



Knowledge, Attitudes, and Barriers Toward Exercise Among Women with Pregnancy-Related Pelvic Girdle Pain: A Cross-Sectional Study

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Abstract

Context: Pelvic Girdle Pain (PGP) is a common musculoskeletal problem in pregnancy, often leading to functional disability, impaired mobility, and reduced quality of life. Despite the well-established role of exercise in alleviating symptoms, there is limited understanding of how pregnant women perceive exercise for PGP in low resource settings.

Objective: This study aimed to identify the knowledge, attitudes, and barriers related to exercise among pregnant women with PGP.

Materials And Methods: A descriptive cross-sectional study was conducted among 84 pregnant women aged 20–35 years, between the 18th–27th weeks of gestation, recruited from antenatal clinics in hospital in North Bangalore using a convenience sampling technique. A structured questionnaire was used to assess demographic details, knowledge, perceptions, and barriers toward exercise from June 2024 to November 2024. Data were analysed using IBM SPSS Version 25.0. Descriptive statistics were used to summarise the data, and inferential statistical tests were performed to determine associations between categorical variables. A p-value of <0.05 was considered statistically significant.

Results: Of 84 pregnant women assessed (mean age 27.4 ± 3.1 years), only 4(4.8%) demonstrated awareness of pelvic girdle pain (PGP) as a distinct condition. Despite this knowledge gap, 95.2% expressed a favourable attitude toward physiotherapist-guided exercise. Fatigue, lack of time, limited guidance, and absence of healthcare-provider advice were key barriers.

Conclusion: Knowledge gaps regarding about awareness in PGP and the role of physiotherapy were identified, despite generally positive attitudes and willingness to exercise.

Keywords: Attitude to Health, pelvic girdle pain, Prenatal Care, Women's Health

Introduction

Pregnancy is a transformative phase in a woman's life, accompanied by a range of physiological and musculoskeletal adaptations. While these changes prepare the body for childbirth, they also predispose women to various musculoskeletal disorders, most notably Pelvic Girdle Pain (PGP). PGP is defined as pain experienced in the regions of the posterior iliac crest and the gluteal fold, often involving the sacroiliac

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articulations and symphysis pubis.¹ Symptoms may radiate to the thighs and may greatly limit everyday functioning such as standing, walking, and climbing stairs.¹

Worldwide, the prevalence of pregnancy-related PGP ranges from 23% to 65%⁶, making it one of the most commonly seen pregnancy-associated pain

syndromes. Despite its frequency, PGP is often underdiagnosed and underreported, particularly in low- and middle-income countries.² This is partly due to the perception that pain during pregnancy is a normal phenomenon.

The etiology of PGP is multifactorial, encompassing hormonal, biomechanical, and psychosocial contributors. Relaxin-mediated ligament laxity, increased lumbar lordosis, and mechanical overload from the growing fetus contribute to instability and pain in the pelvic girdle.³ The functional consequences include impaired mobility, reduced participation in physical activity, and increased risk of postpartum chronic pain.³

Exercise-based interventions, have been shown to alleviate pain, improve mobility, and enhance women's quality of life with PGP. Studies demonstrate that individually tailored, supervised exercise programs produce significant long-term benefits.⁵ However, adherence to exercise during pregnancy remains a challenge, influenced by women's knowledge, perceptions, cultural factors, and environmental barriers.⁷ In India, limited research exists on pregnant women's knowledge and attitudes toward exercise for PGP. While international guidelines advocate exercise as a first-line treatment for PGP, there remains a gap in translating these recommendations into routine antenatal care in developing countries.

Implementation of the study was to evaluate the knowledge, attitudes, and barriers of pregnant women toward exercise-based management for PGP in an Indian urban population. By addressing these factors, the findings aim to inform strategies for integrating physiotherapy into antenatal care, thereby promoting maternal health and reducing pregnancy-related disability.

The aim of this study was to assess the knowledge, attitudes, and perceived barriers toward exercise among pregnant women with pregnancy-related pelvic girdle pain, and to educate pregnant women on the importance of overcoming these barriers to promote safe and effective exercise performance.

Materials and Methods

Study Design

A descriptive, cross-sectional study was designed to explore the knowledge, attitudes, and barriers of pregnant women regarding exercise for Pelvic Girdle Pain (PGP). The research was implemented in

antenatal centre in Ramaiah memorial Hospital in North Bangalore, India, over a phase of six months from June 2024 to November 2024.

Study Population

The population under study comprised of pregnant women in their second trimester (18–27 weeks gestation). This phase was identified due to PGP commonly emerging or worsening during the mid-pregnancy phase, and functional disability becomes more evident too around this interval. Pregnant women between 20 and 35 years of age, with a gestational period of 18–27 weeks, who reported pelvic pain located between the iliac crest and the gluteal folds (with or without radiation to the thighs), and who provided consent to participate, were recruited into the study.

Participants were excluded if they had pre-existing orthopaedic or neurological disorders unrelated to pregnancy (such as lumbar disc herniation, sciatica, or Parkinson's disease), a history of traumatic injuries involving the spine or pelvis, or were classified as having a high-risk pregnancy, including conditions such as placenta previa, pre-eclampsia, or gestational diabetes requiring hospitalization. Women with severe cardiovascular, respiratory, or any other orthopedic conditions that may limit safe participation were also excluded from the study.

Sample Size determination and Sampling

Previous studies have reported the prevalence of pregnancy-related pelvic girdle pain (PGP) to range from approximately 23% to 65% among pregnant women.² An anticipated prevalence of 29.9% was selected based on prevalence estimates reported in Indian antenatal populations³ which falls within the broader international range of 23–65%,⁶ while remaining a conservative, context-appropriate estimate for an urban Indian cohort. Based on the anticipated prevalence of 29.9%,³ the required sample size for this cross-sectional study was calculated using the formula $n = Z^2 pq/d^2$, with a 95% confidence level and an absolute precision of approximately 10%, yielding a minimum sample size of approximately 80 participants. Participants were recruited using convenience sampling. During the study period from June 2024 to November 2024, 331 pregnant women attending antenatal care units were screened, of whom 87 were identified as having PGP. All eligible women were approached for

participation, and 84 completed the questionnaire and were included in the final analysis.

Study Instrument

A structured, self-administered questionnaire (Annexure 1) was developed following an extensive review of existing studies and validated by a panel of experts in women's health physiotherapy. The questionnaire consisted of four major components.

The first section gathered demographic information and maternal characteristics such as age, number of previous pregnancies, educational attainment, and occupational status, and residential background.

The second section assessed participants' knowledge related to pelvic girdle pain, including awareness of the condition, its distinction from general back pain, and awareness of physiotherapy-based management options. Knowledge was assessed using six separate dichotomous (Yes/No) items, each scored individually as 0 (No) or 1 (Yes), where a "Yes" response indicated correct awareness of that specific knowledge domain. Although these five binary items could theoretically be summed to yield a composite score ranging from 0 to 5, responses were instead analyzed and reported at the individual item level (Table 2), reflecting the proportion of participants demonstrating awareness for each specific knowledge domain. This approach was chosen over a composite score because it preserves clinically meaningful distinctions between awareness domains (e.g., general awareness of PGP as a condition vs. awareness of specific physiotherapy management options) that a single summed score would otherwise obscure.

The third section explored attitudes toward exercise and physiotherapy, focusing on perceptions of the physical activity and its uses during pregnancy and willingness to join in physiotherapy programmes. Attitudes toward exercise and physiotherapy were assessed using statements rated on a five-point Likert scale, ranging from strongly agree (1) to strongly disagree (5). The items evaluated participants' perceptions of physical activity during pregnancy and their willingness to participate in physiotherapy programmes. Some statements were positively framed. For them, lower scores indicated a more favourable attitude, while negatively worded items were reverse scored. Five items were positively framed, scored as presented; two negatively worded items (concern that exercise may cause harm, and

preference for rest over exercise) were reverse-scored, such that lower total scores consistently reflected a more favourable attitude across all items. A composite attitude score was calculated by summing all seven items following reverse-scoring, with a theoretical range of 7–35. The observed range in this sample was 12–21 (mean 17.5 ± 1.96 , median 17), indicating that responses were concentrated toward the favourable end of the scale.

The final section examined barriers to participation in exercise, including factors such as limited time, fatigue, concerns about fetal safety, lack of recommendations from healthcare providers, and insufficient physiotherapy guidance. These items were rated on a five-point Likert scale. As with the knowledge items (Table 2) and demographic variables (Table 1), barrier items were reported descriptively at the individual item level, as frequencies and percentages for each response category (Table 4), rather than combined into a composite barriers score, to preserve the specific contribution of each individual barrier to the overall picture.

The tool underwent pretesting in a subset of 10 participants in the antenatal centre. Ten was decided since the final sample size was 84. A minimum of 10% of the final sample size was considered adequate for the pre-test. These 10 were not included in the main study to ensure clarity and reliability. The questionnaire underwent pilot testing in a subset of 10 participants to assess clarity, comprehensibility, and feasibility. Content and face validity were established through review by subject experts in physiotherapy and obstetrics. Formal reliability testing was not performed as the pilot was intended to refine item clarity. Minor revisions were implemented before full-scale administration.

Study Procedure

Participants who were eligible were selected and approached during their scheduled antenatal consultations. After obtaining informed consent, the purpose and requirements of the study were explained to each participant. The questionnaire was then administered onsite, with the researcher available throughout the process to facilitate understanding and address any questions, thereby ensuring completeness and accuracy of the responses.

Ethical Considerations: The study proposal was

given ethical clearance from Institutional Board of Ramaiah Medical college- ***/AP/07/02-2022 (This number stands for the Institutional Ethics Committee registration ID). Informed written consent was obtained from all who were participating, ensuring confidentiality and voluntary participation. Participants experiencing severe pain were referred for physiotherapy management as part of ethical responsibility.

Data Analysis

Analysis of recorded data was done using SPSS Version 25.0. Descriptive statistics (mean, standard deviation, frequency, and percentages) were calculated for quantitative and categorical variables. Associations between categorical sociodemographic variables and awareness of PGP were assessed using the chi-square test. Where more than 20% of cells had an expected frequency of less than 5, Fisher's exact test (for 2×2 tables) or the Fisher–Freeman–Halton exact test was used instead, in accordance with standard recommendations for small or sparse samples.

A p-value of < 0.05 was accepted as statistically significant.

Results

Participant Characteristics

Collectively 84 women participated, with an average age of 27.4 years ($SD \pm 3.1$). Most participants were multiparous (62%), housewives (58%), and from urban areas (61%). Regarding education, 8.3% had completed graduation, while 91.7% had completed only secondary school. On knowledge of PGP, only 4.8% ($n=4$) of women recognized PGP as a specific condition distinct from general back pain. The

Table 1: Demographic Characteristics of Respondents

Demographic data		Frequency	Percent
Age	≤ 25 years	25	29.8
	> 25 years	59	70.2
Place of residence	Rural	4	4.8
	Urban	80	95.2
Marital status	Married	84	100.0
	Housewife	74	89.3
Occupation	Officer	8	8.3
	Others	2	2.4
	Degree	8	8.3
Educational qualification	Secondary school	76	91.7

majority 95.2% ($n=80$) perceived pelvic pain as a normal consequence of pregnancy

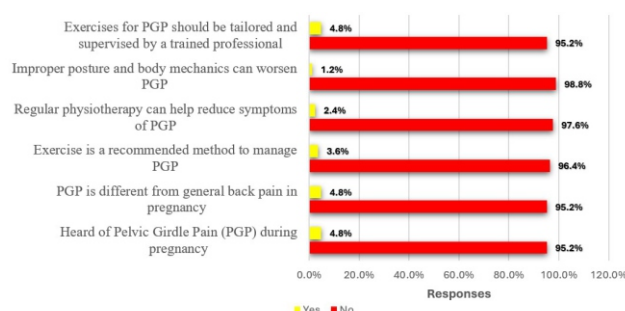


Fig 1: Knowledge of participants with PGP on exercise

Graph 1: The graph shows the knowledge of participants with PGP on exercise

Table 2: Distribution of Participants based on their Knowledge Regarding Pregnancy-Related Pelvic Girdle Pain and exercise

Variables	No n(%)	Yes n(%)
Heard of Pelvic Girdle Pain (PGP) during pregnancy	80(95.2%)	4(4.8%)
PGP is different from general back pain in pregnancy	80(95.2%)	4(4.8%)
Exercise is a recommended method to manage PGP	81(96.4%)	3(3.6%)
Regular physiotherapy can help reduce symptoms of PGP	82(97.6%)	2(2.4%)
Improper posture and body mechanics can worsen PGP	83(98.8%)	1(1.2%)
Exercises for PGP should be tailored and supervised by a trained professional	80(95.2%)	4(4.8%)

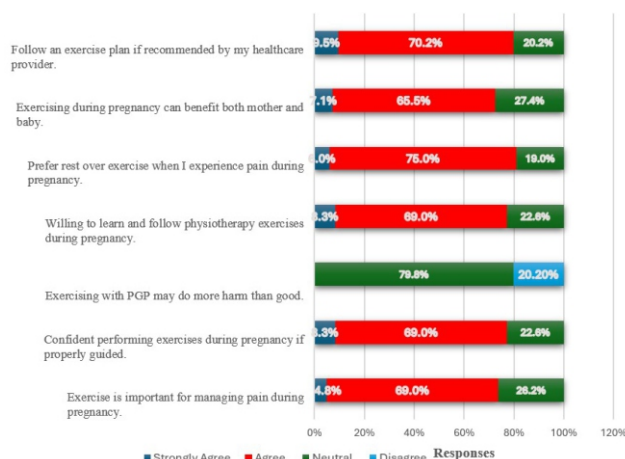
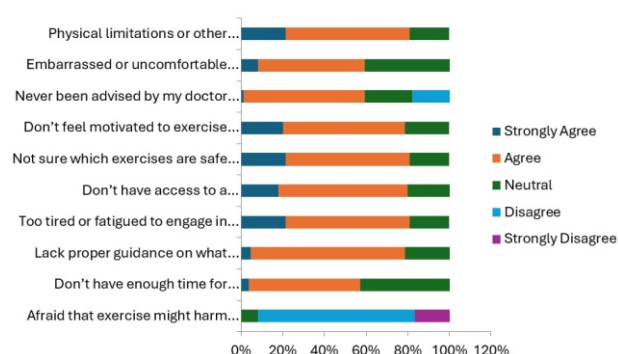


Fig 2: Attitudes of pregnant patients with PGP towards exercise

Graph 2: The graph shows the attitude of participants with PGP towards exercise

Table 3: Respondents's Attitude towards Exercises

Variables	Strongly agree n(%)	Agree n(%)	Neutral n(%)	Disagree n(%)
Exercise is important for managing pain during pregnancy.	4(4.8%)	58(69.0%)	22(26.2%)	0(0%)
Confident performing exercises during pregnancy if properly guided.	7(8.3%)	58(69.0%)	19(22.6%)	0(0%)
Exercising with PGP may do more harm than good.	0(0%)	0(0%)	67(79.8%)	17(20.2%)
Willing to learn and follow physiotherapy exercises during pregnancy.	7(8.3%)	58(69.0%)	19(22.6%)	0(0%)
Prefer rest over exercise when I experience pain during pregnancy.	5(6.0%)	63(75.0%)	16(19.0%)	0(0%)
Exercising during pregnancy can benefit both mother and baby.	6(7.1%)	55(65.5%)	23(27.4%)	0(0%)
Follow an exercise plan if recommended by my healthcare provider.	8(9.5%)	59(70.2%)	17(20.2%)	0(0%)

**Fig 3: Barriers of participants with PGP towards exercise**

Graph 3: The graph shows the barriers of pregnant clients towards exercise

Table 4: Barriers to use of exercise by pregnant women in second trimester of Gestation

Variables	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Afraid that exercise might harm my baby.	0(0%)	0(0%)	7 (8.3%)	63 (75.0%)	14 (16.7%)
Don't have enough time for regular exercise during pregnancy.	3(3.6%)	45 (53.6%)	36 (42.9%)	0(0%)	0(0%)
Lack proper guidance on what exercises are safe.	4(4.8%)	62 (73.8%)	18 (21.4%)	0(0%)	0(0%)
Too tired or fatigued to engage in exercise.	18 (21.4%)	50 (59.5%)	16 (19.0%)	0(0%)	0(0%)
Don't have access to a physiotherapist or prenatal exercise programs.	15 (17.9%)	52 (61.9%)	17 (20.2%)	0(0%)	0(0%)
Not sure which exercises are safe for PGP.	18 (21.4%)	50 (59.5%)	16 (19.0%)	0(0%)	0(0%)
Don't feel motivated to exercise during pregnancy.	17 (20.2%)	49 (58.3%)	18 (21.4%)	0(0%)	0(0%)
Never been advised by my doctor to do exercises for PGP.	1(1.2%)	49 (58.3%)	19 (22.6%)	15 (17.9%)	0(0%)
Embarrassed or uncomfortable doing exercises in public or group settings.	7(8.3%)	43 (51.2%)	34 (40.5%)	0(0%)	0(0%)
Physical limitations or other medical conditions preventing me from exercising.	18 (21.4%)	50 (59.5%)	16 (19.0%)	0(0%)	0(0%)

Despite of barriers to exercise in pregnancy, the majority of participants (95%, n = 80) demonstrated a positive attitude toward exercise and physiotherapy, as indicated by their responses to the attitude section (Q11–Q17) of the questionnaire. Most participants (88%) expressed willingness to engage in exercise programs if recommended by their obstetrician or physiotherapist.

Barriers to Exercise

Several factors were reported as obstacles to engaging in regular physical activity during pregnancy. Fatigue emerged as the most frequently cited barrier (72%). This was followed by limited time, largely due to household and caregiving responsibilities (65%). A considerable proportion of participants expressed concerns about potential harm to the baby (47%), which contributed to hesitancy toward exercise. Additionally, many women reported receiving insufficient advice or encouragement from healthcare providers (45%). The lack of accessible physiotherapy services in their vicinity was also noted as a significant barrier by 39% of the respondents. Housewives reported time and fatigue as key barriers, while working women more frequently cited lack of access to physiotherapy.

Table 5: Association Between Sociodemographic Characteristics and Awareness of Pelvic Girdle Pain (n = 84)

Variable	Category	Aware n(%)	Not Aware n(%)	p-value
Education	Degree	4 (50.0%)	4 (50.0%)	<0.001
	Secondary school	0 (0.0%)	76 (100%)	
Occupation	Officer	4 (50.0%)	4 (50.0%)	<0.001
	Housewife	0 (0.0%)	74 (100%)	
	Others	0 (0.0%)	2 (100%)	
Age	≤25 years	1 (4.0%)	24 (96.0%)	1.000
	>25 years	3 (5.1%)	56 (94.9%)	
Residence	Urban	4 (5.0%)	76 (95.0%)	1.000
	Rural	0 (0.0%)	4 (100%)	

Statistical analysis pointed out that traits such as educational status demonstrated significant associations with awareness of PGP ($p < 0.05$). However, age and residence (urban/rural) did not show any significant association with awareness. ($p > 0.05$)

Discussion

Pelvic Girdle Pain (PGP) is a common musculoskeletal issue during pregnancy, yet its

recognition remains limited in many cultural contexts.⁸ In this study, only 4.8% of participants demonstrated awareness of physiotherapy interventions for PGP, highlighting a critical knowledge gap. This finding aligns with previous studies in Asian countries where PGP is often perceived as a normal pregnancy discomfort and is rarely addressed through structured physiotherapy.¹⁵

In contrast, studies from Western countries report higher awareness levels, likely due to established antenatal education programs and integration of physiotherapy within maternity care.^{5,24}

Despite limited awareness, attitudes toward exercise and physiotherapy were positive, with 95% of participants agreeing that professional guidance would make exercise beneficial. This mirrors findings from Vleeming et al.⁶ and Wu et al.,¹ which demonstrated that education combined with tailored exercise programs significantly improves functional outcomes and reduces PGP intensity. The positive attitude observed in this study suggests a strong readiness for behaviour change among pregnant women when appropriate guidance is provided.

In contrast, studies from low- and middle-income countries indicate that attitudes may be influenced by cultural beliefs and lack of professional guidance. For example, research from Indonesia and Nepal reported that although women recognized the benefits of physical activity, fear of foetal harm and uncertainty about safe exercises led to hesitancy in participation.^{29,30} This suggests that positive attitudes observed in our cohort are significant because they reflect intrinsic motivation and openness to behaviour change, despite minimal prior exposure to physiotherapy information.

Furthermore, the observed positive attitude is consistent with findings Dos Reis Monteiro (2017) who reported that women with prior counselling on antenatal exercise demonstrated higher intention to perform exercises regularly.³¹ Our study reinforces this concept by indicating that when proper guidance is available, pregnant women are likely to engage in physiotherapy interventions, creating a valuable window for healthcare providers to implement targeted education and supervised exercise programs. These findings highlight the importance of structured antenatal counselling in translating positive attitudes into actual practice, particularly in settings where awareness of PGP remains low.

Although only a minority of women practiced

exercise, the preference for low-impact activities such as walking, pelvic floor exercises, and breathing techniques indicates an inherent acceptance of safe, pregnancy-appropriate physical activity. This finding underscores the relevance of the study topic by highlighting the value for structured antenatal exercise education, physiotherapist-guided interventions, and family-inclusive counselling to improve exercise adherence during pregnancy.¹⁸

Education emerged as a significant predictor of awareness. Awareness of PGP was found to be significantly associated with both educational qualification and occupational status ($p < 0.001$ for each). All four participants who reported awareness of PGP were degree-educated women employed in an officer-level occupation; none of the 76 women with secondary-school-level education, and none of the 74 housewives, reported awareness. Women with higher levels of education had better understanding and had increased likelihood to consider physiotherapy¹⁹, consistent with reports from European studies.¹⁹ Occupation also played a role, with working women demonstrating greater awareness, possibly due to increased exposure to health resources.²¹

This study elucidates several important implications clinically for improving the therapy of pelvic girdle pain during antenatal phase. Incorporating physiotherapy within routine antenatal care through structured educational sessions may enhance women's understanding of pelvic health and available treatment options.²² Strengthening collaboration between obstetricians and physiotherapists is also essential, as consistent referral pathways can ensure timely assessment and intervention for women reporting pelvic discomfort. Additionally, exercise programs should be tailored to address specific functional impairments²³—such as pelvic instability, reduced proprioception, and movement dysfunction—rather than relying solely on generalized antenatal exercise routines.²⁴ Expanding physiotherapy services among community based health centres will decrease access barriers related to distance, cost, and availability.²⁵ Finally, technology-based approaches, including mobile applications and tele-rehabilitation platforms, hold promise for supporting pregnant women who are unable to attend in-person sessions, thereby promoting continuity of care.

In line with studies in Europe, reporting of PGP prevalence rates up to 45% during mid-pregnancy, with physiotherapy widely recognized as beneficial is noted.²⁴ In contrast, research from Asia, including India, is limited, with cultural norms influencing care-seeking behavior. This study therefore fills an important gap by documenting barriers specific to Indian women.

Limitations

The study was subject to certain limitations. The sample was limited to urban clinics in Bangalore, which may not represent rural populations. Self-reported data may be influenced by recall inaccuracies. Additionally, the cross-sectional design does not measure long term changes in knowledge or pain severity.

Future research should include longitudinal study designs to track functional outcomes across pregnancy trimesters. Randomized controlled trials are further required to test the effectiveness of tailored exercise programs, including technology-assisted approaches such as Virtual Reality.

Conclusion

Our findings reveal the significant knowledge gaps, positive attitudes, and prevalent barriers regarding exercise for Pelvic Girdle Pain among pregnant women in India. Knowledge of PGP was alarmingly low, with most women perceiving pelvic discomfort as a normal part of pregnancy. Nevertheless, there was a strong willingness to adopt exercise-based interventions if provided with professional guidance.

Key barriers included fatigue, time constraints, cultural misconceptions, and lack of physiotherapy access, particularly the absence of referral from obstetricians. Patient education and occupation were significantly associated with knowledge and attitudes, suggesting that tailored health education strategies could improve recognition and management of PGP.

The findings underscore the urgent need to integrate physiotherapy into antenatal care. Structured education sessions, collaboration between women health physiotherapists and obstetricians, and community-based interventions could reduce the gaps in perception in pregnancy. Moreover, technology-driven approaches like tele-rehabilitation and Virtual Reality could provide

scalable, patient-friendly solutions for long-term management.

By addressing both knowledge and barriers, healthcare systems in developing countries can improve maternal well-being, enhance mobility, and reduce the functional disability associated with PGP. Ultimately, such efforts can lead to better pregnancy outcomes and improved quality of life for women.

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