

Korelasi dan Pengalaman Kepatuhan Latihan Aerobik pada Perempuan Menopause di Indonesia: Studi Metode Campuran Menggunakan Model Pender

Correlates and Lived Experiences of Aerobic Exercise Adherence Among Indonesian Menopausal Women: A Mixed-Methods Study Using Pender's Model

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Abstrak

Kepatuhan latihan aerobik pada perempuan menopause dipengaruhi oleh faktor personal, interpersonal, dan situasional, tetapi bukti dari Indonesia masih terbatas. Penelitian ini bertujuan menguji hubungan konstruk Health Promotion Model (HPM) Pender dengan komitmen pada rencana latihan aerobik serta mengeksplorasi pengalaman perempuan menopause Indonesia dalam mematuhi latihan tersebut. Penelitian menggunakan desain metode campuran. Pada tahap kuantitatif, 153 perempuan di Palembang mengisi kuesioner 19 butir berbasis HPM dan dianalisis dengan korelasi Pearson. Pada tahap kualitatif, 20 perempuan diwawancarai dan transkrip dianalisis secara tematik dengan panduan HPM. Efikasi diri memiliki korelasi terkuat dengan komitmen ($r = 0,66$; $p < 0,001$), diikuti pengaruh interpersonal ($r = 0,49$) dan manfaat yang dirasakan ($r = 0,33$); hambatan yang dirasakan ($r = 0,12$) dan tuntutan yang bersaing ($r = -0,08$) tidak berhubungan signifikan dengan komitmen. Wawancara menghasilkan tujuh tema. Perempuan memahami manfaat olahraga, tetapi terhambat oleh pengasuhan lintas generasi, pekerjaan rumah tangga, gejala menopause, dan kegiatan sosial-keagamaan. Dukungan keluarga bersifat pasif dan bersyarat, sedangkan teman sebaya aktif saling menyemangati. Olahraga terutama dilakukan pada hari Minggu dan hari libur serta saat ada instruktur atau teman, sehingga kepatuhan bergantung pada kesempatan, bukan kebiasaan mandiri. Penguatan efikasi diri dan senam kelompok yang dipandu instruktur dengan dukungan teman sebaya merupakan sasaran yang menjanjikan bagi program yang dipimpin perawat. Temuan ini berasal dari satu kota dan korelasi potong lintang sehingga tidak dapat menyimpulkan sebab-akibat.

Kata kunci: latihan aerobik, kepatuhan, menopause, efikasi diri, model promosi kesehatan.

Abstract

Aerobic exercise adherence among menopausal women is shaped by personal, interpersonal, and situational factors, yet evidence from Indonesia is limited. This study aimed to examine the associations of Pender's Health Promotion Model (HPM) constructs with commitment to an aerobic exercise plan and to explore the lived experiences behind adherence among Indonesian menopausal women. A mixed-methods design was used. In the quantitative strand, 153 women in Palembang completed a 19-item HPM-based questionnaire, and Pearson correlations were computed. In the qualitative strand, 20 women were interviewed, and the transcripts were analysed thematically, guided by the HPM. Self-efficacy shows the strongest correlation with commitment ($r = 0.66$, $p < 0.001$), followed by interpersonal influences ($r = 0.49$) and perceived benefits ($r = 0.33$); perceived barriers ($r = 0.12$) and competing demands ($r = -0.08$) are not significantly related to commitment. The interviews yield seven themes. Women understand the health value of exercise but are constrained by multigenerational caregiving, household duties, menopausal symptoms, and communal religious and social obligations. Family support is passive and conditional, whereas peers actively encourage one another. Exercise occurs mainly on Sundays and holidays and when an instructor or companions are available, so adherence is opportunity-dependent rather than self-sustained. Strengthening self-efficacy and offering instructor-led group exercise with peer support appear to be promising targets for nurse-led programmes. These findings come from a single city and cross-sectional correlations, so causal inference is not possible.

Keywords: aerobic exercise, adherence, menopause, self-efficacy, health promotion model.

1. INTRODUCTION

Menopause marks the end of a woman's reproductive years and is one point in a continuum of life stages rather than an isolated event. Its hormonal changes can affect physical, emotional, mental, and social well-being: hot flushes, night sweats, sleep difficulty, and mood changes are common, and the decline in oestrogen also affects body composition, cardiovascular risk, and bone density (1). The number of women living through or beyond menopause is growing. Worldwide, women aged 50 years and over made up 26% of all women and girls in 2021, up from 22% ten years earlier, and a woman aged 60 years in 2019 could expect to live about another 21 years on average (1). Many women will therefore live for two decades or more beyond the menopausal transition, which makes the health behaviours they adopt during and after this period a practical priority for nursing and primary care.

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DOI : 10.35451/jkf.v9i1.4081

Received : 2026-10-19, Accepted: 2026-10-23, Published: 2026-10-30

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Regular physical activity is widely recommended as a self-management strategy for this life stage. An overview of systematic reviews found some evidence that exercise may relieve certain menopausal symptoms, although it also noted that women may become less active during the menopausal transition (2). Among middle-aged Chinese women, a higher level of physical activity was strongly and inversely correlated with the severity of menopausal symptoms (3). Exercise is therefore an option that nurses can promote in community settings, but only if women take it up and keep doing it.

Sustained participation is a particular concern in Indonesia. The 2023 Indonesian Health Survey (Survei Kesehatan

n Indonesia, SKI) found that 37.4% of residents aged 10 years and older were insufficiently physically active; this national figure is not specific to menopausal women. Reasons given for inactivity included lack of time (48.7%), laziness (32.6%), old age (19.5%), and lack of a companion (9.8%) (4), which point to time, motivation, and social circumstances rather than to a lack of knowledge alone. In addition, Indonesia has no stand-alone national physical activity action plan or national physical activity guidelines; the promotion of physical activity is instead integrated into various health and sport regulations (5). Whether existing community programmes reach and suit menopausal women is not well documented, so nurses working in primary care and community settings have limited local evidence on which to base exercise programmes for this group.

Knowing that exercise is beneficial, however, does not ensure that women sustain it. Explaining why some women keep exercising while others do not requires attention to personal, interpersonal, and environmental influences. A systematic review using a socioecological lens identified existing health complaints as intrapersonal barriers, and awareness of health benefits and social support as enablers (6). Pender's Health Promotion Model (HPM) offers a nursing framework for this question. It proposes that behaviour-specific cognitions and affect (perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, and interpersonal and situational influences) shape commitment to a plan of action, which in turn leads to health-promoting behaviour, whereas immediate competing demands and preferences can disrupt that plan (7).

The model has been applied to women's physical activity. HPM constructs predicted physical activity among women in Iran (8), HPM-based exercise training has been tested for menopausal symptoms (9), and in Indonesia self-efficacy and social support have been linked to physical activity among middle-aged and older adults (10). Evidence on the effectiveness of the model in adults has also been synthesised (11). However, these studies focused on physical activity in general or on intervention effects. Evidence that combines HPM-guided correlations with menopausal women's own accounts of aerobic exercise adherence appears to be scarce, particularly in Indonesia.

Caring responsibilities add a further dimension. A qualitative study of caregiving grandparents described how personal, interpersonal, and environmental determinants shape their physical activity (12). Indonesian menopausal women may combine household, family, social, and religious obligations, so that exercise competes with many other demands on their time. How HPM cognitions relate to commitment to an aerobic exercise plan in this setting, and how women themselves describe the obstacles and facilitators, remain unclear.

Understanding what sustains aerobic exercise in this group is therefore urgent for two reasons. First, the number of women entering and living beyond menopause is rising [1], while insufficient physical activity is already common in Indonesia [4]. Second, without evidence on which constructs are most closely related to commitment, and on how women experience them in daily life, nurse-led programmes risk emphasising information about benefits when other factors, such as confidence or companionship, may matter more. A mixed-methods design suits this question because correlations show which constructs are associated with commitment, and interviews help to explain why.

This study therefore aimed to (1) examine the associations of HPM constructs with commitment to an aerobic exercise plan and adherence, and with competing demands, among Indonesian menopausal women, and (2) explore their lived experiences of aerobic exercise adherence, in order to inform the development of a nurse-led wellness intervention (MENO-CERIA).

2. METHODS

2.1 Materials

Quantitative strand. The quantitative strand included 153 menopausal women in Palembang, South Sumatra, Indonesia. Women aged 45–65 years were eligible if they had experienced natural menopause (no menstruation for at least 12 consecutive months), had lived in Palembang for at least one year, could communicate in Bahasa Indonesia, and agreed to take part voluntarily. Women who reported severe cognitive impairment or acute medical conditions that could interfere with completing the questionnaire were excluded. Of 156 women invited, three were excluded because their questionnaires were incomplete (some items were left unanswered), leaving 153 women with complete data.

Qualitative strand. Twenty menopausal women (coded P01–P20) were interviewed about their experiences of aerobic exercise adherence. They were selected to provide diverse perspectives relevant to the development of the MENO-CERIA intervention. The qualitative strand was conducted in Palembang, South Sumatra, Indonesia, across community settings such as local primary health centers (Puskesmas), community integrated health posts (Posyandu Lansia), and community gymnastics groups (Prolanis). Participants were recruited using a purposive sampling strategy to ensure maximum variation in terms of age, educational background, employment status, and exercise adherence habits. This sampling approach was chosen to capture diverse socio-cultural perspectives and rich, lived experiences relevant to the contextualization and development of the MENO-CERIA wellness intervention.

2.2 Instruments

The quantitative data were collected with a self-administered questionnaire developed by the research team from the HPM and administered in Bahasa Indonesia. The questionnaire is registered as a copyrighted work with the Directorate General of Intellectual Property, Ministry of Law of the Republic of Indonesia (registration no. EC002026115257, 15 July 2026). Part I recorded age, education, employment status, monthly household income, and prior exercise history. Part II measured behaviour-specific cognitions with 11 items rated from 1 (strongly disagree) to 5 (strongly agree): perceived benefits (3 items), perceived barriers (3 items), perceived self-efficacy (2 items), and interpersonal and situational influences (3 items). Part III measured commitment to a plan of action and adherence (3 items; fixed weekly schedule, consistency over the previous month, and prioritising exercise over leisure). Part IV measured competing demands and preferences (5 items; family care, household responsibilities, social commitments, religious activities, and preference for sedentary activities) rated from 1 (never) to 5 (always). Activity-related affect was not measured. The content validity index has not yet been assessed. Item validity was supported by corrected item–subscale correlations of 0.24 to 0.82, all above the critical value ($r = 0.159$, $n = 153$, $\alpha = 0.05$). Internal consistency was good for perceived benefits ($\alpha = 0.85$), self-efficacy (Spearman-Brown = 0.84), and commitment ($\alpha = 0.86$), acceptable for perceived barriers ($\alpha = 0.78$) and interpersonal influences ($\alpha = 0.74$), and borderline for competing demands ($\alpha = 0.68$). The full questionnaire is given in Supplementary File 1.

2.3 Procedure

Design and data collection. The study used a mixed-methods design combining a descriptive, correlational, cross-sectional survey with a qualitative inquiry; the two sets of findings were compared within each HPM construct during interpretation (triangulation). Questionnaires were collected between June and August 2026. Data were collected through face-to-face, in-depth individual interviews (one-on-one) with each participant. All interviews were conducted in Bahasa Indonesia, the primary language spoken by the participants, to ensure comfort and clarity in sharing their experiences. The duration of each interview session ranged between 30 and 50 minutes. With the participants' explicit informed consent, all interview sessions were audio-recorded. Following the completion of the interviews, the audio recordings were transcribed verbatim and subsequently imported into QualCoder software for systematic data management and analysis.

Data analysis. Quantitative data were analysed in jamovi (13). Scale scores were calculated as the sum of item responses, with higher scores indicating more of the construct. Pearson product–moment correlations were computed among the six constructs (two-tailed, $\alpha = 0.05$, no adjustment for multiple comparisons). Interview data were analysed by thematic analysis (14), guided by the HPM constructs. The verbatim transcripts imported into QualCoder were systematically analyzed following Braun and Clarke's six-phase thematic analysis

framework, deductively guided by Pender's Health Promotion Model (HPM) constructs while allowing inductive subthemes to emerge naturally. Initial codes were generated line-by-line from the raw transcripts, which were then iteratively organized, collated, and synthesized into broader subthemes and core themes reflecting the participants' challenges and adherence experiences.

To ensure qualitative rigor and trustworthiness, Lincoln and Guba's criteria were rigorously applied:

Credibility: Achieved through prolonged engagement during in-depth interviews and member-checking, wherein preliminary findings and theme summaries were returned to selected participants to confirm accurate interpretation of their responses.

Dependability: Maintained by establishing a comprehensive audit trail that documented every analytical step, coding scheme modifications, and thematic decisions made within QualCoder.

Confirmability: Ensured through peer debriefing sessions among the research team to continuously reflect upon and evaluate interpretations, thereby minimizing individual researcher bias.

Transferability: Facilitated by providing a thick description of the study setting, socio-demographic characteristics of the participants, and the socio-cultural context of menopausal women in Palembang.

Ethical considerations. Ethical approval was granted by the Komisi Etik Penelitian Kesehatan (KEPK) Universitas Prima Indonesia (approval no. 136/KEPK/UNPRI/V/2026, 29 May 2026). Informed consent was obtained from all participants after the procedure had been explained. Participation was voluntary, and responses were anonymous.

3. RESULTS

3.1 Correlations among HPM constructs

Table 1 shows that commitment to a plan of action and adherence correlated strongly with perceived self-efficacy ($r = 0.66, p < 0.001$), moderately with interpersonal and situational influences ($r = 0.49, p < 0.001$), and positively with perceived benefits ($r = 0.33, p < 0.001$). Perceived barriers ($r = 0.12, p > 0.05$) and competing demands ($r = -0.08, p > 0.05$) were not significantly related to commitment. Perceived benefits, self-efficacy, and interpersonal influences were also positively intercorrelated ($r = 0.41$ – 0.57 , all $p < 0.001$), whereas perceived barriers were unrelated to these constructs ($r = 0.06$ – 0.12). Competing demands were weakly and positively correlated with perceived barriers ($r = 0.18, p < 0.05$) and with none of the other constructs; this weak correlation was not adjusted for multiple comparisons and should be interpreted cautiously. Mean item scores were highest for perceived benefits (3.89) and interpersonal influences (3.60), intermediate for competing demands (3.36), self-efficacy (3.25), and commitment (3.18), and lowest for perceived barriers (2.87).

Table 1. Pearson correlations among HPM constructs, commitment and adherence, and competing demands (N = 153)

Variable	1	2	3	4	5	6	Item mean
1. Perceived benefits							3.89
2. Perceived barriers	0.11						2.87
3. Perceived self-efficacy	0.41***	0.06					3.25
4. Interpersonal influences	0.52***	0.12	0.57***				3.60
5. Commitment and adherence	0.33***	0.12	0.66***	0.49***			3.18
6. Competing demands	0.08	0.18*	-0.14	-0.10	-0.08		3.36

Note. * $p < 0.05$; *** $p < 0.001$ (two-tailed, not adjusted for multiple comparisons). Item mean = scale mean divided by the number of items (range 1–5).

3.2 Characteristics of the interview participants

The 20 interview participants were aged 45 to 62 years (mean 54.2 years). Most had completed senior high school ($n = 10$) and were housewives ($n = 14$), and household income was most often 2–5 million IDR ($n = 10$; Table 2).

Table 2. Characteristics of the qualitative interview participants (n = 20)

Characteristic	Value
Age (years), mean (range)	54.2 (45–62)
Education level, n (%)	
Elementary school	3 (15)

Characteristic	Value
Junior high school	4 (20)
Senior high school	10 (50)
Bachelor's degree	2 (10)
Postgraduate	1 (5)
Employment status, n (%)	
Housewife	14 (70)
Retired	3 (15)
Full-time employed	2 (10)
Part-time employed	1 (5)
Monthly household income, n (%)	
< 2 million IDR	1 (5)
2–5 million IDR	10 (50)
5–10 million IDR	3 (15)
> 10 million IDR	6 (30)

Note. IDR = Indonesian rupiah.

3.3 Qualitative themes

Thematic analysis produced seven themes that correspond to the HPM constructs (Table 3). Each is summarised below with the matching quantitative result.

Perceived benefits as an adherence catalyst. Women clearly understood the health benefits of regular aerobic exercise during menopause and saw it as a way to stay active and cope with physical change. They also valued group exercise for the enjoyment, mutual encouragement, and social contact it offered. This agrees with the high benefit scores (item mean 3.89).

Perceived barriers impeding consistency. The most common barriers were multigenerational caregiving, household duties, and menopausal symptoms (heat, sweating, palpitations, poor sleep, and stiff joints). Women also found solitary exercise monotonous, were unsure which exercise suits an older woman, and feared injury. Barriers scored moderately (item mean 2.87), but the interviews show that this reflects exhaustion and heavy domestic duties rather than indifference.

Interpersonal influences shaping motivation. Husbands and children usually approved of exercise provided that household tasks were completed, so family support was passive and conditional. Peers, in contrast, actively encouraged one another, for example in Prolanis (chronic disease management programme) gymnastics groups (item mean 3.60).

Situational influences determining opportunity. Weekends and public holidays were the main windows for exercise, when grandchildren were cared for by their parents and household duties eased. Hot weather and traffic congestion discouraged outdoor exercise, and women wanted a suitable venue and an instructor.

Perceived self-efficacy and fluctuating volition. Many women doubted that they could start and keep exercising on their own, had difficulty managing time, and preferred to exercise with an instructor or companions (item mean 3.25).

Competing demands as socio-cultural realities. Several women gave priority to religious, community, and family activities, including pengajian, qasidah rehearsals, church choir practice, and arisan. Some relied on jamu and dietary changes to maintain health instead of exercise (item mean 3.36).

Inconsistent commitment and accidental adherence. Commitment depended on opportunity rather than routine. Women exercised when an organised programme or a companion was available and often did not otherwise (item mean 3.18).

Table 3. Themes, subthemes, and representative quotations on aerobic exercise adherence

Subtheme	n	Representative quotation (English translation)
Theme 1. Perceived benefits as an adherence catalyst		
Cognitive awareness of health preservation in later life	10	"Exercise is inherently very good, especially for women who have undergone menopause."
Group aerobic exercise as a recreational and motivational catalyst	12	"...it would be even better if the exercise is done together so it won't be boring and we can encourage each other."
Theme 2. Perceived barriers impeding consistency		
Double burden of caregiving	14	"Because I am already busy babysitting my grandchildren and taking care of my elderly parents, I cannot exercise routinely."
Severity of menopausal symptoms and ageing	4	"...because being old hinders me from doing exercise movements. I easily get out of breath and my body feels sore."
Monotony and ambiguity in exercising alone	9	"I am confused about what kind of exercise to start. Because I have never exercised in the past. Being this old, is it not too late?"
Theme 3. Interpersonal influences shaping motivation		
Passive or conditional family support	8	"My husband and children support me if I exercise, but the housework remains my responsibility."
Robust peer group encouragement	5	"Gathering with peers of the same age allows us to share stories and experiences about dealing with menopause."
Theme 4. Situational influences determining opportunity		
Weekend and holiday availability windows	16	"I only have time to exercise on days off or Sundays."
Theme 5. Perceived self-efficacy and fluctuating volition		
Deficient internal commitment and time management	10	"I am indeed not very routine or disciplined in doing exercise."
Efficacy dependency on external direction	8	"Actually, I just need a friend who can motivate and encourage me in exercising."
Theme 6. Competing demands as socio-cultural realities		
Prioritisation of communal socio-religious activities	3	"...in the afternoon, I usually have an Islamic recitation and a social gathering (arisan) in this neighborhood."
Cultural health substitution strategies	4	"...when it comes to exercise, I cannot do it regularly, but I manage my diet and get enough sleep."
Theme 7. Inconsistent commitment and accidental adherence		
Accidental and conditional adherence patterns	10	"If I exercise alone, I am lazy and often skip it. But if a friend picks me up or goes together with me to the venue, only then am I motivated and sure to come."

Note. n = number of participants contributing to the subtheme.

4. DISCUSSION

4.1 Self-efficacy as the strongest correlate of commitment

Perceived self-efficacy had the strongest correlation with commitment to aerobic exercise adherence ($r = 0.66$), the largest of all HPM constructs examined. This agrees with the HPM, which identifies self-efficacy as a key determinant of health-promoting behaviour (7), and with Bandura's social cognitive theory: women who are confident that they can cope with fatigue, discomfort, and environmental obstacles are more likely to keep exercising despite the challenges of menopause. Self-efficacy-based self-care education has recently been evaluated among Indonesian women with early menopause (15), which shows growing attention to this construct in the population. The interviews explain the pattern: many women doubted their ability to exercise alone, preferred instructor-led or peer-supported sessions, and struggled to manage their time. Confidence, more than knowledge, therefore appears to separate intention from action. Because the data are cross-sectional correlations, they cannot show that self-efficacy causes commitment; the reverse direction, or shared method variance in self-reports, is also possible. Even so, strengthening self-efficacy through supervised exercise, graded goal setting, positive feedback, and peer support should be a central component of nurse-led programmes and may be more effective than health education alone.

4.2 Perceived benefits

Perceived benefits correlated positively with commitment ($r = 0.33$), the weakest of the three positive correlates, although benefit scores were the highest of all constructs. This is consistent with the HPM, in which perceived

benefits motivate the initiation and maintenance of health behaviours (7), and with evidence that more physical activity is strongly associated with milder menopausal symptoms (3,16), the very outcome women expected from exercise. Almost all interviewees knew the benefits, yet few exercised regularly, so awareness is necessary but not sufficient. Group exercise emerged as a way to add enjoyment and social contact to health benefits, which is the logic of a community-based programme piloted to increase exercise adherence among menopausal and postmenopausal women (17).

4.3 Interpersonal influences

Interpersonal and situational influences correlated positively with commitment ($r = 0.49$) and strongly with self-efficacy ($r = 0.57$) and perceived benefits ($r = 0.52$). In the HPM, interpersonal influences include emotional encouragement, informational guidance, modelling, and shared norms (7). Physical activity and social support have both been associated with better quality of life among middle-aged women [18], and social support interventions have been reviewed in relation to menopausal symptoms [19]. The positive intercorrelations suggest that women who receive more interpersonal support recognise the benefits of exercise more readily and feel more confident, and the importance of enabling conditions around the menopausal transition has been stressed (20). The interviews add detail: family support was passive and conditional, as couples' attitudes toward menopausal changes may be (21), whereas peers actively encouraged one another. In a collectivist setting, peer groups may therefore be a stronger lever for exercise than family encouragement.

4.4 Perceived barriers and competing demands

Perceived barriers were not significantly related to commitment ($r = 0.12$), contrary to the HPM assumption. Women's accounts show that this does not mean barriers are unimportant: multigenerational caregiving, household duties, and menopausal symptoms such as hot flushes, sweating, and disturbed sleep (22,23) were widespread, and exercise was often given the lowest priority. Caregiving in the "sandwich generation" (24) and barriers to home-based activity among sedentary women (25) point to similar structural constraints. Self-efficacy and interpersonal support may have buffered the effect of barriers on commitment, but this design cannot test it, and motivational strategies have been proposed to sustain adherence (26). Competing demands showed no meaningful correlation with commitment ($r = -0.08$) and only a weak one with perceived barriers ($r = 0.18$). The interviews show that these demands are nonetheless real, including pengajian, qasidah rehearsals, church choir practice, and arisan, with jamu and diet used as substitutes. Such demands arise mainly from social and environmental circumstances rather than individual cognitions (27), and cultural norms and social obligations may also influence adherence in other settings (28,29).

4.5 Situational influences and commitment

Women used weekends and holidays, when grandchildren were cared for by their parents, whereas hot weather and traffic discouraged outdoor exercise. This agrees with the HPM view that situational influences can facilitate or hinder behaviour by shaping its context (7,11). Commitment was moderate (item mean 3.18) and, in the interviews, depended on opportunity: women exercised when a programme or companion was available. This is consistent with work on exercise maintenance and motivation, which suggests that behaviours that rely on external cues are less likely to become sustained habits (30,31).

4.6 Implications for nursing practice and limitations

A nurse-led programme such as MENO-CERIA could (a) build self-efficacy through instructor-guided sessions, graded goals, and feedback; (b) schedule group sessions on Sundays and holidays near women's homes; (c) draw on existing groups such as Prolanis, religious congregations, and arisan; (d) involve husbands and children in sharing household tasks; and (e) give clear guidance on suitable exercise and injury prevention. Limitations include the cross-sectional design, self-reported measures, a single city, and a small interview sample. Commitment rather than actual exercise behaviour was measured, activity-related affect was not measured, the content validity index has not been assessed, and the competing demands scale had borderline reliability. The weak correlation between perceived barriers and competing demands was not adjusted for multiple comparisons. The findings may not transfer to other regions or cultures.

5. CONCLUSION

Among Indonesian menopausal women, self-efficacy had the strongest correlation with commitment to aerobic exercise, followed by interpersonal influences and perceived benefits, whereas perceived barriers and competing

demands were not significantly related to commitment. Women knew the benefits of exercise but exercised mainly when time, companions, and instructors allowed. Nurse-led programmes should therefore build self-efficacy, offer instructor-led group exercise with peer support at times that fit women's daily lives, and engage families in sharing household tasks. Longitudinal and intervention studies are needed to test these directions and to measure actual exercise behaviour.

ACKNOWLEDGEMENT

The authors thank all the women who took part in the survey and interviews. This study received no external funding. The authors declare no conflict of interest. The generative AI tool Claude (Anthropic) was used to assist with drafting, language editing, and formatting of the manuscript and references; the authors verified the content, analyses, and references and take full responsibility for the article.

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