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Combination of Food Nutrition Recommend for Women Healthcare at Menstrual Bleeding

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***Abstract*— One of the regular features of a woman life to menstruation happens 28 days once. Any physical female actives experiences increase her likelihood of experiencing a menstrual cycle. Various challenges are faced by the girls having into account their ages. Women experience a multitude of issues throughout menstruation. is the most serious health concern and there are various types of excessive bleeding. There are three different kinds of bleeding: light, moderate and heavy. Methods for addressing dietary food recommendations time of period difficulties have a proposed. Food nutrition recommendations and menstrual cycles are managed by artificial intelligence technology. This study used the collaborative behaviour filtering method and rule based content filtering to identify problem at the time of bleeding problems also create advice for healthy food from the period one to period three. The food suggestions included banana blossom, honey, cumin, and damask roseMoreover, the future of hybrid recommendation technique and algorithm to absorb the confirmation of food advice and the entire assessment attained 90% of accuracy. The study findings indicate that advice method is identify efficiently and imitative current processes.**

Keywords*— *Women Healthcare, Menstruation cycle Menstrual Bleeding, Combination of Food Nutrition, Collaborative Behavior Filtering Method, Rule based Content Filtering, Future of Hybrid Approval Method.

I. INTRODUCTION.

Advice for women: Adequate nutrition is necessary for human survival and a healthy lifestyle. The nutrients in food help the body's organs grow, stay healthy, and repair themselves. Eating healthy prepares women to better care for themselves, their families, and their children. Women's periods: A significant percentage of females begin menstruating the children's bodyes experience significant physical and emotional changes as they move from adolescents to young adults. It's typical to have female period attend the bourn year of 12 and 16 because everyone's cycle is different. We must figure out how to create an instructive handbook natural biological process uterine tissue blood pass through the female part. The potential conception the ovaries produce two hormones, progesterone and oestrogen. These girls body regulate the uterine lining, or endometrium. Thus a egg is supported. All hormones egg outs from one of the ovaries during ovulation. This egg proceeds down the fallopian tube in preparation for fertilisation. The uterine lining degrades and eventually shedsis needed. It approximately in a month of twenty eight dayto begin to break down and eventually shed. For women, the average menstrual cycle lasts between 21 and 35 days.

Banana blossom- Banana blossoms are calories, fat, fiber, and vitamins and minerals especially beneficial for women's health. Honey- Due to its quick-release sugars, honey can assist fight weariness and low energy. Antioxidant and antibacterial qualities may reduce menstruation discomfort and improve well-being. Cumin- Not only does it have the capacity to alleviate pain, but it also has the ability to improve digestion and possibly even reduce blood sugar levels. It is rich in iron, which is beneficial for menstruation. Damaskrose- During menstruation time foods iron-rich meals to replenish iron lost through blood loss, and consider magnesium for cramp relief. Fig. 1 displays several types of varieties and menstrual periods.

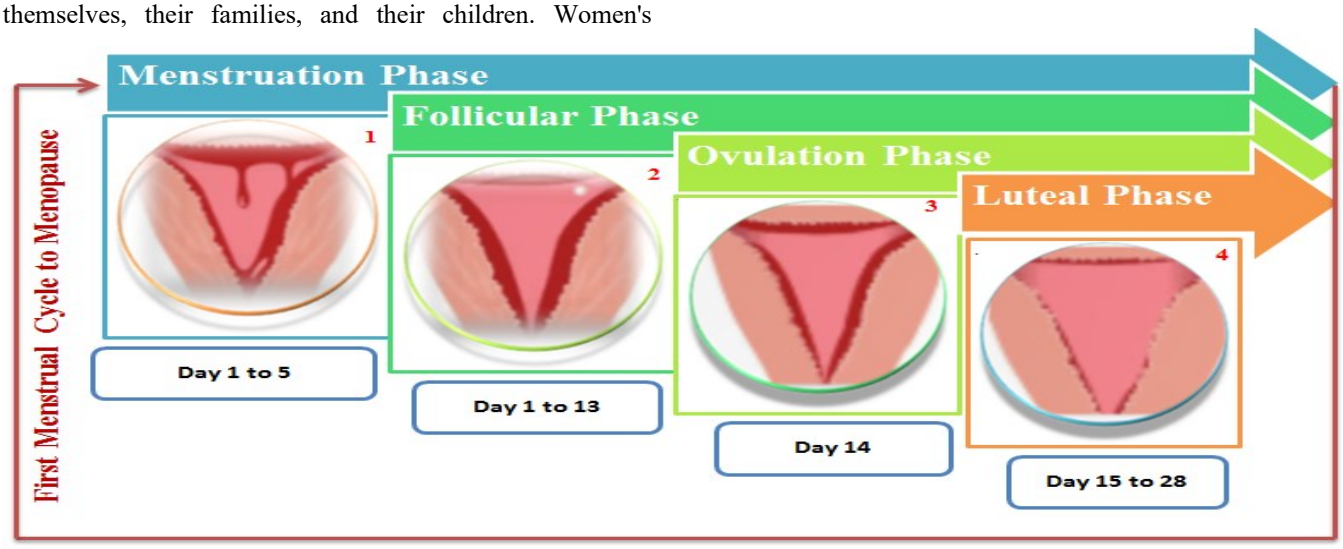

Fig. 1. Menstruation Stage

During the first menstrual cycle: The first day of your period is typically brought up. When a woman's menstrual cycle begins, it continues until the day after her previous menstruation ends. Research based on the menstrual cycle is possible. The uterine lining grows and sheds for 28 days before menstruation begins. When your period starts, your menstrual cycle officially starts. Next, during a normal menstrual cycle—which typically lasts for two to seven days—the uterine lining gives birth and secretes a fluid via the vagina. A thickening of the lining occurs in the days preceding an expected pregnancy. Finally, on the fourteenth day, the process of ovulation begins, and the ovaries release an egg. The eggs may end up lodged in the uterine lining once they get there. Fourthly, because the uterine lining degrades and dissolves, the menstrual cycle might resume even if the egg is not fertilised. This pattern is repeated monthly from the start of menstruation in youth all the way until menopause. The end of the period is near. Most women experience the onset of menopause symptoms, including the cessation of menstruation, in their late forties or early fifties..

Menstrual Phase (Days 1–5): As a result of endometrial shedding during menstruation, endometrial thickness decreases. The vaginal passage allows blood, tissue, and mucus to be expelled from the uterus during this phase. The menstrual cycle officially begins on this day. Proliferative Phase (Days 6–14): High levels of oestrogen drive the endometrium's repair after menstruation. The proliferation of endometrial glands and blood vessels causes a steady rise in endometrial thickness. In this stage, the endometrium is ready for possible embryo implantation. Round day 14, ovulation occurs. This is when the developing egg exits the ovary. Because of the effects of oestrogen, endometrial thickness may continue to increase modestly during this time. Ovulation is a key phase of the menstrual cycle that is required for conception. Secretory Phase (Days 15-28): Following ovulation, the ovary's ruptured follicle becomes the corpus luteum, which produces progesterone. When progesterone and oestrogen levels rise, the endometrium thickens and becomes more vascular, preparing the body for embryo implantation. Early in this phase, endometrial thickness either increases gradually or remains relatively constant. Day 14 is when ovulation happens. The growing egg leaves the ovary at this point. During this period, endometrial thickness may continue to slightly grow due to the effects of oestrogen. One essential period phase needed for fertilisation is ovulation. Secretory Phase (Days 15–28): Becomes more vascular when progesterone and oestrogen levels rise, readying the body for the implantation of an embryo. The endometrial thickness either progressively grows or stays essentially constant in the early stages of this period.

II. Related Works

Several researchers have used ideas from human health to the problem of food nutrition. The literature review is explained in detail below. The study explores how fertility app AI descriptions affect user faith in reliability. Users worry about using such apps for important work owing to hazards. Health goals for AI acceptability, literacy's impact on AI descriptions, and algorithmic health decision-making openness are examined [1]. The levonorgestrel-releasing intrauterine system was shown to reduce blood loss and enhance quality of life in women with hereditary bleeding disorders during severe menstrual bleeding[2]. Exploring psychiatric condition link with menstrual cycle regularity using a mathematical model and decentralised safe learning for privacy. Transfer learning improves IoMT resilience by allowing participants share findings. Decentralised system provides fast, confidential medical record access [3]. Forouzandeh, et al. suggested a dual attention system to analyse heterogeneous networks and offer meals that considers user health and preferences. To recommend healthy, tasty meals, the algorithm considers dish components and relationships[4]. Logapriya et al. suggested This section provides scientifically-backed and individualised food advice for menstrual cycle stages. Pre-existing health and nutrition information helps women make informed decisions to improve their well-being throughout this era. [5]. Angelhoff et al. suggested interviewing Swedish school nurses about what they do to help girls with menstrual discomfort. It highlights their skills, flaws, and viewpoints on this common but under-discussed issue [6].

Mao et al. suggested that lower energy generation in the uterine lining during menstruation may increase blood loss. The study discovered that excessive menstrual bleeding reduced glycolysis, an energy-synthesis enzyme, in women [7]. Dar et al. suggested that poor resources, information, and cultural stigmas cause adolescent girls to struggle with menstrual hygiene and other issues. This brief analysis highlights the challenges and calls for improvements in education, sanitary products, and menstrual attitudes [8]. According to Rakhimova et al., menstruation includes bleeding. Women's bodies change throughout menstruation to prepare for pregnancy. Puberty causes menstruation. Menstruation becomes regular for 1–1.5 years after menarche at 11-14 years [9]. Recommendations that are tailored to the user's likes and preferences that are comparable to their own. User experience is improved, and there is a possibility that sales will increase [10]. Iron deficiency (ID) in adolescents poses challenges due to various factors such as dietary habits, chronic health conditions, and activity levels. Vegetarian or vegan diets require increased total iron intake due to decreased bioavailability of nonheme iron. Those with disordered eating, excessive menstrual bleeding, and certain health conditions are at high risk. Treatment involves oral iron supplementation, ideally administered once daily in the morning, while intravenous iron is considered for severe cases or persistent ID despite oral treatment [11]. Up to 30% of women globally are thought to be affected by HMB, which is characterised over period blood flow of more than 80 millilitres on a monthly basis [12]. The prolonged menstrual cycle and severe blood loss linked to HMB can significantly lower a woman's material, social, emotional, and physical well-being [13],[14]. One common consequence of chronic iron shortage is anaemia. Adenomyosis, fibroids, and coagulation problems are among the diseases that likely to increase the occurrence of HMB in older women [15].

III. Proposed Work

The menstrual cycle was investigated in this study with a particular emphasis placed on the timing of the menstrual process. The study employed a variety of age groups and additional information on the participants. The first step is to identify the various types of challenges that are currently being faced. In addition our technique was broken down into four distinct pieces these groups were determined

by age and previous menstrual cycle health difficulties. In light of the fact that it serves as a template for carrying out any kind of experimental investigation this study highlights the significance of having a method that is prepared for each challenge. Hinders the simplified technique in the stage assessment. The process involves segmenting data into training and validation sets extracting relevant information and preparing the data. It also includes identifying and categorizing issues related to excessive bleeding during the menstrual cycle. This is done using a collaborative behavior filtering method and rule-based content filtering computational methods as well as hybrid models that provide recommendations based on the given conditions. Fig. 2 displays the Recommended Method.

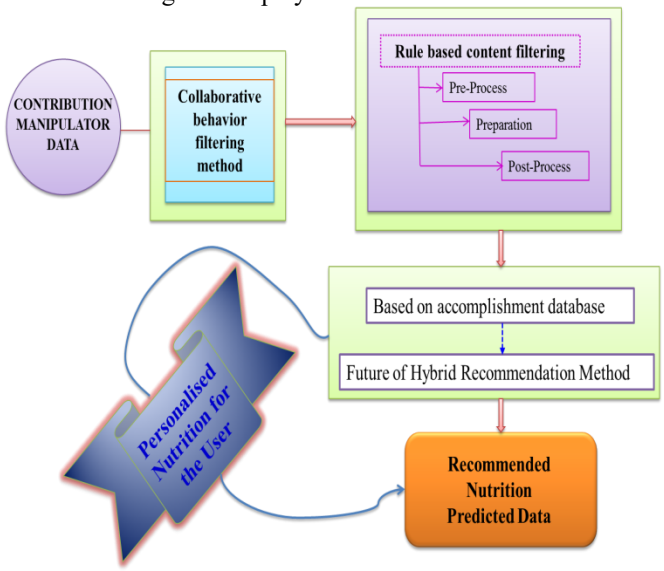

Fig. 2. Recommended Method

A. *Food nutrition recommendation for menstruation that is accompanied by hemorrhage:*

In the future has been established via extensive on the period time problems such as "dysmenorrhea" particularly well-matching for investigation of the intricate aspects of women's health. The majority of people who suffer from these conditions experience symptoms such as back and stomach pain, mood swings, irritability, painful spasms, and excessive menstrual bleeding. Meanwhile reduce the amount of blood that is lost during menstruation it is recommended that one nurture positive emotions and engage in activities that are performed on a daily basis during the duration of this healthcare procedure.

```
Function Get FoodSuggestions(bleedingLevel, dietaryRestrictions)
    if Menstrual (bleedingLevel == "Heavy") then
    suggestedFoods = GetHeavyBleedingSuggestions(dietaryRestrictions)
    else if (bleedingLevel == "Moderate") then
    suggestedFoods = GetModerateBleedingSuggestions(dietaryRestrictions)
    else
   suggestedFoods = [ ]  // No specific suggestions for light bleeding
    endif
    print("Eat smaller meals more frequently throughout the day")
    print("Consult a doctor for iron supplements or severe bleeding")
    print function (heavy bleeding) food suggestion = foods “Banana blossom, Honey, Cumin,Damaskrose”;
    Suggest (heavy bleeding intake foods);
    function suggest( healthy foods);
    return suggestedFoods,
   end function
   function GetHeavyBleedingSuggestions(dietaryRestrictions)
    Showing recommendation of patron (Banana blossom, Honey, Cumin, Damaskrose = total combinations of all four food)
    // Banana blossom- Banana blossoms are good nutrition and all content.
    // Honey- Due to its quick-release sugars, honey can assist fight weariness and low energy. Antioxidant and antibacterial qualities.
    // Cumin- rich in iron
    // Damask rose- foods iron-rich meals to replenish iron lost through blood loss, and consider magnesium
```

B. *Fundamentals of categorization and data splitting*

Given complexities the details collecting technique data extraction is a critical component of any research effort. Excessive bleeding is one of the many issues that women experience during menstruation. The fundamentals of data extraction from age-categorized datasets will be discussed here.

i) Determine the link between the presented data points.

ii) Widely used in recommendation systems to identify products that are similar to user data.

Resemblance of p,d (patron , direction),

$$Resemblanc\ (p,d) = \frac{p,d}{||p|||d||} \qquad (1)$$

Collaborative behaviour filtering collects and analyses the user's stated preferences via ratings suggestions and other activities. In any field it can be used to predict. This approach can be applied to any field where the material's qualities defy straightforward description using the available data. The collaborative behaviour filtering approach uses occupation data as well as user conduct within recommend items to all the patron. In furtherance a matrix is built to demonstrate how users evaluate various goods, reflecting their preferences. User profiles are analysed for similarities in order to make recommendations based on their shared interests and preferences. The collaborative behaviour filtering technique aims to that personalised advise can be made. This technique recognises that there are other ways to compare profiles for similarities.

$$Evaluation\ (p,d) = \sqrt{\sum_{n=1}^{s} (P_h + D_h)^2} \qquad (2)$$

1) Approach, The structure maintains a record of the characteristics and cycles that are selected by users. It is highly recommended that menstrual cycles be allocated numerical values based on the statistics of periodic bleeding. The user has the option of providing either a numerical rating or permitting the system to make its best

opinion of the user enthusiastic opinions regarding the suggest food..

TABLE I. DURING THE MENSTRUAL CYCLE SCALE FOR CLASSIFYING SEVERE BLEEDING IN NUMERICAL USER CLASSIFICATION

Patron (Bourn year changes)	Female patron	Light Bleeding	Moderate Bleeding	Heavy Bleeding
12-18	654	1%	28%	71%
19-23	896	5%	23%	72%
24 -28	735	6%	14%	80%
29-35	1004	9%	10%	81%
36-40	843	5%	11%	84%

In Table I, there are three types of menstrual bleeding problems: the first kind is mild and the second type is moderate the third type is the most difficult for females who are dealing with this health condition since it produces significant bleeding.

2) Patron collaborative Behavior Filtering Method,

- For patron p, find other similar patron.
- Approximation evaluation to patron similar patrons.
- Similar math's and identifying in element model.
- Groupings p evaluation patron, weight similar to p.

$$G_{pd} = \frac{\sum_{w \in N(p,d)} S_{pw}\, G_{pk}}{\sum_{w \in F(u,v)} S_{pw}} \quad (3)$$

Where,

F (p,d), F- Fresh, set of patron evaluated d and similar in p,

S_{pw} Similar of patron p and w,

G_{pw} Grouping of element p on patron w.

C. Information development through content screening rule application

Rule-based content filtering recommender systems incorporate the user's dietary preferences and historical interactions with healthy food choices and nutrition plan composition when making recommendations. User and nutritional food profiles can be created using rule-based content filtering. This technique finds comparable products that match their preferences. Pre-processing datasets before training the model improves reliability and efficiency. Finding significant user adaptability through rule-based collective filtering. Data preparation involves the use of related concepts and sampling to choose a dataset from a large number of people. After that determine the material and data analysis, authenticity verification users can use similarities to make decisions. Recommender systems employ user data to recommend products. They use this method often through repetition and consistency focused practice improves skill competency. The best way is to find nutrition product qualities that match consumer preferences and then compare them. The user may first see multiple results from different methods should choose one that matches their experience. Further the system can remember the user previous choices and apply them into their current input.

$$Personalized\ (p,d) = \frac{\sum_{h=1}^{s}(p_h - \bar{p}(d_h - \bar{d}))}{\sqrt{\sum_{n=1}^{s}(P_h + \bar{p})^2}\ \sqrt{\sum_{n=1}^{s}(d_h + \bar{d})^2}} \quad (4)$$

TABLE II. NUMERICAL PREDICTION OF RECOMMENDED COMBINATION FOOD FOR MENSTRUAL OVER BLEEDING

Patrons	patron count	10g (10*rating)	25g (10*rating)	50g (10*rating)
Mens. Cycle1	1645	1	1	8.3
Mens. Cycle 1to2	1256	2	4	8.8
Mens. Cycle 1to3	1810	3	5	9.8
patron prepossession	4711	20%	33%	90%

Regarding the table II, the women of the patron prepossession used a combination of nutrition food with amounts of 10g, 25g, and 50g. The issue that the patron faces with excessive bleeding was addressed by utilizing menstrual cycles. Food nutrition guidelines during the menstrual cycle are provided along with the corresponding health content in grams. Out of 10, the customer is recommended to take 10g, 25g, and 50g for one to three menstrual cycles.

Patron prepossession magnitude = $\sum_{n=1}^{e} N_q\ P_q$ (5)

Where,

N_f is the nutrition food value and P_f patron prepossession significance in Colum q.

D. Locating and merging engine records based on accomplishments database:

Only data identifications will remain after pre-processing and data extraction are done. The primary goal of this study is to identify the most common issues faced by women during menstruation time light, moderated and heavy bleeding and then use this information to drive a cooperative behaviour filtering technique. The next step is to thoroughly list all of the problems that arise when women experience excessive bleeding during menstruation and identify which ones are the most bothersome.

E. Method for personalized final categorization it is suggested to utilize hybrids

The obtained data can be used in order to give the user with the most comfortable experience that is within their capabilities. It is recommended that the hybrids advised technique be utilized in this scenario for the purpose of controlling bleeding during menstrual cycles. This article

offers several options for foods, including damask rose, honey, cumin, and banana blossoms, among others.

IV. Results and Discussion

The analysis utilized programming language Python 3.9 and open AI Pyth-lib as implements. A testing setup was utilized, consisting the AMD-Intel and i7 function OS at a frequency of 2.20GHz, along with towel gigabyte of RAM also two gigabyte GC. For the application of female period and bleeding utilize the open AI framework. The widely-used API can be utilized in conjunction with the suggested approach to evaluate the dataset on menstrual bleeding. In order to find outcomes to the problems associated with menstruation, the research utilized a collaborative behavior filtering approach in conjunction with rule-based content filtering. The findings were then quantified using the algorithm of the future of hybrid recommendation method and resulting in a proposed percentage value.

Nutrition recommendation generate,

$$Calculated_{Sum(p,d,s)} = \sum_{h=1}^{s} P_h + D_h + S_h \quad (6)$$

P- Patron profile, D Direction of recommendation, S Selection of menstrual bleeding cycle and process. Fig. 3 shown the combination of food nutrition preparation method.

Fig. 3. Combination of food nutrition preparation method

Banana blossom, honey, cumin, and damask rose cuisine are ingredients that have been used for centuries as a powerful. Additionally, these ingredients have been shown to reduce bleeding during menstruation. Any contaminants can be removed from the banana flower, honey, cumin, and damask rose by thoroughly cleaning them thoroughly. Place all of the ingredients in a single bowl and pronounce the following: "This combination of food during the first three days of your cycle." The menstrual cycle, as well as the subsequent three days. At the very beginning of the day, after you have washed your head, you are required to consume this food. (In order to keep your body temperature at a cool level). You should not add anything further to the mixture of healthy foods. Except for water, there should be no consumption of any food or drink for the next hour. For the duration of this treatment, you should avoid eating anything that is spicy or oily. The fact that it is a powerful therapy will undoubtedly result in an improvement in your health after three sessions. You are able to repeat the process of subsequent phase is required.

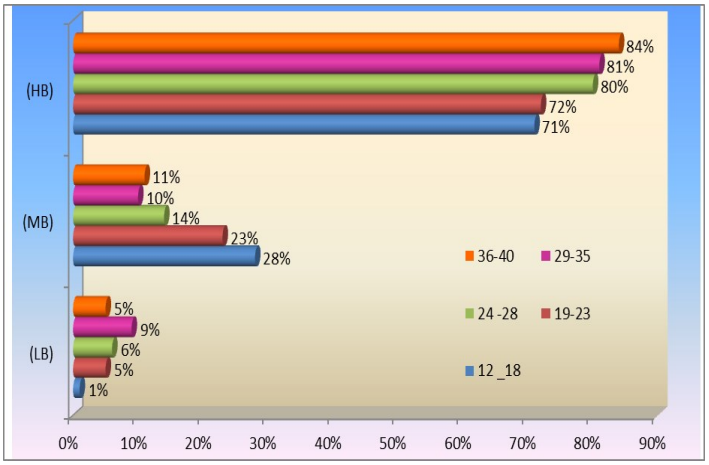

Fig. 4. During Menstruation time major problem

Figure 4 displays several levels of bleeding: light, moderate, and severe. This is a typical symptom experienced during menstruation. Regarding excessive menstrual bleeding the following age groups of women are included: The percentages are as stated: The percentage of girls aged 12-18 is 71%, for those aged 19-23 it is 72%, for those aged 24-28 it is 80%, for those aged 29-35 it is 81%, and for those aged 36-40 it is 84%.

Using the bleeding average feedback rating for each menstrual cycle.

$$R = \frac{G_m + S_b}{m + b} \quad (7)$$

G-Grouping concepts, Menstrual, Bleeding allocation based food nutrition rating recommendations.

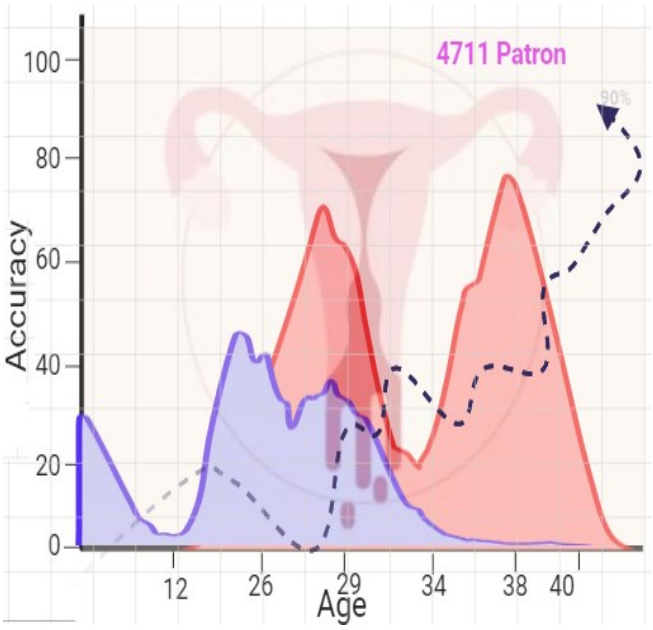

Fig. 5. Combination of Nutrition Recommendation Performance Estimate

In Fig. 5, a comprehensive report was conducted on menstruation duration with significant of bleeding process. The analysis of 4711 data sets revealed that a combination of 10g, 25g, and 50g of nutrition intake as recommended by female users was shown to be effective in improving menstrual cycles. The evaluation was based on the opinions of female patrons over a span of three menstrual cycles with a success rate of 90 percent. This dataset on menstruation information was also acquired from Kaggle.

V. Conclusion

This research was performed in relation to the menstrual cycle focusing on the experiences of women who suffered from excessive bleeding issues and the phases of their exposures. In addition to rule-based content filtering and Collaborative behavior filtering method to the integration of a future hybrid recommendation method based on algorithms this study utilised 4711 datasets from women of different ages throughout their menstrual cycles. Moreover, to identify the nutritional deficiencies and offer suggestions for optimal nutrition from the cycle 1 to cycle 3 and the implementing artificial intelligence technology based on Python to the research as a whole attained a recognition accuracy of 90%. For women health issues in the future it will be important to have nutrition and calorie information based on different age groups and propositions for traditional foods to eat after menstruation will be required based on the female problems.

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