Socio-cultural sustainability of non-hormonal IUD use and women's active living in Pekanbaru, Indonesia

Sostenibilidad sociocultural del uso del DIU no hormonal y la vida activa de las mujeres en Pekanbaru, Indonesia

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Abstract

Introduction: Family planning is widely recognized as a key component of women's health and social well-being, particularly in urban contexts where socio-cultural conditions shape access to and continuity of contraceptive use. Non-hormonal intrauterine devices (IUDs) are long-acting and reversible contraceptive methods; however, their utilization remains relatively low in Pekanbaru City, Indonesia, where socio-cultural factors continue to influence contraceptive choices.

Objective: This study aims to assess the socio-cultural sustainability of non-hormonal IUD use among family planning acceptors in Pekanbaru City.

Methodology: A quantitative cross-sectional study with an exploratory analytical approach was conducted in 2025, which involved 99 women registered as family planning acceptors in Tuah Madani and Sail districts. Data were collected using structured questionnaires and analyzed using Multidimensional Scaling (MDS) to generate a socio-cultural sustainability index. Root Mean Square (RMS) analysis was applied to examine attribute sensitivity, and the model strength was assessed by using a Monte Carlo simulation.

Results: The socio-cultural sustainability index reached 58.1, which indicated a moderately sustainable condition. Religious norms and knowledge-related attributes demonstrated higher sensitivity within the sustainability configuration, while socio-demographic, relational, and service-related attributes showed moderate sensitivity. Attributes related to attitudes toward environmental impact and exposure to rumors exhibited lower sensitivity. The model demonstrated good stability (stress = 0.14; R^2 = 0.95).

Conclusion: The sustainability of non-hormonal IUD use in Pekanbaru City is formed by the interaction of multiple socio-cultural attributes. Strengthening culturally sensitive communication, improving access to accurate contraceptive information, and enhancing spousal and community engagement may support more sustainable family planning practices.

Keywords

Family planning; non-hormonal IUD; socio-cultural sustainability; active living; urban health.

Resumen

Introducción: La planificación familiar es un componente clave de la salud y el bienestar de las mujeres, especialmente en contextos urbanos donde los factores socioculturales influyen en el uso de anticonceptivos. Los dispositivos intrauterinos (DIU) no hormonales son métodos reversibles y de larga duración; sin embargo, su utilización sigue siendo limitada en la ciudad de Pekanbaru, Indonesia.

Objetivo: Evaluar la sostenibilidad sociocultural del uso del DIU no hormonal entre las aceptantes de planificación familiar en Pekanbaru.

Metodología: Se realizó un estudio cuantitativo transversal con un enfoque analítico exploratorio en 2025, que incluyó a 99 mujeres. Los datos se recogieron mediante cuestionarios estructurados y se analizaron con Escalamiento Multidimensional (MDS) para estimar un índice de sostenibilidad. La sensibilidad de los atributos se examinó mediante el análisis de la Raíz Media Cuadrática (RMS), y la estabilidad del modelo se evaluó con simulación de Monte Carlo.

Resultados: El índice de sostenibilidad sociocultural fue de 58,1, lo que indica una condición moderadamente sostenible. Las normas religiosas y los atributos relacionados con el conocimiento mostraron mayor sensibilidad, mientras que otros atributos presentaron una sensibilidad moderada. El modelo mostró buena estabilidad (estrés = 0,14; R^2 = 0,95).

Conclusión: La sostenibilidad del uso del DIU no hormonal en Pekanbaru depende de la interacción de múltiples atributos socioculturales. El fortalecimiento de la comunicación culturalmente sensible y del acceso a información confiable puede favorecer prácticas de planificación familiar más sostenibles.

Palabras clave

Planificación familiar; DIU no hormonal; sostenibilidad sociocultural; vida activa; salud urbana.

Introduction

Family planning is widely recognized as an important component of women's health and well-being and has been discussed in global health literature as contributing to broader social sustainability. Access to contraception is associated with improved maternal health outcomes and supports women's ability to manage reproductive intentions, which may help reduce health-related disruptions in daily life (United Nations Population Fund [UNFPA], 2025). In urban contexts, family planning is often viewed not only as a health intervention but also as part of efforts to support women's quality of life.

Among available contraceptive methods, non-hormonal intrauterine devices (IUDs) are commonly described as long-acting and reversible methods that do not involve systemic hormonal exposure. National family planning guidelines in Indonesia classify IUDs as long-acting reversible contraceptives and emphasize their effectiveness and suitability for long-term use when supported by appropriate counseling and follow-up (Kementerian Kesehatan Republik Indonesia, 2021). These characteristics have also been discussed in the clinical and public health literature as potential advantages of non-hormonal IUDs (McKay & Gilbert, 2014; Bongaarts & Sitruk-Ware, 2019). Nevertheless, decisions regarding IUD adoption and continuation are shaped by a range of non-medical factors.

Previous studies have highlighted the role of socio-cultural factors in contraceptive behavior, including social norms, religious values, spousal dynamics, community perceptions, access to information, and trust in health services (Adedini et al. 2018; Sundararajan et al. 2019; Tigabu et al. 2018). These factors interact with service delivery and institutional contexts, shaping women's perceptions and acceptance of contraceptive methods.

Research on IUD utilization has largely focused on clinical effectiveness, contraceptive prevalence, or individual-level determinants of uptake and continuation (Anguzu et al. 2018; Casey et al., 2017). While such studies provide important insights, they offer a more limited understanding of how broader socio-cultural environments contribute to the sustainability of contraceptive use in everyday life. In this context, the concept of socio-cultural sustainability is understood as the extent to which social acceptance, cultural norms, information environments, and institutional support collectively enable continued use, remains relatively underexplored in empirical studies of non-hormonal IUDs, particularly in urban settings of low- and middle-income countries.

Urban areas are characterized by social heterogeneity and uneven access to health services, conditions that may influence both opportunities for information dissemination and barriers to contraceptive use (United Nations Department of Economic and Social Affairs [UNDESA], 2022). In the Indonesian context, empirical studies suggest that socio-cultural considerations, such as religious norms, gender relations, community influence, and the role of health institutions, continue to form contraceptive decision-making, including IUD use (Setiasih et al., 2016; Etnis et al., 2018).

Pekanbaru City, a rapidly developing urban area in Indonesia, provides a relevant setting for examining these dynamics. The city shows socio-cultural diversity and varying access to family planning services across districts, reflecting broader national urban patterns. Examining the socio-cultural sustainability of non-hormonal IUD use in this context may offer insights into conditions that support urban family planning programs. Administrative statistics indicate that non-hormonal IUD use represents a relatively small proportion of contraceptive methods among family planning acceptors in Pekanbaru City (Badan Pusat Statistik Kota Pekanbaru, 2025).

Physical activity and active living have been identified as important components of population health and well-being at the global level (World Health Organization [WHO], 2022). Recent evidence further suggests that access to and participation in active living are socially patterned, with some factors such as age, education, gender, and socio-economic conditions, which shape unequal opportunities for physical activity and contribute to broader health inequalities (Albisua Kaperotxipi et al., 2025). In this study, active living is approached as a conceptual notion referring to women's capacity to remain engaged in daily activities, social roles, and community life, rather than as a directly measured behavioral outcome. From this perspective, reproductive health choices, including sustained access to acceptable contraceptive methods, may indirectly influence women's continuity of daily functioning by reducing health-related and psychosocial disruptions.

Accordingly, this study aims to assess the socio-cultural sustainability of non-hormonal IUD use in Pekanbaru City using a quantitative cross-sectional design with an exploratory analytical approach. Rather than establishing causal relationships, the study focuses on identifying socio-cultural attributes with higher sensitivity to changes in the sustainability index.

Method

Study Design and Setting

This study employed a quantitative cross-sectional design with an exploratory analytical approach. The design was selected to examine the socio-cultural sustainability of non-hormonal intrauterine devices (IUDs) within family planning practices at a single point in time, without aiming to establish causal relationships.

The study was conducted in Pekanbaru City, Indonesia, an urban area, which was characterized by socio-cultural diversity and variation in access to family planning services. Data were collected in 2025 across selected districts to capture variations in socio-cultural contexts which relevant to family planning programs and contraceptive decision-making.

Population and Sample

The study population for the quantitative survey consisted of women of reproductive age which registered as family planning acceptors in Pekanbaru City, Indonesia. The survey was conducted in two districts, Tuah Madani and Sail, which were selected to represent urban areas with different population sizes and socio-cultural characteristics. Based on administrative records, the total number of family planning acceptors in these two districts was 18,339 women.

Sample size was determined by using the Slovin formula with a margin of error of 10%, resulting in a total sample of 99 respondents. A proportional random sampling technique was applied at the district level to allocate the sample according to the size of the family planning acceptor population in each district. Accordingly, 90 respondents were selected from the Tuah Madani District and 9 respondents from the Sail District.

At the field level, respondents were recruited using an accidental sampling approach, whereby eligible family planning acceptors encountered during data collection were invited to participate until the predetermined sample size for each district was reached. All participating women gave informed consent before the study.

In addition to the survey, qualitative data were collected through in-depth interviews with key informants selected purposively based on their roles and expertise in family planning programs. These included two key informants from the Population Control and Family Planning Office of Pekanbaru City, namely the Head of Population Control and the Head of the Family Planning Division, as well as two primary informants who were health workers responsible for family planning services at community health centers in The Tuah Madani and The Sail districts (Sugiyono, 2016).

Data Collection

Quantitative data were collected by using a structured questionnaire administered to women registered as family planning acceptors in Pekanbaru City, Indonesia. Data collection was conducted in 2025 through interviewer-assisted, face-to-face surveys in selected districts, following the predetermined proportional sample allocation. This approach was used to ensure clarity of questions and consistency in data recording.

The questionnaire was designed to capture socio-demographic and socio-cultural attributes relevant to the sustainability of non-hormonal intrauterine device (IUD) use within family planning practices. The attributes included the wife's age (categorized into reproductive age groups), parity (number of children), educational level of the wife and husband, husband's support for IUD use, support from health workers, perceived religious norms regarding IUD use, exposure to community rumors related to IUDs, knowledge of non-hormonal IUDs, knowledge of the environmental impacts of IUD use, attitudes toward

the environmental impact of IUDs, and respondents' history of IUD use (never used, previously used, or currently using).

All attributes were defined operationally prior to data collection and measured using ordinal scales, with category classifications which were adapted from established literature and previous empirical studies. The questionnaire was intended to support exploratory, attribute-based analysis rather than hypothesis testing, latent construct measurement, or causal inference. Accordingly, no psychometric validation or internal consistency testing was done, as the instrument didn't measure latent variables.

In addition to the quantitative survey, qualitative data were collected through in-depth interviews with selected key informants to provide contextual insights into the implementation of family planning programs and socio-cultural dynamics related to non-hormonal IUD use. Key informants were selected purposively based on their institutional roles and experience in family planning services. Information obtained from these interviews was used only to support the interpretation of the quantitative findings and was not subjected to statistical analysis (Creswell, 2018).

In this research, although the term "active life" is included in the title of the study, it is not treated as an operationalized or directly measured variable. Instead, active life is conceptualized as a broader contextual notion referring to women's capacity to remain engaged in daily activities and social roles. The empirical focus of the study is placed on socio-cultural attributes related to family planning practices and non-hormonal IUD use, which are discussed in relation to active living at a conceptual level rather than through direct measurement.

Analytical Framework and Data Analysis

The analytical framework of this study was structured to link socio-cultural attributes of family planning acceptors with the assessment of socio-cultural sustainability of non-hormonal intrauterine device (IUD) use within family planning practices. The framework conceptualizes sustainability as an emergent condition derived from the combined performance of multiple socio-cultural attributes, rather than as the result of single causal factors.

The survey collected socio-demographic, socio-cultural, knowledge, attitudinal, and contraceptive history data as analytical inputs. These attributes were analyzed simultaneously to examine their relative positioning and contribution within the overall sustainability configuration. The framework does not assume causal pathways but focuses on identifying patterns and sensitivities among attributes in an exploratory manner.

Multidimensional Scaling (MDS) was employed as the core analytical technique to transform the multidimensional attribute data, which was measured on ordinal scales into a lower-dimensional spatial configuration. This configuration represents the relative sustainability status of non-hormonal IUD use based on the combined attribute scores. From this spatial configuration, a sustainability index was calculated and expressed on a scale of 0 to 100, with higher values indicating more favorable socio-cultural sustainability conditions. The index was subsequently classified into sustainability status categories for interpretative purposes.

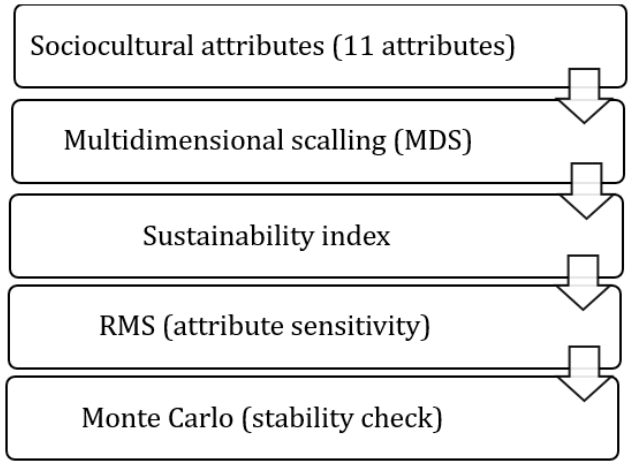
To further examine the role of individual attributes, Root Mean Square (RMS) values were calculated. RMS values indicated attribute sensitivity, showing which attributes most influence sustainability configuration changes. They are interpreted comparatively to highlight key shaping attributes, not causal effects

Monte Carlo analysis was incorporated into the framework as a strength assessment to evaluate the stability of the MDS configuration and sustainability index. By repeatedly simulating random perturbations of the input data, the Monte Carlo procedure assessed the consistency of the results under uncertainty. Small differences between the original MDS outcomes and Monte Carlo simulations were interpreted as indicating acceptable stability of the analytical results.

All analyses were conducted by using exploratory, non-parametric procedures appropriate for ordinal data. The analytical framework guided the interpretation of results by emphasizing patterns, relative positions, and sensitivities of socio-cultural attributes, in alignment with the exploratory design and scope of the study (Kavanagh & Pitcher, 2004).

The analytical framework is summarized in Figure 1:

Figure 1. Analytical framework



Ethical Considerations

This study was conducted in accordance with ethical principles for research involving human participants. Ethical approval was obtained from the Health Research Ethics Committee of Institut Kesehatan Payung Negeri Pekanbaru (Approval No. 181/IKES PN/KEPK/IV/2025), which served as the ethical basis for conducting the study with human respondents. Prior to data collection, permission to conduct the study was obtained from the relevant local authorities. All participants were informed about the purpose of the study, the voluntary nature of their participation, and their right to withdraw at any time without any consequences. Written or verbal informed consent was obtained from all respondents before their inclusion in the study. To ensure confidentiality and anonymity, no personally identifiable information was collected or recorded. All data were used only for research purposes and were analyzed in aggregate form. For the qualitative component, key informants participated voluntarily and provided informed consent prior to the interviews. Ethical standards were consistently observed throughout the research process.

Results

Existing Conditions of IUD Use

Table 1 indicates that the majority of family planning acceptors reported never having used a non-hormonal IUD, highlighting the relatively limited penetration of this method within the study population. At the same time, the socio-demographic profile of respondents reflects conditions that are generally considered supportive of long-acting contraceptive use. Most respondents were within the healthy reproductive age category and had moderate parity, suggesting that many women were at a reproductive stage where pregnancy planning and spacing are relevant considerations.

Educational attainment was predominantly at the secondary level for both wives and husbands, indicating a basic level of formal education that may facilitate access to health information. However, the husband support for IUD use was evenly distributed between supportive and non-supportive responses, reflecting variability in spousal dynamics that may determine contraceptive decision-making within households.

From a service-related perspective, almost half of the respondents reported that they received supportive information from healthcare workers. It suggested that counseling access is available but unevenly accessed. Religious norms were largely perceived as non-restrictive toward IUD use, indicating that formal religious prohibition is not a dominant barrier in this context. Nevertheless, exposure to community rumors remained common, with a majority of respondents reporting having heard at least one rumor related to IUD use. This coexistence of permissive norms and persistent misinformation points to a complex information environment surrounding IUDs.

In terms of knowledge and attitudes, most respondents demonstrated good knowledge of IUD contraception and a good understanding of the environmental implications of IUD use. Positive attitudes toward the environmental impact of IUDs were also prevalent. Overall, the findings indicate that positive individual knowledge and attitudes coexist with social and informational obstacles, providing crucial context for understanding variations in socio-cultural sustainability analysis.

Table 1. Existing conditions of IUD use

Attributes	Categories	Frequency	Percentage (%)
IUD Use	Never used	74	74.8
	Ever used	12	12.1
	Currently using	13	13.1
Wife's age	Early reproductive age	3	3.0
	Late reproductive age	47	47.5
	Health reproductive age	49	49.5
Parity	Low parity	43	43.4
	Moderate parity	52	52.5
	High parity	4	4.0
Wife's education	Primary	13	13.1
	Secondary	52	52.5
	Higher	34	34.4
Husband's education	Primary	14	14.1
	Secondary	60	60.6
	Higher	25	25.3
Husband's support	Not supportive	35	35.4
	Less supportive	29	29.2
	Supportive	35	35.4
Healthcare worker support	Not supportive	9	9.1
	Less supportive	42	42.4
	Supportive	48	48.5
Religious norms	Prohibited	5	5.0
	Conditional	25	25.3
	Not prohibited	69	69.7
Rumors in community	All rumors	14	14.2
	≥1 rumor	51	51.5
	No rumors	34	34.3
Knowledge about IUD	Poor	3	3.0
	Fair	28	28.3
	Good	68	68.7
Knowledge about impact of IUDs on the environment	Poor	11	11.1
	Fair	15	15.2
	Good	73	73.7
Attitude about impact of IUDs on the environment	Very weak	0	0.0
	Weak	0	0.0
	Moderate	9	9.1
	Strong	57	57.6
	Very strong	33	33.3

Socio-cultural Sustainability Index

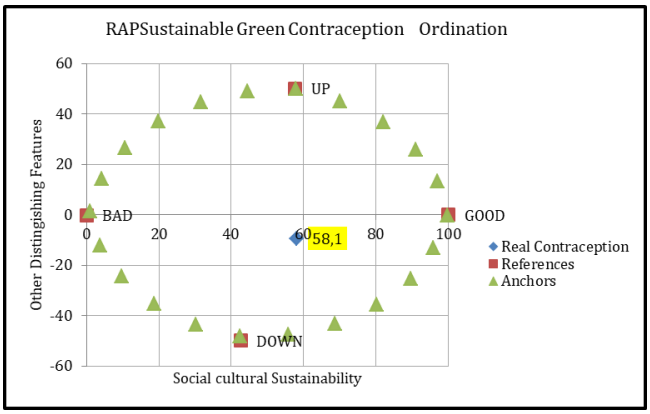
The RAPSGreenC sustainability assessment resulted in an MDS index score of 58.1, indicating moderate sustainability for the socio-cultural aspect of non-hormonal IUD use (Figure 2). Overall, this score indicates that the socio-cultural environment surrounding IUD use in Pekanbaru City provides a relatively supportive foundation, although it has not yet reached conditions associated with high sustainability.

The placement of the index in this range suggests the coexistence of enabling and constraining socio-cultural attributes within the study context. While certain attributes appear to support the continuity of IUD use, others remain insufficiently strengthened, resulting in a sustainability profile that is neither fragile nor fully consolidated.

Importantly, the sustainability index represents the combined configuration of multiple socio-cultural attributes rather than the contribution of any single attribute. Accordingly, the index is interpreted as a descriptive snapshot of the sustainability status at the time of data collection, reflecting how various

social, normative, relational, and informational conditions interact within the urban family planning context

Figure 2. Analysis of the sustainability of IUD use from a socio-cultural dimension



Attribute Sensitivity Analysis

The sensitivity structure of the socio-cultural dimension was examined using Root Mean Square (RMS) values which was derived from the Multidimensional Scaling (MDS) configuration. The results reveal variation in the responsiveness of individual attributes within the overall sustainability profile (Figure 3).

Religious norms showed the highest RMS value (3.3), indicating that this attribute occupies the most responsive position within the socio-cultural configuration. Changes related to religious norms are accompanied by relatively larger shifts in the sustainability index which was compared to other attributes.

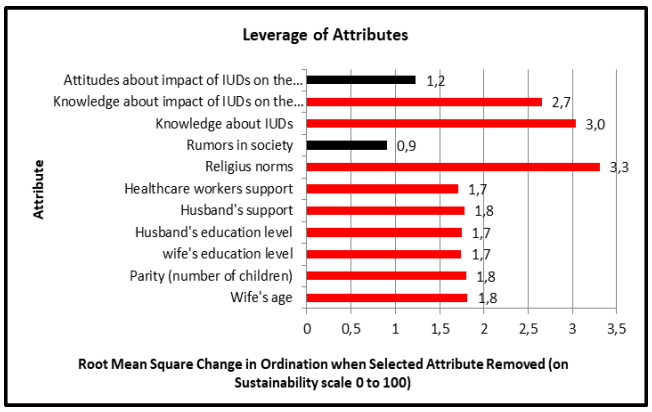
Knowledge-related attributes also relatively demonstrated high sensitivity. Knowledge of IUD contraception showed an RMS value of 3.0, while knowledge of the environmental impact of IUD use recorded an RMS value of 2.7. These findings suggest that informational dimension is an important and responsive component of the sustainability structure.

Several socio-demographic and relational attributes displayed moderate sensitivity. The husband's support, parity (number of children), and wife's age, each recorded an RMS value of 1.8 which indicated that variations in these attributes are associated with noticeable, though less pronounced, changes in the sustainability configuration. Similarly, healthcare workers' support, wife's education level, and husband's education level showed comparable RMS values (1.7), reflecting a moderate degree of responsiveness within the configuration.

In contrast, attitudes toward the environmental impact of IUDs and exposure to community rumors showed lower RMS values, which indicated a relatively limited level of responsiveness within the sustainability configuration. Although these attributes are part of the socio-cultural context, changes in these areas have a relatively smaller impact on the overall sustainability profile compared to more sensitive attributes.

Overall, the RMS results illustrate that sensitivity within the socio-cultural sustainability configuration is unevenly distributed across attributes. Normative and knowledge-related attributes occupy more responsive positions. While demographic, support-related, and attitudinal attributes contribute more moderately to variations in the sustainability profile. These results provide an empirical basis for distinguishing attributes with higher and lower sensitivity within the current socio-cultural context of non-hormonal IUD use.

Figure 3. Analysis of sensitive attributes



Model Validation

Model strength was assessed by using a Monte Carlo analysis with a 95% confidence interval. As shown in Table 2, the sustainability index from the original MDS analysis (58.1) was nearly identical to the Monte Carlo simulation result (57.7), with a small difference of 0.4.

The ordination produced a stress value of 0.14, which falls below the commonly accepted threshold of 0.20, which indicates an acceptable level of configuration fit. In addition, the coefficient of determination (R^2 = 0.95) suggests that a substantial proportion of variance within the socio-cultural dimension is captured by the MDS configuration.

Overall, these results indicate that the MDS configuration shows a high degree of consistency and stability under simulation, thus it provides a reliable basis for describing the socio-cultural sustainability profile which is observed at the time of data collection.

Table 2. Monte Carlo analysis

Parameter	MDS	Monte Carlo	Difference	Stress	R2
Value	58.1	57.7	0.4	0.14	0.95

Discussion

The findings of this study indicate that socio-cultural conditions in Pekanbaru City are closely associated with the sustainability of non-hormonal IUD use among family planning acceptors. The Multi-Dimensional Scaling (MDS) score places the socio-cultural dimension within the "moderately sustainable" category, which suggests that existing conditions are relatively supportive but still leave considerable room for strengthening. This level reflects a balance between enabling factors and persistent constraints that may influence the continuity of IUD use over time.

Among the assessed attributes, religious norms show the highest RMS value, indicating that this attribute is particularly sensitive to changes within the socio-cultural sustainability configuration. Religious norms represent a powerful form of social influence that shapes individual decision-making in everyday life, including reproductive health behavior. Notoatmodjo (2016) emphasizes that prevailing social norms play a central role in shaping health-related attitudes and practices. Although the majority of respondents reported that religious teachings do not prohibit IUD use, the elevated RMS value suggests that this attribute remains responsive to shifts in interpretation, communication, and social discourse. In the Indonesian context, cultural sensitivity surrounding women's intimate body areas continues to influence perceptions of IUD insertion procedures, even when religious guidance permits their use under appropriate medical conditions (Wijaya et al., 2019). Previous studies have documented that religious interpretations can shape contraceptive behavior in different ways, including

situations where women adopt contraception discreetly due to social pressure (Sundararajan et al., 2019 ; Tigabu et al., 2018). Evidence from Nigeria further demonstrates that engagement of religious leaders can substantially strengthen acceptance and continuation of modern contraceptive methods (Adedini et al., 2018). From an active living perspective, religious norms function not only as moral guidelines but also as social reference points that shape women's comfort, confidence, and continuity in managing reproductive choices within daily life. When religious interpretations are perceived as supportive, women may experience fewer psychosocial disruptions that could otherwise constrain participation in everyday activities and social roles, consistent with global perspectives on active living and well-being (World Health Organization, 2022).

Knowledge related to IUD contraception also demonstrates a relatively high level. Adequate knowledge plays a crucial role in shaping contraceptive behavior, particularly for long-acting methods that are often accompanied by misconceptions. Limited access to accurate information has been widely identified as a barrier to effective pregnancy management in low- and middle-income settings (Sserwanja et al., 2022). Research indicates that myths and misinformation can make people less likely to use and continue contraception (Ajaero et al., 2016; Wildemeersch et al., 2015). Evidence from Indonesia shows that better knowledge gives women more confidence in choosing and continuing contraceptive methods (Najib, 2020; Mindarsih et al., 2018). Health education interventions that deliver clear and accessible information have been shown to enhance contraceptive understanding and informed decision-making (Asnel et al., 2025). Within an active living framework, access to accurate and comprehensible contraceptive information may be understood as a prerequisite for women to manage reproductive decisions without repeated health-related uncertainty. Informational security supports continuity in daily functioning and social participation, rather than positioning contraceptive use as an isolated clinical choice.

Knowledge of IUD environmental impact is a sensitive attribute. Environmental knowledge underlies eco-friendly behavior (Fakhrunissa et al., 2020) and shapes preferences and choice (Mahendra & Bawono, 2022). Although environmental considerations are not traditionally emphasized in family planning, findings show respondents have basic understanding. This suggests environmental framing can complement health messages, reinforcing broader considerations in contraceptive decisions. From a sustainability perspective, awareness of environmental implications strengthens women's responsibility toward long-term well-being beyond individual health.

A Husband's support represents another attribute contributing to the sustainability configuration. Most respondents reported receiving positive support from their spouses, underscoring the importance of shared decision-making within households. Previous studies highlight that husbands' involvement can take multiple forms, including emotional encouragement, financial support, and participation in counseling processes (Monalisa & Ulfah, 2021). Limited support may generate hesitation or fear, particularly regarding long-acting methods such as IUDs (Syam & Rukmana, 2022). Evidence from Indonesia indicates that spousal engagement strengthens continuity of contraceptive use by fostering mutual understanding and agreement (Yeni et al., 2017; Etnis et al., 2018). In the context of active living, spousal support may be interpreted as a stabilizing social condition that reduces emotional stress and decision-related tension in reproductive health management, thereby supporting women's engagement in daily responsibilities and social roles.

Parity also shows moderate sensitivity, which reflects its role in shaping reproductive preferences. Women with moderate to high parity were more likely to consider IUD use, consistent with previous findings that higher parity is associated with a stronger desire to limit or space pregnancies (Etnis et al., 2018). Studies conducted in different settings report that women with larger family sizes are more inclined to adopt long-acting contraceptive methods (Anguzu et al., 2018 ; Marollita et al., 2025). However, other studies show that the number of children doesn't always determine contraceptive behavior. Its impact can be influenced by partner support, access to services, and availability of information (Budiarti et al., 2017). From a life-course and active living perspective, parity reflects accumulated reproductive experience that may influence how women negotiate caregiving responsibilities, health management, and everyday functioning.

Wife's age demonstrates a similar level of sensitivity, with IUD use more commonly observed among women in the healthy reproductive age range. This pattern aligns with evidence which shows higher contraceptive use among women in their most active reproductive years (UNDESA, 2022). Women in

this age group often have greater exposure to health information and reproductive planning services, which may determine their contraceptive preferences (Marollita et al., 2025). Evidence from population-level studies further suggests that women's participation in physical activity tends to decline with increasing age due to structural and social constraints rather than individual choice (Albisua Kaperotxipi et al., 2025). Within this context, sustained access to socially acceptable reproductive health services may be situated as part of broader conditions that support continuity of daily functioning and social participation across reproductive stages which is consistent with global frameworks on active living (World Health Organization, 2022).

Support from healthcare workers also contributes to the socio-cultural sustainability of IUD use. Healthcare workers play a central role in counseling, reassurance, and decision support, particularly for long-acting contraceptive methods (Setiasih et al., 2016). The quality of provider–client interaction has been identified as a key factor influencing acceptance and continuation of IUDs (McKay & Gilbert, 2014). Inadequate counseling or fear-inducing communication may discourage potential users, even when services are available (Casey et al., 2017). Conversely, supportive and empathetic counseling has been shown to enhance confidence and sustained use (Asnel et al., 2025). These findings underscore the importance of strengthening provider capacity and communication skills.

Educational attainment of wives also functions as a leverage attribute. Education is widely recognized as a social determinant of health that enhances autonomy, health literacy, and access to information (Bongaarts & Sitruk-Ware, 2019; Marphatia et al., 2017). Higher education facilitates informed reproductive decision-making; however, empirical evidence suggests that education itself does not guarantee consistent contraceptive use (Mindarsih et al., 2018). This indicates that education interacts with cultural norms, service accessibility, and spousal dynamics in determining contraceptive behavior.

Similarly, husband's education influences knowledge, attitudes, and support within the household. Educated husbands are generally better positioned to understand reproductive health information and to support contraceptive use (Ajaero et al., 2016; Nita et al., 2018). Education may enhance receptiveness to medical guidance and encourage shared decision-making, thereby it supports continuity of contraception use.

Overall, the findings suggest that the sustainability of non-hormonal IUD use in Pekanbaru City is established by a constellation of interrelated socio-cultural attributes rather than by any single determining factor. Attributes with higher RMS values reflect greater sensitivity within the sustainability configuration, indicating areas where changes in social norms, knowledge, or support structures may have meaningful implications. From a broader perspective, sustained access to acceptable and socially supported contraceptive methods may contribute to women's capacity to manage reproductive responsibilities alongside daily activities and social roles, without implying direct effects on physical activity behavior. Improving social and cultural support for family planning is key to supporting women's well-being and quality of life.

Limitations of the Study

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design captures socio-cultural conditions at a single point in time and does not allow for the assessment of changes in sustainability or attribute sensitivity over time. Consequently, the results reflect the configuration observed during the study period rather than dynamic processes of change.

Second, the sample size was relatively modest and limited to two districts within Pekanbaru City. Although proportional sampling was applied and the districts were selected to represent different urban contexts, the findings may not fully represent all socio-cultural variations within the city or other urban settings in Indonesia.

Third, the analytical framework employed an exploratory approach using Multidimensional Scaling and RMS analysis. While this approach is appropriate for identifying patterns and relative sensitivity among attributes, it does not aim to establish causal relationships or quantify the magnitude of effects between variables. The sustainability index and RMS values should therefore be interpreted as indicative of relative positioning and responsiveness within the configuration rather than as predictive measures.

Finally, active living was conceptualized as a contextual notion rather than a directly measured behavioral outcome. So, this study doesn't directly measure physical activity or daily functioning.

Instead, it looks at how social and cultural conditions might support women's ability to keep doing their daily roles and responsibilities.

Despite these limitations, the study provides valuable empirical insights into the socio-cultural sustainability of non-hormonal IUD use within an urban Indonesian context and offers a foundation for future research using longitudinal designs, larger samples, or mixed-method approaches.

Conclusions

The socio-cultural sustainability of non-hormonal IUD use in Pekanbaru City is at a moderately sustainable level. It is established by the interaction of normative, informational, relational, and service-related attributes. Religious norms and knowledge-related attributes appear more sensitive within the sustainability configuration, while other socio-demographic and support-related attributes contribute more moderately. As this study is based on a cross-sectional design with a limited sample and selected urban districts, the results represent a contextual snapshot rather than causal or long-term dynamics. Future studies are recommended to use broader samples and longitudinal or mixed-method designs, while local family planning programs may focus on strengthening culturally sensitive communication, improving the quality of contraceptive information, and enhancing spousal and community engagement to support more sustainable IUD use.

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