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Decision Model for Best Contraceptive Technique Recommendation Based on Patient's Ideal Profile

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Abstract: Choosing the right contraceptive method is essential to support the success of family planning programs. Many patients still choose methods without considering their medical conditions, which can lead to failure or side effects. This study designed a decision-making model based on Profile Matching to recommend contraceptive methods according to the patient's ideal profile. The dataset was obtained from Faskes Level 1 Udayana Denpasar. Validation was conducted through discussions with midwives as experts, referring to the KLOP KB Wheel as the standard issued by the WHO. The evaluation results show a high level of agreement between the model's recommendations and expert judgments, indicating that the model provides more objective and easily understood recommendations compared to manual approaches.

Keywords: Decision Making Model, Contraception, Profile Matching, Patient Ideal Profile.

INTRODUCTION

Problems in reproductive health services, especially contraceptive method selection, are still a big challenge. In Indonesia, the achievement of the use of Long-Term Contraceptive Methods (MKJP) has stagnated below 22%, far from the target of 28.9% by 2024 (BKKBN, National Family Planning Program Performance Report, 2020) . Cases of "conceding" due to less effective natural methods and serious side effects due to the incompatibility of contraceptive methods with the patient's medical condition are still often found (Wyatt et al., 2020) . Field findings at the Udayana First Level Health Facility also reinforce this, where midwives convey that many patients return with unplanned pregnancies because they think natural methods are effective enough and ignore their respective medical conditions. In fact, WHO through the Medical Eligibility Criteria for Contraceptive Use emphasizes the importance of an evidence-based approach that considers individual medical factors(Nguyen et al., 2024) . Unfortunately, manual tools such as the KLOP KB Wheel or the ABPK Ber-KB book are still considered complicated to use in daily practice by health workers.

Based on these problems, innovation is needed in the form of a technology-based decision-making model that can help health workers and patients to provide recommendations for contraceptive methods according to the patient's profile. One potential method is Profile Matching, which is a method used to assess the suitability between an entity and a reference/ideal profile, through calculating the distance or gap between actual attributes and expected criteria, then producing a ranking according to the level of closeness(Khalfallah, Jelassi, Demongeot, & Saoud, 2023) . A number of international studies have shown that this method has various advantages that support its use in decision-making contexts. Profile Matching is able to accommodate both quantitative and qualitative criteria

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simultaneously , thus providing better flexibility than traditional methods(Soares, Abidin, & Wahyuningrum, 2022) . In addition, this approach produces more objective decisions because the calculation process is based on the gap between actual and ideal profiles, so it can minimize subjective bias(Heri Purwanto, Rikky Wisnu Nugraha, Azis Masum, Teguh Wiharko, Fahmi Reza Ferdiansyah, Rudy Sofian, 2024) . Another advantage is that it is transparent and easy to understand, because the final results are presented in the form of clear and informative suitability ratings(Rikala, Braun, Järvinen, Stahre, & Hämäläinen, 2024) . Profile Matching can also be combined with other methods, such as Analytical Hierarchy Process (AHP), to improve the accuracy as well as the consistency of the results, thus strengthening the validity in decision making(Akmaludin, Sihombing, Dewi, Rinawati, & Arisawati, 2022) . Not only that, this method has been proven effective for supporting complex multi-criteria decision making, such as selection, evaluation, and personalized recommendations(Eric R Cohn, 2022)

With these advantages, this study uses the development of a Profile Matching-based decision-making model in contraceptive method selection. The novelty of this model lies in the integration of medical criteria from the WHO KLOP Wheel with an objective, gap-based calculation approach, making it a reliable tool for health workers and patients to minimize method selection errors, increase the effectiveness of family planning programs, and support reproductive health services that align with medical needs and individual preferences.

LITERATURE REVIEW

A number of international studies have highlighted preference factors and patterns of contraceptive use. A study in Ukraine(Mahanova & Tkachenko, 2021) used Conjoint Analysis to explore the preferences of reproductive-age women, finding that effectiveness and convenience were the main factors considered, while side effects and price also influenced decisions. Research in the United States(Gomez et al., 2024) shows a real gap between contraceptive methods used and methods actually desired, where cost barriers, limited access, and discrimination are the main causes of the mismatch. Meanwhile,(Harris et al., 2022) in Australia highlighted a group of women with chronic diseases, who were more likely to choose combined or long-acting methods (LARCs) than healthy women, emphasizing the importance of more personalized counseling as not all diseases are compatible with long-acting or combined contraceptive methods.

On the other hand, a review by (Yeh, Kautsar, Kennedy, & Gaffield, 2022) revealed consistent themes across countries, such as side effects, effectiveness, convenience, cost, as well as autonomy in use, which are all key considerations in contraceptive decision-making. In addition, the systematic review article (Çelik Ertuğrul & Bitirim, 2025) on recommender systems is also relevant, as it discusses the application of various intelligent decision-making methods to provide recommendations that suit users' needs, although the main focus is not on contraception, but on the application of recommender systems in various fields.

In contrast to these five studies, this research presents an innovative approach through the application of Profile Matching Decision Support System (DSS). This approach describes the factors that are the basis for determining the use of contraceptive methods based on the KB KLOP Wheel issued by WHO and based on discussions with direct medical personnel. This model is designed to assist patients in determining the most suitable contraceptive method based on the patient's ideal profile, so that it can support the realization of more effective and patient-centered reproductive health services.

Medical Eligibility Criteria for Contraceptive Use (KLOP Wheel)

The KLOP Contraceptive Wheel is a counseling aid developed based on the Family Planning: A Global Handbook for Providers, jointly published by the World Health Organization and the Johns Hopkins Bloomberg School of Public Health (2022). This handbook integrates the Medical Eligibility Criteria for Contraceptive Use (MEC), which classifies contraceptive methods into four categories: Category 1 (safe to use), Category 2 (can be used with monitoring), Category 3 (risks generally outweigh the benefits), and Category 4 (should not be used) (Handbook & Providers, 2022).

The contraceptive methods included in this tool comprise combined oral contraceptives

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(COC), progestin-only pills (POP), depot medroxyprogesterone acetate (DMPA) injections, implants, copper intrauterine devices (Cu-IUD), levonorgestrel intrauterine devices (LNG-IUD), and sterilization. The use of COCs is contraindicated in conditions such as migraine with aura, a history of venous thromboembolism (VTE), smoking in women over 35 years old, hypertension ≥ 160/100 mmHg, and less than 6 weeks postpartum—especially among breastfeeding mothers. Non-estrogen methods such as POP, DMPA, and IUDs are generally safer options under these conditions. Thus, the KLOP Wheel assists healthcare providers in delivering contraceptive counseling that is safe, rational, and evidence-based (Handbook & Providers, 2022).

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Decision Support System

A Decision Support System (DSS) is an information system used to assist decision-making in an organization or company. It is designed to facilitate complex decision-making processes by providing structured and relevant information. In SPK, data and information are processed using mathematical or statistical methods to produce recommendations or decision options that can help deputizing (Gede Iwan Sudipa et al., 2023). DSS is also defined as a computer-based interactive system that combines data, analytical models, and decision-making techniques to support problem-solving and improve the effectiveness of decisions taken by management (Hugo et al., 2025).

Contraceptive Method

Contraceptives are divided into hormonal and non-hormonal contraceptives. Non-hormonal contraceptives work by regulating the hormonal system of the female body, mainly to prevent ovulation, thicken cervical mucus, and thin the endometrial layer so as to prevent implantation. This method involves synthetic hormones such as estrogen and progestin. Non-hormonal contraceptive methods are divided into three: natural methods, devices, and stable contraception. Hormonal contraception works by affecting the reproductive hormone system, especially in preventing ovulation, thickening cervical mucus, and thinning the endometrial layer so that implantation does not occur (Nada, Mariska, & Debora, 2020) .

Profile Matching Method

Profile Matching is a decision-making method that assumes an ideal level of predictors that must be possessed by the subject, not just a minimum level that is met (Desty Nurmayanti, Tuti Haryanti, Laila Septiana, & Siti Nurdiani, 2022) . This method differentiates the weight of each criterion according to its level of importance, with the advantage of the Core Factor and Secondary Factor which can be determined by the user independently (Harahap, Siregar, & Wulan, 2024) . Profile Matching is also described as a mechanism that compares individual competencies to the ideal performance profile so that the competency differences (GAP) can be identified. The smaller the GAP, the greater the weight value, meaning the subject has a higher suitability to the ideal profile (Maulidah, Sudipa, Fittryani, Widiartha, & Winatha, 2024). The calculation stages include:

1. The first step that must be done is to determine the aspects of the assessment on the *Core Factor* (main factor) and *Secondary Factor* (second factor).
2. Competency GAP mapping is the difference between the criteria that a person has and the desired criteria. The competency GAP formula is :

$$GAP : Criteria\ Values - Minimum\ Values \quad (1)$$

3. Weighting When the GAP mapping has been completed, the results of the mapping are weighted according to the benchmark GAP value weight table, as shown in Table 1 (Gede Iwan Sudipa et al., 2023).

Table 1
GAP Weight

GAP	Value Weight	Information
0	5	competencies as required
1	4, 5	competency advantages 1 level

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-1	4	competency deficiency 1 level
2	3, 5	competency advantages 2 level
-2	3	competency deficiency 2 level
3	2, 5	competency advantages 3 level
-3	2	competency deficiency 3 level
4	1, 5	competency advantages 4 level
-4	1	competency deficiency 4 level

4. Calculation and grouping of *Core Factor* and *Secondary Factor*. After the weight of the GAP value is determined, it is divided into 2 groups, namely *Core Factor* and *Secondary Factor*.
   a. Core factor
      Core factors are aspects (competencies) that stand out/are most needed. To calculate the core factor, the formula used is:

$$NCF = \frac{\sum NC}{\sum IC} \quad (2)$$

      Description:
      NCF : Average value of Core Factor
      NC : Total number of Core Factor values
      IC : Number of Core Factor items
   b. Secondary factors are items other than aspects of the core factor. To calculate the secondary factor, the formula used is:

$$NSF = \frac{\sum NS}{\sum IS} \quad (3)$$

      Description:
      NSF : Average value of Secondary Factor
      NS : Total number of Secondary Factor values
      IS : Number of Secondary Factor items
5. Calculation of Total Value to calculate the total value, the formula used is as follows:

$$N = (X)\%NCF + (Y)\%\ NSF \quad (4)$$

Description:
N : Total value of each aspect
NCF : Average value of Core Factor
NSF : Average value of Secondary Factor
(X)% : Percentage value of Core Factor
(Y)% : Percentage value of Secondary Factor

METHOD

Phases of Research

This study begins by identifying the main problem, which is the error in determining contraceptive methods that can have fatal consequences. Based on statements from medical personnel, there are still many patients who think that natural contraceptives are very safe to use, without considering health conditions and medical history before choosing a contraceptive method. For this reason, the next step is to collect primary and secondary data as the basis for analysis. Under these conditions, a decision-making model is needed that can accommodate various criteria and alternatives objectively. The Multi-Criteria Decision Making (MCDM) method was chosen as the approach, using profile matching because it is considered suitable for solving this problem. The method results in the selection of the best alternative objectively through systematic calculation stages. Tahapan metode penelitian

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Analysis Data

Data for this study were collected at the Udayana Primary Healthcare Facility. The data collection process involved discussions and in-depth interviews with expert practitioners, specifically midwives, to obtain accurate information regarding the criteria based on the KLOP Contraceptive Wheel. The patient or sample data were also gathered directly from this healthcare facility, ensuring that both the expert perspectives and the empirical data were contextually relevant and clinically grounded.

Flowchart of the model's calculation process.

In Figure 1, the calculation flow in the decision-making model for recommending the best contraceptive method is explained.

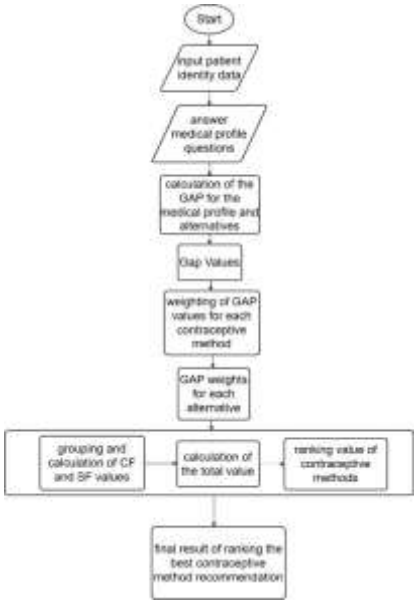

Fig. 1 Flowchart of the model's calculation process

Overview of Decision-Making Model

The decision-making model for selecting the best contraceptive method based on the patient's ideal profile is designed by applying the Profile Matching method. The overview or concept flow scheme used is as follows.

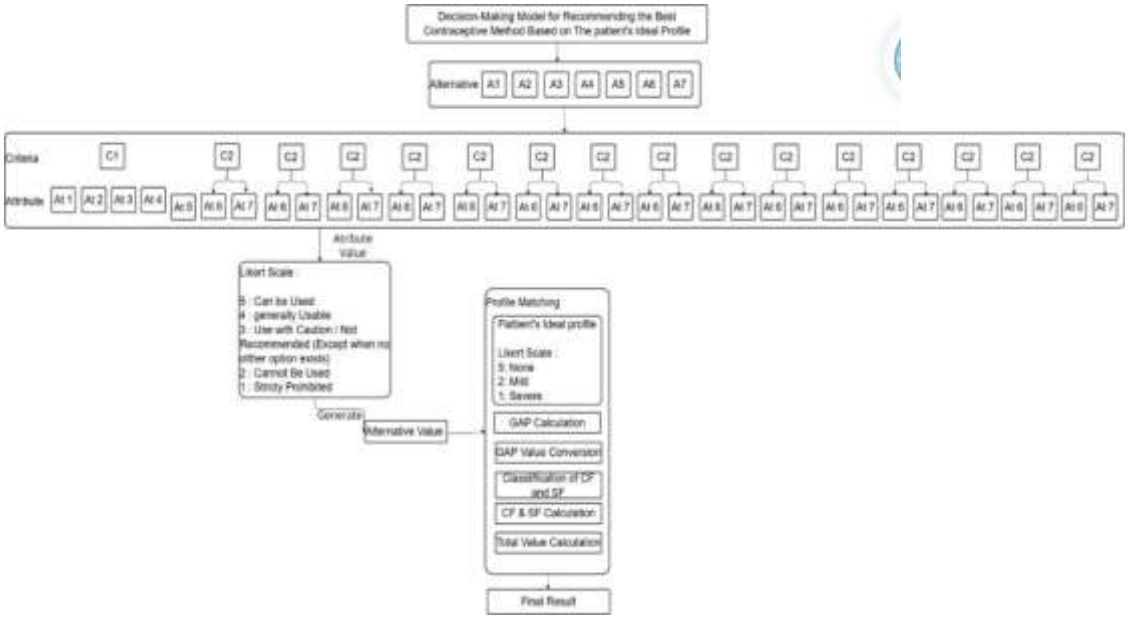

Fig. 2 Decision-Making Model Based on Ideal Profiles

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Figure 1 above is an overview of the decision-making model for recommending the best contraceptive method based on the patient's ideal profile using the Profile Matching method. This model begins with alternatives (A1 - A7) which present that A1 is Combined Hormonal Contraception (Pills, transdermal, ring, injectable, (KPK, KHKT, CVK, KSK), A2 is Progestin Pill Contraception (KPP), A3 is Progestin Injectable Contraception (DMPA (IM, SC) / NET-EN), A4 is Implant (LNG / ETG), A5 is AKDR Levonorgestrel (AKDR-LNG), A6 is AKDR Copper and A7 is Tubectomy (sterile).

Each alternative is assessed based on a number of criteria (K1 - K16) including K1 Hypertension, K2 Hepar Disease, K3 Vaginal bleeding of unknown cause, K4 Breast Cancer, K5 Cervical Cancer, K6 Cardiovascular Disease, K7 Pelvic inflammatory disease, K8 Venous thromboembolism, K9 Headache (Migraine), K10 HIV, K11 Gonorrhea Chlamydia (Sexually transmitted disease), K12 Age, K13 Smoking status, K14 Breastfeeding status, K15 Drug use history and K16 Side effects. Each criterion consists of several attributes (A1 - A35) which are then rated using a Likert Scale. This assessment describes the feasibility level of a contraceptive method.

From the assessment results, an alternative value is obtained for each contraceptive method. This alternative value is then compared with the ideal patient profile using the Profile Matching method. The ideal patient profile is also determined using a rating scale, then profile matching calculations are carried out including calculating GAP, converting GAP values, grouping CF & SF, calculating CF & SF, calculating the total value and finally getting the final score.

RESULT

Alternative Data Analysis

The next step before applying the calculation, first determine the alternatives and criteria obtained from the results of discussions with FKTP 1 Sudirman midwives based on the KLOP KB Wheel. From these results, alternatives are obtained which can be seen in table 1.

Table 1. Alternative Data

Code	Alternative
A1	Combination Hormonal Contraceptive
A2	Progestin Pill Contraceptive (KPP)
A3	Progestin Injectable Contraceptives (DMPA (IM,SC) / NET-EN)
A4	Implant (LNG/ETG)
A5	IUD Levonorgestrel (IUD-LNG)
A6	IUD Copper
A7	Tubectomy (sterile)

Data Analysis Criteria

Criteria are things that are used as determinants in assessing alternatives. The following criteria are obtained from the results of in-depth discussion and analysis with Sudirman FKTP Midwives based on the KB KLOP Wheel. The criteria used can be seen in table 2.

Table 2. Criteria Data

Code	Criteria	Code	Attributes	Value
C1	Hypertension	At1	No History	5
		At2	History of hypertension, but blood pressure < 140/90 without symptoms	4
		At3	Blood pressure 130-139/85-89 (pre-hypertension) or mild fluctuation	3

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		At4	Blood pressure 140-158 / 90-99 or adequately controlled with medication	2
		At5	Blood pressure ≥ 160 / ≥ 100, or uncontrolled despite medication	1
C2	Hepatic disease	At6	No history	5
		At7	Liver tumor	1
C3	Vaginal bleeding of unknown cause unknown cause	At8	No History	5
		At9	History	1
C4	Breast Cancer	At10	No History	5
		At11	History	1
C5	Cervical Cancer	At12	No History	5
		At13	History	1
C6	Disease Cardiovascular Disease	At14	No History	5
		At15	Stroke and Ischemic Heart Disease	1
C7	Pelvic inflammatory disease	At16	No History	5
		At17	History	1
C8	Venous Thromboembolism	At18	No History	5
		At19	History (Acute)	1
C9	Headache (Migraine)	At20	No History	5
		At21	History	1
C10	HIV	At22	No History	5
		At23	History of stage 3 or 4	1
C11	Gonorrhea Chlamydia (Sexually Transmitted Disease) Sexually Transmitted Diseases)	At24	No History	5
		At25	History	1
C12	Age	At26	18 - 45 years	5
		At27	>45 years	1
C13	Smoking status	At28	No Smoking	5
		At29	Smoking >35 years old	1
C14	Breastfeeding Status	At30	Not Breastfeeding	5
		At31	Breastfeeding < 6 weeks	1
C15	Drug Use History	At32	No History	5

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		At33	TB medication (rivamicin) and seizure medication	1
C16	Side Effects	At34	Mild side effects	5
		At35	Severe side effects	1

Based on table 2, it is known that each criterion is given a weight of 5 and each has relevant attributes. These attributes were compiled based on the results of discussions with midwives and information contained in Roda KLOP KB. The assessment of each attribute uses a Likert scale, 5 = can be used, 4 = generally contraceptive methods can be used, 3 = careful / not recommended (unless there is nothing else), 2 = should not be used, 1 = strictly forbidden to use.

Application of Profile Matching Method

Calculation of the profile Matching method to get the final score and ranking. The stage for calculating the Profile Matching method begins with collecting alternative values (A) for each criterion (K), as shown in Table 3 below.

Table 3. Alternative Values

Alternative	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
A1	5	5	1	5	2	5	1	5	5	1	1	5	4	5	5	1
A2	1	4	1	5	1	2	1	4	2	1	1	5	1	2	5	1
A3	5	4	5	5	2	5	1	4	2	1	1	5	1	5	2	1
A4	1	4	5	5	2	2	1	4	2	1	1	1	1	2	2	4
A5	1	4	5	5	5	2	5	4	2	5	5	1	1	1	1	5
A6	1	1	5	1	5	1	5	1	1	5	5	1	1	1	1	5
A7	5	3	2	4	5	2	1	2	1	5	4	1	1	2	5	3

Table 3 is an alternative value table that shows the value of each alternative for each criterion. This value represents the level of alternative suitability for each criterion (for example: a value of 5 can be used). This table is the basis for calculating the difference (GAP) between the ideal profile and the actual value. This value is the result obtained from discussions with midwives based on Rodak Klop KB.

GAP Calculation

The next step is to calculate the GAP, the author uses the ideal profile of patients who have hypertension >= 160 / >= 100 and are breastfeeding <6 weeks.

Table 4. GAP Calculation

Alternative Code	C1	C2	C3	C4	C5	C6	C7	C8	C9	C 10	C 11	C 12	C 13	C 14	C 15	C 16
A1	5	5	1	5	2	5	1	5	5	1	1	5	4	5	5	1
A2	1	4	1	5	1	2	1	4	2	1	1	5	1	2	5	1
A3	5	4	5	5	2	5	1	4	2	1	1	5	1	5	2	1
A4	1	4	5	5	2	2	1	4	2	1	1	1	1	2	2	4
A5	1	4	5	5	5	2	5	4	2	5	5	1	1	1	1	5
A6	1	1	5	1	5	1	5	1	1	5	5	1	1	1	1	5
A7	5	3	2	4	5	2	1	2	1	5	4	1	1	2	5	3
Profile Gap	1	5	5	5	5	5	5	5	5	5	5	5	5	1	5	5
A1	4	0	-4	0	-3	0	-4	0	0	-4	-4	0	-1	4	0	-4

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A2	0	-1	-4	0	-4	-3	-4	-1	-3	-4	-4	0	-4	1	0	-4
A3	4	-1	0	0	-3	0	-4	-1	-3	-4	-4	0	-4	4	-3	-4
A4	0	-1	0	0	-3	-3	-4	-1	-3	-4	-4	-4	-4	1	-3	-1
A5	0	-1	0	0	0	-3	0	-1	-3	0	0	-4	-4	0	-4	0
A6	0	-4	0	-4	0	-4	0	-4	-4	0	0	-4	-4	0	-4	0
A7	4	-2	-3	-1	0	-3	-4	-3	-4	0	-1	-4	-4	1	0	-2

Value Weight Calculation

After obtaining the GAP on the ideal profile, the next step is each contraceptive method (alternative) will be given a weighted value with a benchmark based on the gap value weight table.

Table 5. Calculation of Value Weight

Alternative	**C1**	**C2**	**C3**	**C4**	**C5**	**C6**	**C7**	**C8**	**C9**	**C10**	**C11**	**C12**	**C13**	**C14**	**C15**	**C16**
A1	0	0	-4	0	-3	0	-4	0	0	-4	-4	0	-1	0	0	-4
A2	-4	-1	-4	0	-4	-3	-4	-1	-3	-4	-4	0	-4	-3	0	-4
A3	0	-1	0	0	-3	0	-4	-1	-3	-4	-4	0	-4	0	-3	-4
A4	-4	-1	0	0	-3	-3	-4	-1	-3	-4	-4	-4	-4	-3	-3	-1
A5	-4	-1	0	0	0	-3	0	-1	-3	0	0	-4	-4	-4	-4	0
A6	-4	-4	0	-4	0	-4	0	-4	-4	0	0	-4	-4	-4	-4	0
A7	0	-2	-3	-1	0	-3	-4	-3	-4	0	-1	-4	-4	-3	0	-2
Weight Normalization																
A1	5	5	1	5	2	5	1	5	5	1	1	5	4	5	5	1
A2	1	4	1	5	1	2	1	4	2	1	1	5	1	2	5	1
A3	5	4	5	5	2	5	1	4	2	1	1	5	1	5	2	1
A4	1	4	5	5	2	2	1	4	2	1	1	1	1	2	2	4
A5	1	4	5	5	5	2	5	4	2	5	5	1	1	1	1	5
A6	1	1	5	1	5	1	5	1	1	5	5	1	1	1	1	5
A7	5	3	2	4	5	2	1	2	1	5	4	1	1	2	5	3

Calculation of Core Factor and Secondary Factor

After getting the GAP Value, the next rare thing is to group each alternative as shown in table 6 below.

Table 6. Calculation of Core Factor and Secondary Factor

Criteria		**A1**	**A2**	**A3**	**A4**	**A5**	**A6**	**A7**
CF (90%)	C1	1,5	5	1,5	5	5	5	1,5
	C2	5	4	4	4	4	1	3
	C3	1	1	5	5	5	5	2
	C4	5	5	5	5	5	1	4
	C5	2	1	2	2	5	5	5
	C6	5	2	5	2	2	1	2
	C7	1	1	1	1	5	5	1
	C8	5	4	4	4	4	1	2
	C9	5	2	2	2	2	1	1
	C10	1	1	1	1	5	5	5
	C11	1	1	1	1	5	5	4

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	C14	1,5	4,5	1,5	4,5	5	5	4,5
SF (10%)	C12	5	5	5	1	1	1	1
	C13	4	1	1	1	1	1	1
	C15	5	5	2	2	1	1	5
	C16	1	1	1	4	5	5	3

In this study, the Core Factor is the main factor / main criteria which is given a value of 90% and the Secondary Factor is a supporting factor / supporting criteria which is given a value of 10%. The final value of each alternative is calculated by combining these two values, namely finding the average of each alternative value in CF and SF.

Table 7. SF and CF Values of Ideal Profile

Alternative	CF	SF
A1	2,8	3,8
A2	2,6	3
A3	2,8	2,3
A4	3	2
A5	4,3	2
A6	3,3	2
A7	2,9	2,5

Rating Score

The final result for the profile matching method calculation process is to rank each proposed contraceptive method. The following is the final result of the ranking value in the final profile matching process.

Table 8. Ranking Value

Alternative	NF	Ranking
A1	2,93	4
A2	2,66	7
A3	2,7	6
A4	2,94	3
A5	4,1	1
A6	3,2	2
A7	2,88	5

In table 8 after each contraceptive method gets the final score as shown in the table above, it can be determined the rank or ranking of each contraceptive method based on the highest final score so that the higher the final score, the higher the chance to get the title of the best contraceptive method according to the patient's ideal profile. From the table above, it can be concluded that the contraceptive methods that get the highest final score based on the ideal profile of patient 3 who has pelvic inflammatory disease are as follows

1. Rank 1 : A1 (Combined Hormonal Contraception) which gets a score of 3.8
2. Rank 2 : A2 (Progestin Pill Contraception) which received a score of 3.5
3. Rank 3 : A7 (Tubectomy) which received a score of 3

DISCUSSIONS

This research confirms that the Profile Matching–based model can more effectively address errors in contraceptive selection by calculating the GAP between the patient's actual medical condition and the ideal clinical profile, supported by the weighting of Core and Secondary Factors. Compared to previous studies that employed AHP, TOPSIS, or SAW—most of which used broad criteria such as age,

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number of children, or general medical eligibility—this study offers greater clinical precision by incorporating 16 detailed criteria directly aligned with the WHO KLOP Wheel, including specific levels of hypertension, liver disease, cervical cancer, venous thromboembolism, migraine, pelvic inflammatory disease, sexually transmitted infections, drug interactions, and breastfeeding intervals. This level of detail enables more nuanced GAP calculations and leads to recommendations that are medically safer and better aligned with patient needs.

The findings also indicate that the resulting recommendations are easier for both medical personnel and patients to interpret, thus supporting clearer contraceptive counseling. Importantly, the model's output has been cross-checked with the actual contraceptive decisions made by the attending midwife, showing strong agreement and reinforcing the model's clinical relevance.

Nevertheless, this study still uses several simplified attribute levels within the criteria, meaning that certain medical conditions with multiple severity grades cannot yet be represented in full clinical detail. This simplification was intentionally applied to maintain computational consistency within the Profile Matching framework and is considered acceptable for the exploratory phase of model development.

CONCLUSION

The Profile Matching-based decision-making model successfully provides contraceptive recommendations that match the patient's ideal profile. This model is proven to increase objectivity and accuracy in contraceptive selection, thereby reducing the risk of failure and side effects that often occur due to method mismatch. In addition, this model also has the potential to become a reference in family planning education and counseling, because it is able to present systematic calculation results that remain easy to understand. For future development, this model can be expanded to include psychological factors, patient preferences, and socio-cultural aspects so that the recommendations become more comprehensive.

Furthermore, future studies are encouraged to develop more detailed and granular attribute levels within each medical criterion. This refinement will allow the model to capture variations in clinical severity more accurately and improve the precision of GAP calculations. With more complete and structured attributes, the decision-making process can better reflect real-world clinical complexity, thus strengthening the reliability and applicability of the model in various healthcare settings. Thus, this model is not only useful as a medical tool, but also as a strategic tool in supporting the success of the family planning program and improving the quality of reproductive health in Indonesia.

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