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REVIEW



Spouses' perceptions of and attitudes toward female menopause: a mixed-methods systematic review

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ABSTRACT

Objective: Menopausal women experience physical and psychological discomfort, which may be affected by their spouses' perceptions of and attitudes toward menopause. The purpose of this review is to summarize men's perceptions of and attitudes toward female menopause in different cultural contexts.

Method: A sequential integrated design method was used in this mixed-methods systematic review. PubMed, Web of Science, PsycINFO, Cochrane, Embase, China National Knowledge Infrastructure, and the Wanfang database were searched. Studies on spousal perceptions of and attitudes toward female menopause were included in the analysis.

Results: A total of 12 articles met the inclusion criteria. Men have little knowledge of menopause and health-care status. Men have different attitudes toward wives' changes during menopause. A large proportion of them cannot cope with these changes, possibly due to poor knowledge about menopause; aging and disease; psychological changes; religious and other internal factors; and external factors, including family life, work stress, and wives' menopausal symptoms. In addition, spouses' perceptions of and attitudes toward menopause may affect women's menopausal symptoms, attitudes toward menopause, and marriage relationships.

Conclusion: Although there was little evidence, it seems that male spouses' perceptions of and attitudes toward female menopause are important factors affecting menopausal women's quality of life.

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Menopause; spouses; perception; attitude; social support

Introduction

Menopause is the inevitable stage of female reproductive aging in which physiological changes characterized by fluctuations in sex hormone levels occur; this stage can last for years or even a decade¹. Studies have shown that most women experience varying degrees of physical and psychological symptoms during the menopausal transition², which may threaten women's quality of life and long-term health. Thus, helping women through menopausal transition has become an important issue in female health care³.

Many measures have been taken to improve women's quality of life during menopause over the years, such as hormone replacement therapy, lifestyle intervention, and psychological counseling^{4–6}, which are all forms of personal health care for women. Studies have shown that external factors, such as work and life pressures and social support levels, also have important impacts on menopausal symptoms^{7,8}. Several studies have indicated that the severity of menopausal symptoms seems to be associated with the levels of women's perceived social support⁹, and family and emotional support play an important role. Most menopausal

women have children who are studying or working away from home and aging parents. At this time, the family members who most often accompany these women are their spouses, so spousal support is the principal source of family and emotional support for women. In Murphy *et al.*'s¹⁰ qualitative study, Arab premenopausal and postmenopausal women reported that how they experienced menopause depended on the levels of their husbands' support, and the lack of such support could lead to negative consequences, such as depression and suicide. Moreover, Dillaway¹¹ indicated that active interaction between partners in perimenopause could help women relieve menopausal symptoms and follow health programs. However, these results referred only to women's self-feelings. Few studies have investigated the impact of spouses' actual levels of support on their wives' menopause.

According to the knowledge–attitude–behavior model¹², men's perceptions of their wives' menopause may affect their attitudes toward it and thus affect their supportive behaviors. In recent years, a number of studies have reported that health education for couples can improve men's level of

knowledge about menopause and perceived social support for their wives, but these studies did not investigate changes in men's attitudes^{13,14}. At present, most scholars focus on women's own perceptions, attitudes toward menopause, and perceptions of social support¹⁵. Only a few studies have directly explored the perceptions, attitudes, and coping style of male spouses toward female climacteric periods, as well as their effects on their menopausal wives.

The purpose of this review is to summarize male spouses' perceptions of and attitudes toward female menopause in different cultural contexts, the factors affecting their perceptions and attitudes, and the outcomes on which their perceptions and attitudes have an impact. This study is the first to review male spouses' perceptions of and attitudes toward female menopause. The study aims to provide evidence for the importance of spousal support for women during the menopausal transition.

Methods

A total of seven electronic databases were searched, including PubMed, Web of Science, PsycINFO, Cochrane, Embase, China National Knowledge Infrastructure, and the Wanfang database. The authors searched for articles published through January 2019. The search terms were (perimenopaus* OR climacteri* OR menopaus*) AND (Spousal OR 'Domestic Partner' OR 'Domestic Partners' OR 'Married Persons' OR 'Married Person' OR husband* OR spouse*).

Inclusion criteria

Articles were included if they satisfied the following criteria: the subjects included the partners or spouses of menopausal women; the contents of the study included the perceptions and/or attitudes of the spouses or partners toward female menopause; and the full text of the article was available.

Quality appraisal

The Joanna Briggs Institute (JBI, 2017)¹⁶ Critical Appraisal Tools were used to evaluate cross-sectional and qualitative studies, and the Mixed Methods Appraisal Tool (MMAT, 2018) was used for mixed-methods studies. The MMAT is a critical appraisal tool designed for the review of systematic mixed-methods studies¹⁷.

Data extraction

Two researchers extracted general information from the articles after reading the full texts; when there was disagreement, these researchers discussed the issue with the third researcher. The extracted contents, including the author, year, country, purpose, participants, research design, data collection method, and main results, were discussed by the research team.

Synthesis

Data integration followed the sequential synthesis design method for the mixed-methods systematic review¹⁸. The first step was to summarize and compare the quantitative results in the quantitative and mixed-methods studies. Due to the different methods in various studies, meta-analysis could not be conducted. We used a descriptive method to analyze and summarize the quantitative results. The second step was to integrate the qualitative results using thematic analysis, and we developed the codes inductively and deductively. Two researchers conducted the coding based on the research questions and results, and the work of both researchers was summarized to form the final version of the code. The main themes were then identified by summarizing the data for each code. Finally, we integrated the results of the first and second steps.

Results

Search results

A total of 1286 articles were searched. After the articles were checked for duplicates, 780 articles remained. Two researchers screened the articles according to the inclusion criteria and ultimately obtained 10 articles. We found four related articles through manually searching references; of these four articles, the full texts of two articles could not be obtained. Finally, 12 studies were included for data extraction and analysis, including seven quantitative studies, four qualitative studies, and one mixed-methods study. The literature screening process is shown in [Figure 1](#).

Quality appraisal

After reading the full texts, two researchers independently evaluated the quality of the articles. If there were different opinions, a third person participated in the discussion, and the group came to a decision together. The JBI Critical Appraisal Tool was applied to evaluate the quantitative studies because the contents of the studies concerned the attitudes of men, confounding factors were difficult to identify and control, and none of the six studies clearly stated the confounding factors or the strategies to address them. Similarly, the JBI Critical Appraisal Tool for qualitative studies was used to evaluate four qualitative studies. Three of the studies did not cite philosophical views, and two did not describe the potential influence of the researchers' cultural and theoretical backgrounds on the studies. The risk of bias in the mixed-methods study was assessed with the MMAT. The quality evaluation reports are shown in [Supplementary Tables S1–S3](#).

Characteristics of the studies

The 12 studies included in this review investigated 1492 male spouses of menopausal women from eight countries: the USA ($n = 1$), Brazil ($n = 2$), Canada ($n = 1$), Germany ($n = 1$), Poland ($n = 1$), Turkey ($n = 2$), India ($n = 1$), and China

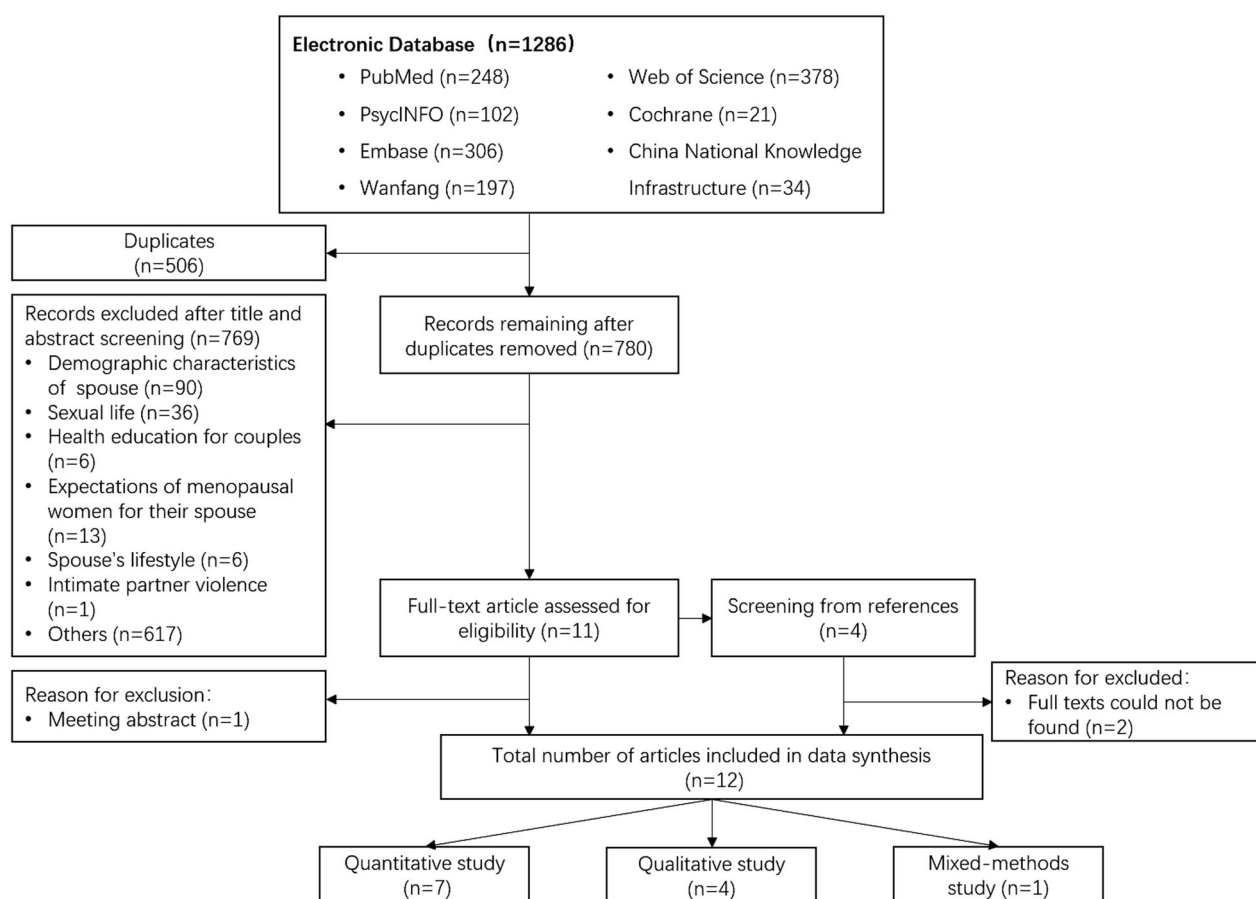


Figure 1. Study flow diagram.

($n=3$). The publication period ranged from 1992 to 2018. General information about the studies is presented in Table 1.

Most of the research tools adopted self-designed questionnaires on the following topics: climacteric knowledge, including common symptoms; knowledge of health care; and male spouses' attitudes toward their wives' menopause. Two other studies^{23,25} used two kinds of scales to measure the husbands' attitudes toward female menopause: the Attitudes Towards Menopause Scale (ATMS) and the Menopause Attitude Scale (MAS). Both have often been used to measure female attitudes toward menopause. The ATMS was developed by Neugarten *et al.*³¹ and has a cut-off point of 40; lower scores represent more negativity. The MAS was developed by Bowles³²; on this scale, a higher score represents a more positive attitude.

Results from quantitative evidence

Spouses' perceptions of female menopause

Spouses knew little about menopause, menopausal symptoms, and the health care of their wives. Three studies^{20–22} that investigated only the personal responses of husbands showed that most men knew little about their wives' menopause in China. Szpak *et al.*²⁴ and Papini *et al.*²⁵ also collected and compared the responses of couples and found that men's reports were inconsistent with their wives' actual statuses; men were unaware of their wives' menstrual

statuses, wives' menopausal symptoms were greater than those perceived by their husbands²⁵, and wives' hormone use was lower than that reported by husbands²⁴.

Moreover, Sun *et al.*²⁰ reported that 60% of men's knowledge about menopause came from the Internet. Mu *et al.*²¹ found that only 4/63 husbands received knowledge and information through discussions with their wives and accompanying their wives during medical treatment.

Attitudes of spouses toward female menopause

Spouses' positive attitudes and coping styles related to menopause. Most men had positive attitudes toward their wives' menopause and took measures to address it^{19,21,23–25}. Shukla *et al.*¹⁹ found that the three most commonly used coping mechanisms among the husbands of women who had been going through menopause for less than 5 years were acceptance, religion, and positive reframing. Mu *et al.*²¹ showed that 38% of the husbands of women with depressive symptoms were able to take positive measures for their wives, for example, they would be more considerate toward and tolerant of their wives or share housework proactively.

Spouses' neutral or negative attitudes toward menopause.

Some men showed neutral or negative attitudes toward their wives' menopause^{19,22,24}. Szpak *et al.*²⁴ found that 20% of men were unwilling to have contact with their wives. Similar to Shukla *et al.*'s¹⁹ study, although most of the participants

Table 1. Details of the included studies.

Author (year)	Country	Purpose	Participants	Research design	Data collection method	Main results
Shukla et al. (2018) ¹⁹	India	To investigate the prevalence and severity of postmenopausal symptoms, their impact on the QOL of rural women, and the coping mechanisms of couples	100 couples in India during 10 years of natural menopause	Cross-sectional	MENQOL Brief cope questionnaire Personal Health Questionnaire: depression	Active emotional coping appeared to be the most utilized coping mechanism by men. The three most commonly used coping domains were acceptance, religion, and positive reframing. Wives' perimenopausal changes could be recognized by husbands, but the husbands could not understand and were not willing to accept the menopausal transition, and they thought it did not merit too much attention
Sun et al. (2017) ²⁰	China	To investigate knowledge of perimenopause in spouses	160 husbands of perimenopausal women aged 45–55 years	Cross-sectional	Self-designed questionnaire: knowledge of menopause and knowledge source	A total of 60% of men's knowledge about menopause came from the Internet. A total of 41.9%, 45.2%, 30%, and 35% of husbands had basic knowledge, nutrition and diet knowledge, sex hormone use knowledge, and health-care knowledge, respectively. Knowledge of nutrition, diet, and health care differed significantly based on education level and monthly family income ($p < 0.05$)
Mu et al. (2016) ²¹	China	To investigate knowledge of perimenopause in spouses and its impact on physical and psychological symptoms in perimenopausal women	200 couples with women aged 45–60 years in the perimenopausal period	Cross-sectional	Women: SDS Men: self-designed questionnaire: knowledge of menopause, attitudes toward wife's changes, and coping method	In total, 63/200 perimenopausal women had depressive symptoms; 24/63, 24/63, 49/63, 22/63, 18/63, and 7/63 husbands had knowledge about menstrual disorders, vasomotor symptoms, neuropsychiatric symptoms, genitourinary symptoms, osteoporosis, and cardiovascular and other symptoms, respectively. None of the husbands sought relevant knowledge or professional advice, and 2/63 spouses discussed perimenopause with their wives and accompanied their wives during medical treatment; 13/63, 16/63, and 24/63 spouses shared housework, were more considerate and tolerant, and understood the personality changes of their wives, respectively
Cheng and Wang (2012) ²²	China	To investigate knowledge of and attitudes toward perimenopause in spouses and children	100 husbands and 100 children of perimenopausal women aged 45–55 years	Cross-sectional	Self-designed questionnaire: knowledge and attitude toward women's perimenopause	A total of 30% of husbands had no knowledge of menopause, and 38% knew a little; 65% husbands could not understand their wives changes, and 75% were unable to even tolerate them
Aksu et al. (2011) ²³	Turkey	To investigate the attitudes of couples toward menopause and the relationship between attitudes and menopause symptoms and depression and anxiety scores	60 couples with women in the perimenopausal period	Cross-sectional	Demographics Menstrual status MRS ATMS BDI BAI	All women had moderate perimenopausal symptom scores. The average ATMS score of husbands was 42.43 ± 10.94 . The ATMS score of the husbands was negatively correlated with the total MRS score ($r = -0.03$, $p = 0.02$), somatic symptoms ($r = -0.27$, $p = 0.05$), and urogenital symptoms ($r = -0.32$, $p = 0.018$), but had no correlation with mental health

(continued)

Table 1. Continued.

Author (year)	Country	Purpose	Participants	Research design	Data collection method	Main results
Szpak et al. (2010) ²⁴	Poland	To investigate the relationships of couples in the menopausal period	40 couples with women aged 40–55 years with menopausal symptoms	Cross-sectional	Demographics Self-designed questionnaire: menstrual status, sexual life, HRT, and attitudes of men toward menopause SWM SKAT GREEN Scale	In total, 58% of men understood and were willing to support their perimenopausal wives, and 75% were willing to accept perimenopausal changes. More than 75% of men said their partners were still attractive to them, and 40% said they still had good sex lives, but 23% of men said sex made them feel uncomfortable. A total of 1/3 men thought that perimenopause was a personal problem for women, 20% of men thought that it was difficult to bear the perimenopausal changes of women, and they were unwilling to contact with the women. Husbands knew little about wives' menstrual statuses. The average MAS score of men was 74.66 ± 17.38 . Wives' attitudes toward perimenopause were positively correlated to husbands' attitudes ($r = 0.22, p < 0.01$) and negatively correlated to husbands' perceptions of the frequency of menopausal symptoms ($r = -0.17, p < 0.05$). Husbands' attitudes were negatively correlated with wives' self-reported symptoms ($r = -0.19, p < 0.05$) and husbands' perceptions of wives' symptoms ($r = -0.22, p < 0.01$). Menopausal symptoms reported by women could predict both male and female attitudes toward menopause ($\beta = -0.214, p < 0.01; \beta = -0.25, p < 0.01$). Men lacked knowledge about perimenopause and learned about menopause through living with and sharing experiences with their wives. Men could recognize their wives' emotional changes and some of their emotional needs, but they did not know how to support them. The coping methods adopted by men were aimed at adjusting the marital relationship, and men hoped to obtain menopause-related knowledge, emotional support, and guidance. Men suggested that the quality of women's health care during menopause should be improved.
Papini et al. (2002) ²⁵	USA	To examine the relationship of menopausal attitudes of couples with the frequency of menopausal symptoms at midlife	169 couples with women aged 38–60 years in the perimenopausal period	Cross-sectional	Demographics Menstrual status IMAS MCS	Half of Muslim men had strong religious awareness of menstruation. Men knew little about menopause and HRT. Men could recognize menopausal symptoms (such as weight gain, mood swings, changes in sexual function, and menstrual changes) but could not understand their wives' needs and expectations
Cacapava Rodolpho et al. (2016) ²⁶	Brazil	To explore men's perceptions of and attitudes toward their wives' experiences of natural menopause and to identify women's social support and health-care needs from men's perspectives	20 men who lived with their wives who were experiencing natural menopause for at least 5 years	Qualitative	Open-ended introductory questions Interviews	Menopausal symptoms reported by women could predict both male and female attitudes toward menopause ($\beta = -0.214, p < 0.01; \beta = -0.25, p < 0.01$). Men lacked knowledge about perimenopause and learned about menopause through living with and sharing experiences with their wives. Men could recognize their wives' emotional changes and some of their emotional needs, but they did not know how to support them. The coping methods adopted by men were aimed at adjusting the marital relationship, and men hoped to obtain menopause-related knowledge, emotional support, and guidance. Men suggested that the quality of women's health care during menopause should be improved.
Hidroglu et al. (2014) ²⁷	Turkey	To explore Turkish men's views on perimenopause	33 married men aged 40–77 years	Qualitative	Semi-structured interviews	Half of Muslim men had strong religious awareness of menstruation. Men knew little about menopause and HRT. Men could recognize menopausal symptoms (such as weight gain, mood swings, changes in sexual function, and menstrual changes) but could not understand their wives' needs and expectations

(continued)

Table 1. Continued.

Author (year)	Country	Purpose	Participants	Research design	Data collection method	Main results
Marinês et al. (2013) ²⁸	Brazil	To explore Brazilian men's views on perimenopause	10 spouses of perimenopausal women	Qualitative	Open interviews	Men had little knowledge about physical and psychological changes related to menopause. Hot flashes and irritability were usually recognized. Men strived to maintain relationships, but there was less sex. Men were unable to understand and cope with their wives' emotional fluctuations and had negative attitudes toward gaining knowledge. They hoped that their wives could receive HRT to improve their sexual function but not to improve their emotional problems
Mansfield et al. (2003) ²⁹	Canada	To explore men's support for and attitudes toward their perimenopausal wives, their knowledge levels, and their internal and external pressure during this period	96 husbands of perimenopausal women	Qualitative	Semi-structured interviews	Most men provided emotional support for their wives, but they knew little about menopause and learned about menopause mainly from their wives. Men were adversely affected by the menopausal transitions of their wives, especially regarding their marital relations and sex lives. Men were faced with internal and external factors such as physiological aging, emotional changes, family life, work pressure, and others, which may have been reasons for them providing less support for their wives
Solstad and Garde (1992) ³⁰	Denmark	To explore Danish middle-aged men's views on 'male menopause' and female menopause, and the impact of these views on menopausal women	504 Danish men aged 40 years; 100 were randomly selected to be interviewed when they were 51 years old	Mixed methods	Self-designed questionnaire: 'male menopause' and female menopause Serum luteinizing hormone and serum-free testosterone Semi-structured interviews	Men reported that their wives were or had been through perimenopause. Men who felt that perimenopause had a positive or no effect on them reported 'male menopause' significantly less. Men could often recognize wives' psychological symptoms and some physiological changes (such as hot flashes, headaches, weight gain, and decreased sexual desire), but they did not want to learn relevant knowledge about perimenopause and believed that 'male menopause' was affected by the perimenopause that their wives were experiencing

$p < 0.05$ indicates statistical significance. ATMS, Attitudes Towards Menopause Scale; BAI, Beck Anxiety Inventory; BDI, Beck Depression Inventory; GREEN Scale, a scale evaluating the intensification of menopausal symptoms; HRT, hormone replacement therapy; MAS, Menopause Attitude Scale; MCS, Menopausal Symptoms Checklist; MENQOL, Menopause-specific Quality of Life Questionnaire; MRS, Menopausal Rating Scale; QOL, quality of life; SDS, Self-rating Depression Scale; SKAT, Scale of Attractiveness; SWM, Marriage Bond Scale.

expressed more positive views about their wives' menopause, some men did not actually show the same degree of concern, which was reflected in the fact that they did not understand or were unwilling to accept the changes related to female menopause, thinking that this period was merely a part of life and that menopausal symptoms did not merit too much attention or require medical intervention. Some men even thought that menopause was a taboo topic and communicated very little with their wives.

Factors related to the perceptions and attitudes of spouses

Only Sun *et al.*²⁰ analyzed the factors related to male perceptions, and the results showed that knowledge of nutrition, diet, and health care differed significantly based on men's education level and monthly family income ($p < 0.05$). In addition, spouses' perceptions and attitudes seemed to be related to women's menopausal symptoms. Aksu *et al.*²³ demonstrated that men's ATMS scores were negatively correlated with women's total scores for menopausal symptoms, physical symptoms, and genitourinary symptoms ($r = -0.03$, $p = 0.02$; $r = -0.27$, $p = 0.05$; $r = -0.32$, $p = 0.018$), but they had no correlation with women's psychological symptoms. Papini *et al.*²⁵ reported that husbands' attitudes toward menopause were significantly positively correlated with their wives' attitudes ($r = 0.22$, $p < 0.01$), but were significantly negatively correlated with their wives' menopausal symptoms and their own perceptions of the severity of their wives' menopausal symptoms ($r = -0.19$, $p < 0.05$; $r = -0.22$, $p < 0.01$). Moreover, menopausal symptoms in women could also predict couples' attitudes toward menopause (men's attitude, $\beta = -0.214$, $p < 0.01$; women's attitude, $\beta = -0.25$, $p < 0.01$).

Results from qualitative evidence

Spouses misunderstand wives' menopause

Similar to the quantitative results, the results of the qualitative interviews showed that males had blind spots in their perceptions of female menopause. Men had different understandings of the causes of menopause, viewing it as a 'natural process', a 'disease', and 'fatalism'. Some men who held the 'natural process' view showed consistent cognition regarding menopause^{28,30}. In contrast, others thought that menopause was merely a normal and short phase of life and could not affect women's happiness and that their wives' menopausal symptoms and emotional reactions were merely an excuse to complain about life²⁶. However, men who viewed menopause as a 'disease' believed that changes in physical functioning during menopause reflected disease²⁷. Most of the misunderstandings surrounding menopause among men with 'fatalistic' views may have stemmed from religious beliefs^{27,30}.

Given their perceptions of menopausal symptoms, some men noted changes in their sexual lives with their wives, expressing that the frequency and quality of sexual activity had been reduced because of hot flashes and irritability in women^{26,27,30}. In addition, some spouses mentioned weight

changes in menopausal women²⁹. Most men knew little about treatments and health-care measures for menopause²⁷.

Spouses obtain information about menopause mainly through their wives

What husbands knew about menopause they had mostly learned from their wives. They mainly learned about menopause through living together and sharing experiences with their wives, and only a very small number of spouses had obtained knowledge from doctors or other health-care providers^{26,29}.

It is difficult for spouses to understand and cope with their wives' menopausal changes

Some spouses expressed no curiosity or interest in female menopause^{28,30}. Most men reported confusion about coping strategies and emotional support. Men always supported their wives by following their own feelings and opinions²⁶. They helped their wives to cope with menopausal symptoms through positive strategies, including trying to be sensitive to their wives' needs, being active listeners, and providing instrumental support²⁹. However, some spouses thought that non-intervention was the best support strategy, especially when their wives were experiencing emotional fluctuations^{26,28}.

Spouses' perceptions of and attitudes toward wives' menopause are related to internal and external factors

When women are experiencing the menopausal period, men themselves are gradually entering middle age; at the same time, many internal and external factors may affect their attitudes toward female menopause. Internal factors refer to men's own factors during their wives' menopause, including natural aging-related changes, diseases, psychological changes, lack of relevant knowledge, religious beliefs, and sociodemographic factors^{29,30}. Furthermore, three studies^{26,28,29} indicated that a lack of knowledge of menopause may have been an important reason why men could not understand their wives' menopausal symptoms or did not provide support for their wives. External factors mainly refer to the work, family, and life problems faced by men during their wives' menopause. Nearly half of spouses said they were under considerable pressure in life, and the main sources of pressure were work and financial problems, followed by family problems and the need to support parents²⁹. In addition, changes in women during menopause could also place significant pressure on spouses, and the most commonly influencing factors were mood fluctuations and sexual changes, which may result in marital strain^{26,28-30}.

Spouses have multiple needs during their wives' menopause

When women experienced menopause, their husbands had several kinds of needs. First, they had to learn about women's menopause. Husbands were reluctant to share information about the climacteric with others because they believed that it was a private problem, but they hoped to obtain

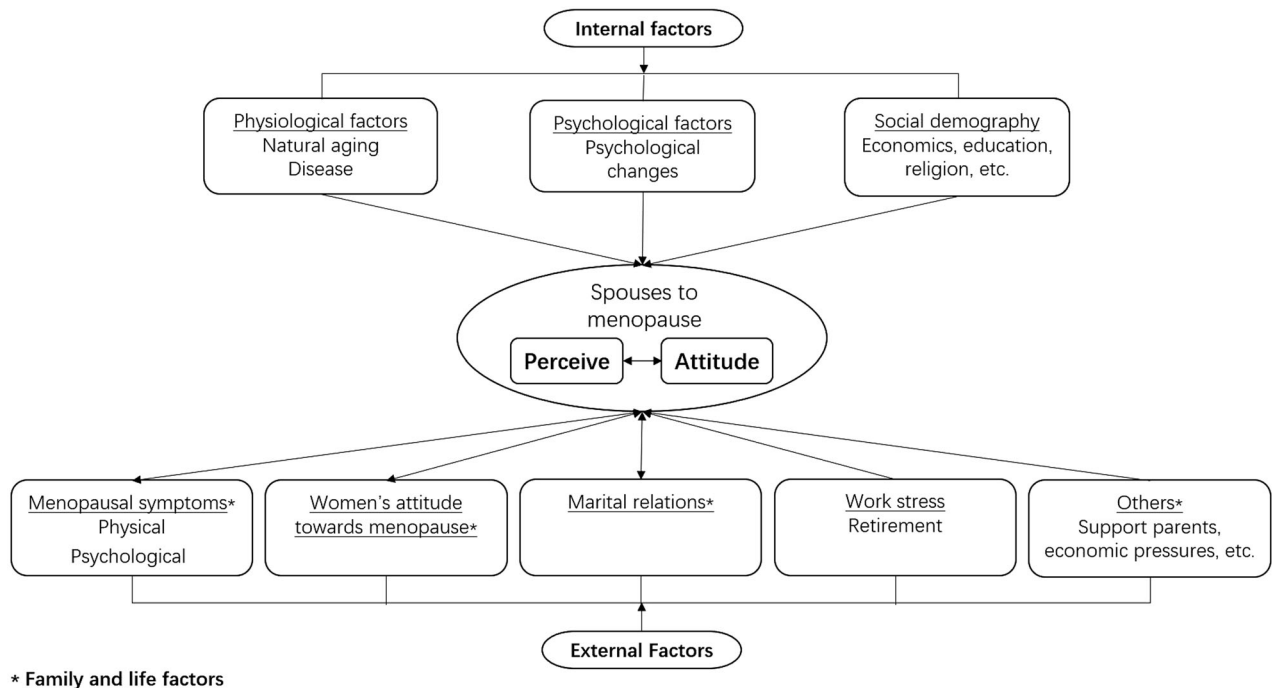


Figure 2. Factors that may be related to the spouses' perceptions of and attitudes toward their wives' menopause, according to this review.

information and support from medical institutions and health-care providers^{26,28}. Second, husbands wanted to obtain emotional support and emotional problem guidance to take appropriate methods to address mood swings in menopausal women and adjust marriage relationships. Finally, men suggested that the quality of women's health care during menopause should be improved²⁶.

Synthesis of quantitative and qualitative results

The quantitative and qualitative results were juxtaposed to explore the consistencies and contradictions between the results obtained by the two research methods. The comprehensive results mainly included the following aspects. First, husbands did not have adequate knowledge of menopause, menopausal symptoms, or the health-care status of their wives. From men's perspectives, the most recognizable menopausal changes in women were mood swings and sexual function changes. The quantitative results showed that the primary source of information for men was online media, while the qualitative results showed that men learned about menopause mainly from living with their wives. Second, men had different attitudes toward their wives' menopause. The results of the two methods suggested that some men with positive attitudes also did not know how to help their wives through menopause. Third, the quantitative studies showed that men's attitudes toward their wives' menopause seemed to be related to women's own attitudes toward menopause and its associated physical and psychological symptoms. The qualitative findings suggested that a number of internal and external factors in middle-aged male spouses may influence their perceptions of and attitudes toward menopause; meanwhile, both the qualitative and quantitative studies noted that the level of perceptions

themselves may also be an important factor affecting men's attitudes and support. Figure 2 summarizes the factors that were suggested to be related to men's perceptions of and attitudes toward female menopause in this review. Finally, the qualitative results indicated that during wives' menopause, husbands needed to acquire menopausal knowledge and to obtain emotional support and guidance from professional health providers, and they suggested that the quality of women's health care during menopause should be improved.

Discussion

The 12 studies included investigated the perceptions and attitudes of spouses, thereby providing a comprehensive understanding of men's subjective feelings and the related factors during their wives' menopausal periods. The search results showed that there is still a lack of direct investigation of the husbands of menopausal women, as well as a lack of an objective survey tool to measure men's perceptions and attitudes. Although two studies^{23,25} adopted the ATMS and the MAS to measure male attitudes, both scales were developed based on women and have been widely used to investigate women's attitudes toward menopause³³⁻³⁵. While these scales have good reliability and validity, their applicability in men still needs to be explored.

Many men still do not understand female menopause. Men can recognize some menopausal symptoms, among which changes in wives' moods and sexual function are the most noticeable. Islam *et al.*'s review³⁶ reported a higher incidence of depression and irritability in Asian menopausal women, and Gartoulla *et al.*³⁷ found similar results in Australian women. Women's emotional changes directly affect the way they get along with their husbands. Without

any knowledge of menopause, husbands often escape as a way to avoid conflicts. This situation has negative impacts on communication between couples and emotional support from husbands, which may affect marital relations and the development of psychological diseases in menopausal women. Nazarpour *et al.*³⁸ reported that women's changes in sexual function during menopause were affected by various psychological and social factors, which is an important female menopausal health problem and an important factor affecting marital relationships. Mirmolaei *et al.*³⁹ reported that communication counseling for menopausal women and their spouses could improve their sexual lives and communication. We also found in this review that male spouses needed to gain knowledge to address problems related to sex; thus, health providers should not ignore this issue.

Men's main sources of information about female menopause were online media and their wives, but most of them did not have the awareness to explore and learn about female menopause, which may be due to misunderstandings about menopause or the view that menopause is a private matter for women. Meanwhile, a lack of active communication between couples during wives' menopause was also shown^{26,28,29}. The online promotion of menopause-related education should be strengthened. Additionally, health-care providers should encourage men to learn about and participate in health care for women in menopause and promote communication between partners.

There were no studies exploring the impact of spouses' perceptions of and attitudes toward menopause on their supportive behaviors. In addition, some studies found that there was a difference in male support as self-reported by men and as perceived by women. That is, the way in which men provide support may not be effective for their wives, and future studies should focus on assessing the support that men actually provide and that their wives perceive.

The results also showed that spouses' perceptions and attitudes may affect women's menopausal symptoms, and, in contrast, women's attitudes toward menopause may be affected by their spouses' perceptions and attitudes^{21,23,25}. In addition, men's personal and external factors may also cause differences in their desires to learn about their wives' menopause and their attitudes toward it^{29,30}. However, due to limitations in research design, the existing studies could not determine the relationship between the influencing factors and spouses' perceptions and attitudes, so future studies should pay attention to this issue and provide more scientific evidence for the role of spouses in female menopause. At the same time, researchers should explore the internal and external factors that may influence men's perceptions and attitudes, and should provide effective strategies for improving levels of spousal support.

Moreover, it was mentioned in one included study that men are more willing to communicate with same-sex caregivers²⁷; thus, in the future, health-care providers can refer to this phenomenon and try to have male health experts communicate with male spouses to improve the effectiveness of support.

Conclusion

Male spouses are an important source of family and emotional support for menopausal women, and their perceptions and attitudes may be important factors affecting the level of support for menopausal women. Spouses have misconceptions about menopause, and they have different attitudes toward menopause, but most of them are unable to cope with their wives' menopause-related changes. In addition, limited studies have shown that men's perceptions of and attitudes toward menopause may be influenced by their own factors and family and work pressures. At the same time, men's perceptions and attitudes may have negative influences on their wives' menopausal symptoms, their wives' attitudes toward menopause, and their marital relationships, which still needs to be confirmed by further studies. Health-care institutions should pay more attention to the role of male spouses in women's menopause, encourage men to actively participate in menopausal health care for their wives, promote communication and interaction between partners, and provide enough knowledge and emotional support for men so that they can improve the levels of support they provide their wives and can help them through menopause smoothly.

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