (56 % (224 people)) and the highest reduction in the number of sexual intercourse (75% (300 people)) and disorder in sexual desire (75% (300 people)) were in the first trimester.

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Heidari [39]	2005, Tehran	329, cross-sectional	Researcher-constructed Questionnaire	253 pregnant women (77%) were satisfied with their sexual activity. The number of sex and sexuality in pregnancy declined compared to pre-pregnancy (69.5% (228 people)).
Rahimi [40]	2004, Tabriz	120, analytical-descriptive	Researcher-constructed Questionnaire	Sexual desire (38.3% (46 people) in the first trimester, 40% (48 people) in the second trimester and 51.7% (62 people) in the third trimester) and the number of sexual activities among pregnant women (50.8% (61 people) in the first trimester, 53.3% (64 people) in the second trimester and 58.3% (70 people) in the third trimester) decrease with progressing in gestational age.

*Note: Studies were arranged according to the years of publication.

The findings of Bayrami's study indicated that sexual dysfunction was more common in women with an unintended pregnancy. However, among educated and well-income women, it was less prominent. The regression analysis revealed that unintended pregnancy played a more important role in dysfunction at sexual activity in pregnant women compared to other variables [38].

The results of Bostani Khalesi study indicated a significant relationship between education, marital life, feeling of decreased sexual attractiveness, economic status, unintended pregnancy and sexual dysfunction. The rate of dysfunction at sexual activity in pregnant women with high education and income, was lower. Unintended pregnancy was more effective than other variables in the outbreak of dysfunction at sexual activity in pregnant women (OR = 3.6) [33].

The results of Jamali study showed that 61.9% of participants believed that their sexual attractiveness was reduced in pregnancy [32].

In a study in Tehran, there has been a significant relationship between the tendency to have a pregnancy and sexual stimulation, lubrication, total sexual satisfaction and activity [37].

Ebrahimian et al. found that the most common sexual dysfunction during pregnancy was being reluctant to have sex (80%) followed by anorgasmia, anxiety, fatigue, pain, hate of sex and masturbation [35].

In a study in Mashhad, 54.4% of participants had dysfunction at sexual activity. Furthermore, there has been a significant relationship between the previous childbirth and spousal education. Therefore, history of previous delivery was associated with 1.86 unit decrease in the total sexual activity score. And with the increase in spousal education level, sexual activity increased by 1.9 times [25].

Tabande et al. performed a study on diabetic women and discovered no statistically significant correlation between diabetic and non-diabetic pregnant women in terms of sexual activity and marital satisfaction. The degree of marital satisfaction in diabetic pregnant women was moderate to high, but their sexual activity was unfavorable [28].

The results of Nik-Azin study indicated that more than half of the participants had sexual dysfunction during pregnancy. There has been also a negative relationship between the sexual activity

of women and depression and anxiety, though there has been a positive relationship between sexual activity and quality of life. Depression is one of the most important predictors of sexual activity, which had a negative relationship with sexuality and orgasm. There was a relationship between the duration of marriage and sexual activity, so that women who got married for less than ten years, had more sexual satisfaction than those who were married for more than ten years [31].

HajNassiri et al. recognized that 33.3% of pregnant women suffered from sexual dysfunction. Also, depression and anxiety in the first and second trimesters were related to sexual activity. Mental health disorders in the first and second trimesters had the highest effect on pregnant women's sexual activity [26].

3.3. Sexual satisfaction and sexual life's quality during pregnancy

Among the included studies, 5 studies assessed satisfaction and sexual life's quality in pregnancy (Table 3). The findings of these studies are summarized as follows.

The results of the studies implied that majority of pregnant women had a high score in sexual satisfaction [41,42]. Furthermore, there has been a significant correlation between sexual satisfaction and level of educational [10,41,42], age of pregnant woman, spousal age [41,42], duration of marriage, employment status and intended pregnancy [42].

In a study on the quality of sexual life of 300 pregnant women a statistically significant relationship was illustrated between the quality of sexual life and age and level of education of pregnant women [43].

Table 3. Conducted studies in the area of sexual satisfaction and sexual life's quality in pregnancy.*

First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Nezal [43]	2018, Qazvin	300, descriptive-analytic	Quality of Sexual life questionnaire	The sexual life's quality score and the sex satisfaction of pregnant women decreased with the progression of pregnancy (Mean of the sexual life's quality in the first, second and third trimesters were 92 ± 0.88, 79 ± 0/94, 67 ± 1.31 respectively and Mean of the sex satisfaction in the first, second and third trimesters were 24 ± 0.71, 19 ± 0.91, 15 ± 1.12 respectively)
Memarian [41]	2016, Tehran	110, cross-sectional	Hudson Sexual Satisfaction	Almost half of the participants (53 people (48.2%)) had low to moderate sexual satisfaction in the third trimester. There was a significant statistical relationship between sexual satisfaction in pregnancy and demographic factors (P < 0/05).
Ahmadi [42]	2011, Tehran	230, cross-sectional	Hudson Sexual Satisfaction	There was a significant statistical relationship between sexual satisfaction in pregnancy and demographic factors (P < 0/001).

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Abasalizadeh [22]	2011, Tabriz	74, Cohort	Researcher-constructed Questionnaire	Pregnant women with more sexual satisfaction score had a higher percentage of intercourse in the last week of pregnancy, but there were no significant statistical in multivariate analysis (P > 0/05). Mean scores of desire and sexual satisfaction had less trend variation overall the pregnancy.
Bayrami [10]	2009, Tabriz	350, descriptive-analytic	Researcher-constructed Questionnaire	The decrease in sexual satisfaction in pregnant women was highest in the third trimester (62.5 % (75 people)) and lowest (44.7 % (67 people)) in the second trimester. There was a significant statistical relationship between sexual satisfaction and education level (P = 0/02)

*Note: Studies were arranged according to the years of publication.

3.4. The area of sexual violence in pregnancy

Among the included studies, 33 studies assessed sexual violence in pregnancy (Table 4). The findings of these studies are summarized as follows.

The prevalence of sexual violence was reported differently among pregnant women in different cities of Iran. The lowest rate was 3.2% in Sanandaj [44] and Minavast [45]. The highest rate was 55.1% in Marivan [46]. According to the results obtained of the studies, the prevalence of sexual violence in Tehran ranged between 5.5% and 54% [47–50].

A study in Tabriz indicated that 31% of teenage pregnant women and 21% of adult pregnant women encountered sexual violence during pregnancy. Furthermore, there has been a significant statistical difference in sexual violence between teenagers and adult pregnant women [51].

Farrokh Eslami et al. in Urmia found that domestic violence in pregnancy was correlated with the low level of spousal education, spousal unemployment and length of marriage (5–9 years), but was not correlated with the female education level and [52]. Nouri et al. perceived that domestic violence was more usual in housewife women. Furthermore, there was a significant relationship between spousal level of education and sexual violence [53]. The results of the study indicated that sexual violence had a significant statistical relationship with the pregnant women education level and the rate of sexual violence increased with increase education of pregnant women [54]. The results of a study in Hamedan indicated that sexual violence in employed pregnant women was 0.44 times higher than unemployed pregnant women. The odds ratio of sexual violence in employed men was 0.44 times more than unemployed men. The risk of sexual violence in men with mental illness was 2.63 times more than healthy men [55]. The results of the study by Mohammad Hosseini et al. indicated that the most important cause of sexual violence against pregnant women has been their husbands' addiction [56]. Furthermore, other study findings showed a relationship between sexual violence with alcohol consumption, condemnation and unemployment of spouse [57]. Baheri et al. in Karaj reported that the most common of sexual violence the period of pregnancy included compulsion to sexual activity, mental harassment during sex, and cessation of intercourse with wife without her tendency. There was

a significant statistical relationship between sexual violence and occupation and women's education and spousal addiction [58]. Hassanzadeh et al. found that sexual violence was less prevalent compared to pre-pregnancy. Furthermore, there was a significant statistical relationship between sexual violence and husband's addiction (OR = 0 46), and co-counseling of couples (OR = 0/53) [59]. Ali Kamali et al. showed a significant statistical difference between the urban and rural women in terms of sexual violence the period of pregnancy. Also they showed that the rate of sexual violence was higher in educated urban women, as well as educated spouses (university level) and the duration of marriage (between 10 and 15 years). Furthermore, in rural women, sexual abuse was more common among non-addicted spouses [60]. Khadivzadezadeh et al. found that the most common form of violence during pregnancy has been sexual violence, which has been more prevalent compared to non-pregnancy period. Furthermore, polyamory of husband had a relation with the rate of sexual violence in pregnancy [61]. Sarayloo et al. realized that there has been a statistically significant relationship between sexual violence and unintended pregnancy [45]. An investigation in Bandar Abbas found that there was no statistically significant relationship between sexual violence and maternal and fetal pregnancy outcomes [62]. Faramarzi et al showed that women exposed to violence (physical, sexual, and emotional) experienced more abnormal labor, preterm labor, preterm rupture of membranes, cesarean delivery, low birth weight and any hospitalization before delivery in comparison with those who did not have violence [63].

Bagherzadeh showed that sexual violence had a statistically significant relationship with preterm labor, hospitalization due to bleeding in the second trimester, and low birth weight [64]. The results of a study in Karaj indicated that the probability of premature rupture of membranes was 2.6 times higher in women who were compelled to have sex during pregnancy compared to those who has not exposed to sexual violence [65]. The results of a study in Tehran indicated that the rate of severe injury in pregnancy was 3.5%, 0.8% of which were perineal rupture due to severe sexual violence [47,50].

In a study in Kerman, satisfaction with sex, couples' co-operation, trust, and satisfaction with social relationships were correlated with reduced rate of violence against pregnant women [66].

Table 4. Conducted studies in the area of violence in pregnancy.*

First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Moeini [55]	2018, Hamedan	1039 cross-sectional	IPAQ	196 participants (18.9 %) experienced sexual violence during pregnancy. And sexual violence in employed women was 0.44 times more than unemployed women
Nejati Zadeh [62]	2017, Bandar Abbas	725, cross-sectional	Researcher-constructed Questionnaire	The prevalence of sexual violence was 14.8% (107 participants). There was no statistically significant relationship between sexual violence and maternal and fetal outcomes of pregnancy (P > 0/05)

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Hosseini Moqadam [67]	2017, northeastern Iran	174, cross-sectional	IPV	53 people (30.5%) were encountered in sexual violence. There was no statistically significant relationship between sexual violence and fear of delivery (P > 0.05)
Pazandeh [68]	2017, Ahvaz	110, cross-sectional	IPV Standard Questionnaire	52 participants (33.88%) were exposed to sexual violence
Parhizkar [44]	2017, Sanandaj	375, cross-sectional	IPV	12 participants (3.2%) experience sexual violence during pregnancy.
Noori [53]	2017, Kalaleh	368, cross-sectional	Researcher-constructed Questionnaire	53 participants (14.4%) experience sexual violence during pregnancy.
Sarayloo [45]	2017, Minoodasht	300, cross-sectional	CTS2	7 participants (3.2%) experience sexual violence during pregnancy.
Mohammad Ali Zadeh-Cherandabi [51]	2016, Tabriz	408, cross-sectional	IPV	There has been a statistically significant difference between teenage and adult pregnancy in terms of sexual violence (P = 0.034)
Gharacheh [69]	2016, Gachsaran	341, cross-sectional	AAS questionnaire	119 participants (34.9%) were exposed to sexual violence
Ramezani [70]	2015, Shahrud	430, cross-sectional	IPV	109 participants (25.3%) faced sexual violence. The mean score of women's sexual satisfaction (162.5 ± 28.9) was lower than non-violence women (188.7 ± 31.4).
Ali Kamali [60]	2015, Zarand	400, cross-sectional	CTS2	There has been a significant statistical difference between urban and rural women in terms of sexual violence the period of pregnancy (P < 0.05)
Taghizadeh [49]	2015, Tehran	419, case-control	IPV	226 participants (54%) experience sexual violence during pregnancy.
Maghsoudi [66]	2015, Kerman	250, cross-sectional	Researcher-constructed Questionnaire	36 participants (14.43%) experienced sexual violence during pregnancy.
Golchin NAH [57]	2014, Gorgan	301, cross-sectional	CTS2	11 participants (3.65%) experienced sexual violence. There has been a significant statistical relationship between sexual violence and alcohol consumption, spousal conviction, and spousal unemployment (OR = 9.04)
Hassan [71]	2014, Minab and Mahabad	1,300, cross-sectional	IPV	392 participants (30.2%) mentioned sexual violence in pregnancy

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Farrokh-Eslamlou [52]	2014, Urmia	313, cross-sectional	AAS	54 participants (17.2%) experienced sexual violence in pregnancy
Hassan [72]	2013, Minab and Mahabad	1,300, cross-sectional	IPV	392 participants (30.2%) mentioned sexual violence in pregnancy
Abdollahi [73]	2013, Mazandaran	1500, Cohort	IPV	143 participants (10.8%) experienced sexual violence during pregnancy.
Lotf Abbadi [48]	2012, Tehran	600, cross-sectional	SSQ	33 participants (5.5%) were exposed to sexual violence in pregnancy. Violent women had significantly lower self-esteem (Mann–Whitney U test: $Z = -2.12$; $P = 0.034$)
Baheri [58]	2012, Karaj	168, descriptive-analytic	Researcher-constructed Questionnaire	The frequency of sexual violence in pregnancy was 45.2% (76 participants)
Baheri [65]	2012, Karaj	335, descriptive-analytic	Researcher-constructed Questionnaire	76 participants (22.7%) in the case group, faced sexual violence.
Hasanzadeh [59]	2011, Ahvaz	300, descriptive-analytic	IPV	The prevalence of sexual violence in pregnancy was 9.3% (28 participants) and was lower in comparison to pre-pregnancy
Khadivzadeh [61]	2011, Mashhad	190, cross-sectional	Researcher-constructed Questionnaire	The most common form of violence the period of pregnancy has been sexual violence (98 participants (51.6%))
Hesami [46]	2010, Marivan	243, cross-sectional	IPV	The amount of sexual violence in pregnancy was lower than pre-pregnancy (55.1% vs. 69.5%)
Ebrahimi [74]	2010, Maragheh	561, case-control	IPV Standard Questionnaire	Participants who were exposed to sexual violence in pregnancy had equal chance to have a high risk of pre-eclampsia compared to those who did not experience violence.
Mohammad Hosseini [56]	2010, Jahrom	300, cross-sectional	Researcher-constructed Questionnaire	The prevalence of sexual violence was 104 pregnant women (34.7%) in pregnant women
Behnam [54]	2008 Mashhad	290, cross-sectional	Researcher-constructed Questionnaire	277 the participants (95.2%) faced mild sexual violence during pregnancy
Jahanfar [50]	2007, Tehran	1800	WHO questionnaire	423 participants (23.5%) experienced sexual violence during pregnancy, among whom 3.4% (14 participants) reported severe injuries due to violence
Bagherzadeh [64]	2007, Shiraz	400, descriptive-analytic	IPV	89 the participants (22.3%) encountered mild sexual violence the period of pregnancy. Sexual violence has been a significant statistical relationship with some outcomes of pregnancy ($P < 0.05$)

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First author	Publication year and place of execution	Sample size and study type	Instrument	Results
Shakerinezhad [75]	2006, Zanjan	132, cross-sectional	Researcher-constructed Questionnaire	38 participants (28.8%) experienced sexual violence the period of pregnancy.
Salehi [76]	2006, Shahrekord	1600, descriptive-analytic	IPV	The prevalence of sexual violence in the study was 13.8% (221 participants)
Faramarzi [63]	2005, Babol	3275, cross-sectional	Researcher-constructed Questionnaire	702 participants (19.2%) experienced sexual violence the period of pregnancy.
Jahanfar [47]	2002, Tehran	1,800, cross-sectional	IPV	423 participants (23.5%) experienced sexual violence during pregnancy, among whom 3.4% (14 participants) reported severe injuries due to violence

*Note: Studies were arranged according to the years of publication.

4. Discussion

The sexual life's quality plays an important role in the relationship between couples, reinforcement of all aspects of the life of the individual and healthy pregnancy [77]. The results of the study in Qazvin on The sexual life's quality of pregnant women showed that The sexual life's quality and sexual satisfaction was lower in lower gestational age [43].

Ozgoli and Anzaku showed a decrease in the numbers and duration of sexual activity in pregnancy, which was correlated with reduced sexual satisfaction and orgasm. Several factors including emotional relationship with husband, woman's sense of attraction for her husband, self-esteem, and self-regard, affect sexual satisfaction [37,78].

Sexual satisfaction in pregnancy can be affected by some factors including education [10,41,42], duration of marriage, unintended pregnancy [42], age of pregnant women and the common problems of pregnancy (nausea and vomiting) [42,79], sex awareness during pregnancy [79]. By increase in the duration of marriage, sex experiences are increased, and the causes of sexual dissatisfaction are eliminated. With the increase in the level of education, knowledge and attitudes toward sex, subjects satisfaction will be increased [42].

This reviewed showed that the knowledge and attitude of pregnant women about sex during pregnancy was low. Pregnant women refrain from coitus during pregnancy because of the fear of injury to their baby, abortion, bleeding, preterm labor, and abnormal bleeding [8,13,30,80–82]. Studies described that lack of awareness and negative attitude of couples towards sex during pregnancy can result in anxiety and stress in them as well as cause fear of sex during pregnancy [13,83].

The results of previous studies performed in Iran indicated that sexual dysfunction during pregnancy was more common in the third trimester compared to the first and second trimesters [19,30,33,38]. These results have been similar to previous results of studies in Brazil [84], Turkey [85] and Egypt [86]. In a study in Thailand (2011) a high prevalence of sexual dysfunction (90.8%) and decreased scores in the domains of sexual activity were reported among pregnant women [87]. The high prevalence of dysfunction at sexual activity in the third trimester can be due to the fact that vaginal contractions are less common, and muscle spasm that occurs during sex is effective on orgasm [8]. Furthermore, during the third trimester, the uterus is enlarged, which results in

hypopnea, therefore coitus becomes annoying [88]. These factors reduce sexuality and increase sexual dysfunction during the third trimester compared to the first and second trimesters.

The results of some studies in Iran showed a decrease in sexuality with increase in gestational age [19,36,37], which has been similar to previous results of studies in Turkey [89] and China [81].

The reasons for loss of sexuality in pregnancy include fear of harm to the fetus, abortion, preterm labor [10,36], feeling of sin resulting from imagination mother having sex with fetus in the uterus [37,87,90] as well as the sense of reduced attractiveness. In a study in Portugal (2009), 41% of women reported declining in sexual attractiveness in comparison to their pre-pregnancy period [13].

The findings of this review indicated that, the demographic factors related to the participants and their spouse affect sexual activity in pregnancy. High level of education in spouse (25) and pregnant woman [22–24,33], and higher economic level [33,38], improve the sexual activity of pregnant women. Education level is considered as one of the predisposing factors of personality to control behaviors [91]. Individuals with higher levels of education are more healthy and have less sexual problems compared to those with lover levels of education [23].

Different fertility factors affect sexual activity, including intended pregnancy, number of pregnancies and history of delivery. In the study, there has been a significant statistical difference in the total score of sexual activity between multiparous and primiparous women [11]. Furthermore, the results of some studies indicated that unintended pregnancy had a more significant effect on the incidence of dysfunction at sexual activity in pregnant women compared to other factors [23,24,33,37]. Unintended pregnancy can affect women's physical and mental health [92,93]. In addition, unintended pregnancy results in stress that causes emotional problems. Therefore, all the mentioned factors increase the risk of sexual dysfunction [94].

Among the factors affecting women's sexual activity are mental health disorders. In some studies, mental health disorders, including depression and stress [26,31] and anxiety [31], had a significant relationship with sexual activity in pregnant women. Nick Azin et al., found that depression was the most important predictor of sexual activity of pregnant women [31]. The results of a study in 2016 indicated that the greatest influence of depression was on sexual stimulation and interest and the treatment of sex disorders was associated with the treatment of depression [95]. Furthermore, according to Johnson and Kaplan's theory, anxiety has an undesirable effect on sexual stimulation and higher levels of anxiety can disturb sexual activity [96].

Body image is defined as one's perception and imagination about the body. Body image is one of the factors that can be changed under the influence of physical and psychological changes during pregnancy [97,98]. During pregnancy, the pregnant woman's body moves quickly toward physical changes that are visible in weight and physical state. These changes are accepted by some pregnant women but are critical for others. Similar to the findings of this study, the results indicated that higher rate of body image and obsessive was accociated with worse sexual activity in pregnant women [29].

The prevalence of sexual violence in pregnancy in the reviewed studies ranged between 2.3% and 55.1% [44,46]. A systematic review and meta-analysis study in Iran, reported that the prevalence of sexual violence in the period of pregnancy was 31% [99]. The prevalence of sexual violence was stated 20.7–26.5% in Africa [100], 3.4% in Turkey [101], 26.2% in Lebanon [102], and 6.9% in Saudi Arabia [103]. The different prevalence rates for sexual violence in different countries and societies is due to the lack of a standard definition, different methods of assessment, and the unwillingness of women to report violence due to of cultural factors, taboos and fears cause sexual violence cases keep be concealed. Furthermore, some cultures may not consider forced sexual relation among married

people as sexual assault, while psychologists consider it as sexual assault and domestic violence [57]. The reason for the increase in sexual violence during pregnancy can be due to an increase in the reluctance of the pregnant women to have sex in comparison with pre-pregnancy [61].

Some studies showed that housewife pregnant women are more vulnerable to violence [53,65,75]. This can be due to financial independence, the ability to communicate and have the necessary communication skills in employed women. But a study showed that wife abuse occurred more significantly among employed women due to tensions and tiredness from the workplace [104].

The results of some studies indicated a relationship between the level of spousal education and sexual violence [53,55], indicating that sexual violence was lower in educated spouses [53]. This finding may be due to the effective role of education on recognizing and respecting the rights of the wives. Furthermore, pregnant women with higher education level are able to use various life skills, including anger control and problem-solving, in matrimonial relationships. In some studies, the increase in the level of education of pregnant women was found to be accompanied by a reduction in violence [53,54].

The reviewed studies on Iranian pregnant women showed that sexual violence was associated with pregnancy outcomes [63–65,74]. Some studies stated that abused pregnant women had higher levels of stress and lower emotional support from their spouses or sexual partners than the control group. Amid women with domestic violence, some stress mediators are released in the body that may lead to pre-eclampsia [105,106]. Misbehaviors by the spouse, through physical and sexual harms and also the release of stress hormones can lead to preterm labor and low birth weight [107]. In some studies, sexual violence during pregnancy was found to result in the increased incidence of low birth weight and preterm labor [108,109], as well as depression, vaginal bleeding, abortion, reduced prenatal care, increased gestational hypertension, preeclampsia, and increase in sexually transmitted diseases [109].

5. Final conclusion

The results of this review study imply that the knowledge and attitude of Iranian pregnant women towards sexual activity was low. Furthermore, there was a high level of sexual dysfunction and violence in pregnancy. The observed differences in the level of sexual dysfunction and violence and level of knowledge can be due to lack of specific standardized questionnaire in pregnancy, differences in sampling method and type of studies. It is suggested that longitudinal studies on the various dimensions of sexual health throughout pregnancy, and systematic reviews and meta-analyses be conducted on the dimensions of sexual health, including sexual activity and satisfaction, among Iranian pregnant women. According to the results of this review, identifying the challenges and changes during pregnancy will help by health care workers, especially professional midwives to plan interventions to increase the sexual health of pregnant women. Furthermore, there is a need for systematic and extensive counseling on sexual health based on care service packages and scientific counseling during or even before pregnancy in order to develop effective measurements to enhance all dimensions of sexual health, and consequently to improve satisfaction of matrimony and family solidarity.

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Conflict of interest

The authors declare no conflict of interest.

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