Lack of Nutritional Intake in Women Increases the Risk of Menstrual Disorders in Agricultural Areas

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Abstract

Introduction: Nutritional intake is crucial in maintaining overall health, particularly women's reproductive health. Inadequate nutrition can lead to various menstrual disorders, such as menstrual pain, anemia, and amenorrhea. Addressing these issues is vital for improving women's health. Objectives: To examine the impact of inadequate nutrition on menstrual health, identify critical nutritional deficiencies contributing to menstrual disorders, and suggest potential interventions to improve women's reproductive health and overall well-being in agricultural areas. Methods: This study uses the PRISMA method to review 9.913 articles in total with the following details: 8,900 articles found on Google Scholar, 896 articles on Pubmed, and 7.292 articles on ScienceDirect. Ten relevant ones highlighted the significant impact of inadequate nutrition on menstrual health among women in agricultural areas. Results: Inadequate nutritional intake significantly impacts menstrual health, leading to disorders such as amenorrhea and anemia among women in agricultural areas, emphasizing the need for improved nutrition and food security in this population. Conclusion: The review of the studies shows that poor nutrition and harsh working conditions in agricultural areas lead to menstrual disorders, highlighting the need for improved nutrition, education, and working conditions to enhance women's reproductive health and overall well-being.

Keywords: *menstrual disorder; nutritional intake; women; farmer*

INTRODUCTION

Menstruation is a periodic bleeding experienced by women in their reproductive cycle, starting from menarche. Normal menstruation is crucial for assessing fertility, conception, or infertility disorders in women. During menstruation, several disorders, known as menstrual disorders, can occur, including dysmenorrhea, amenorrhea, polymenorrhea, oligomenorrhea, hypermenorrhea, hypomenorrhea, and metrorrhagia. These disorders often lead women to seek medical attention, with complaints varying from mild to severe, sometimes causing frustration. Data from several industrialized countries indicate that a quarter of women have experienced menorrhagia or hypermenorrhea, 21% complain of shortened menstrual cycles, 17% experience metrorrhagia, and 6% complain of post-coital bleeding. Apart from causing health issues, menstrual disorders also impact daily activities[1,2].

Several factors contribute to menstrual disorders, including internal and external factors. Internal factors such as reproductive organs, hormones, and diseases play a role, while external factors like nutritional status and lifestyle also influence menstruation. Nutritional

status intake reflects an individual's body condition based on nutrient consumption and utilization. Excessive or insufficient nutrient intake can disrupt the menstrual cycle, with carbohydrates, proteins, and fats playing crucial roles during menstruation. Inadequate nutrition affects organ function and growth and disrupts reproductive functions[3,4].

Currently, women working in the agricultural sector are increasingly common. However, despite this trend, women inherently differ from men physically and biologically, necessitating accommodations for specific conditions such as pregnancy, childbirth, postpartum, breastfeeding, and other reproductive health conditions[5]. Moreover, inadequate nutritional intake among women in the agricultural sector can lead to menstrual disturbances, potentially resulting in decreased work productivity[6].

From research, it was found that some workers have experienced reproductive health disorders, such as prolonged menstrual cycles and excessive fatigue during menstruation while working. Additionally, almost all of them have abnormal nutritional status. This situation poses significant potential harm to female workers[1,7]. Therefore, researchers are interested in analyzing the relationship between nutritional status and menstrual disorders among women working as farmers or living in agricultural areas.

METHOD

This study is based on a literature review titled "Lack of Nutritional Intake in Women Increases The Risk of Menstrual Disorders in Agricultural Areas." This study used the Preferred Reporting Items for Systematic Reviews and Meta-analyse (PRISMA) method. Also, this research was carried out systematically and correctly by following the correct stages, including (a) Defining the Topic, (b) Determining the Source of information, (c) Selecting relevant literature, (d) Collecting Articles, and (e) Analyzing Articles[8].

It was based on the screening process through the use of several Indonesian keywords, including "Nutrisi," "Menstruasi," and "Petani." As well as in English, including "Nutrition," "Menstrual," and "Farmer." There were 9.913 articles with the details: 8,900 articles found on Google Scholar, 896 articles on Pubmed, and 7.292 articles on ScienceDirect. This screening process uses some criteria divided into inclusion and exclusion.

The inclusion criteria such as:

1. Articles published between 2019-2024
2. Articles study based on relevant title
3. Articles are complete texts with abstracts
4. The article contains keywords in it

The exclusion criteria such as:

1. Articles published before 2019
2. The article does not provide full text or an abstract
3. The article does not contain keywords in it

4. The article cannot be accessed

After that, screening was carried out with the inclusion and exclusion criteria, finding as many as 7.898 articles with publication in 2019-2014, with details of 7,600 from Google Scholar, 181 from Pubmed, and 117 from ScienceDirect. This article selected some exceptions, and we found that 4.551 were not study articles, 2.968 titles were irrelevant, and 272 were inaccessible. There is also a filtration that aims to select study articles, as it was found that 113 articles are study-based.

The screening process continued by selecting more exceptions to collect the specific articles. The exceptions from the 113 articles include 89 articles without abstracts and 35 articles that do not provide full text. They were also appropriate to this research, so ten articles were found for further analysis. In addition, all ten articles to be analyzed are full-text articles with abstracts and can be accessed for free and can be accounted for their credibility. Further explanation of this screening process can be seen through the diagram below.

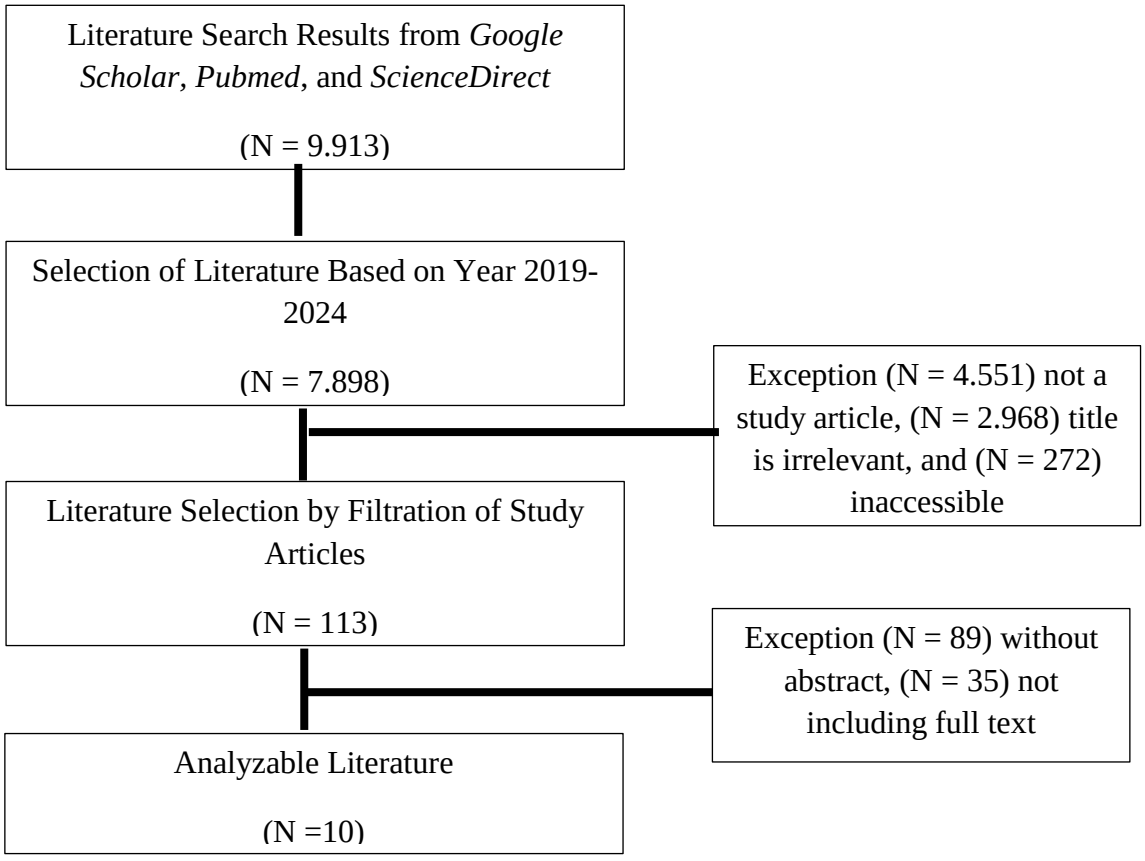

Figure 1 Analysis diagram based on PRISMA (2009)

RESULT

From the article search results, seven articles were found with a research design in the form of a cross-sectional study and three other articles used a literature review research design. The chosen research design focuses on articles examining whether the lack of nutritional intake in women from agricultural areas can increase the risk of menstrual disorders. Of the total of ten articles selected, three articles came from Indonesia and seven articles from abroad. All articles indicate that lack of nutritional intake can increase the risk or even cause menstrual disorders in women from agricultural areas. A more complete explanation can be seen in Table 1 of the list of search result articles.

Table 1. List of Search Results Articles

No	Author and Journal Identity	Journal Title	Objective	Population and sample	Method	Result
1	**Author:** Erye et al. **Journal Identity:** MIKIA Mimbar Ilmiah Kesehatan Ibu dan Anak (Maternal and Neonatal Health Journal)/ 2021/ 40-48 (2021)	The Relationship Between Food Consumption Patterns and Menstrual Cycles[9]	To Examine how food intake habits correlate with the menstrual cycle among teenage girls at Al-Mizan Islamic Boarding School in Lamongan.	The study focused on adolescents aged 15-18 residing at Pondok Pesantren Al-Mizan in Lamongan. The area primarily comprises civil servants (PNS) and some farmers. With a total student population of 148, a Stratified Random Sampling method was used, resulting in 108 respondents meeting the inclusion and exclusion criteria.	The research employed an analytical observational method with a cross-sectional approach conducted in June 2021. Data were collected and analyzed using the Statistical Package for the Social Sciences (SPSS) version 21, both univariately and bivariately. The analysis utilized the chi-square statistical test with a confidence level of 95%, comparing the significance value with α = 0.05. Results were deemed significant if p < α.	Most adolescents were 16 (29.6%) and 17 (31.4%) years old, with varying nutritional statuses. The average energy adequacy level was 62.70%. While 79 respondents had dietary consumption patterns indicating a weight deficit, 105 exhibited good eating patterns, with 68.5% having regular menstrual cycles. Statistical tests using SPSS indicated no significant relationship between food consumption patterns and the menstrual cycle (p=0.896) or between the type of food consumption patterns and the menstrual cycle (p=0.972) among adolescent girls at Pondok Pesantren Al-Mizan Lamongan. Thus, it can be concluded that neither the quantity nor the type of food consumption affects the menstrual cycle pattern in adolescents.
2	**Author:** Ibrahim. Z. A **Journal**	Food Consumption Behaviour: A Case	To investigate the dietary habits of rural	The study selected a sample of 225 small-scale farmers across	Farmers in Kedah State were selected through a stratified random sampling	The study indicates that food consumption among rural farmers in Kedah, Malaysia, is minimal, with nearly 40% of their income dedicated to

	Identity: Russian Law Journal/ 2023/ 9(4)/ 86-96 (2023)	Study Among Farmers in Rural Area Kedah, Malaysia[10]	residents in a remote community in Kedah, Malaysia.	five districts in Kedah State: Baling, Kuala Muda, Alor Setar, Pendang, and Kubang Pasu.	method. The survey, conducted in the Malay language, included a variety of question formats such as a five-point Likert rating, open-ended questions, and countable options. Face-to-face discussions were held with selected rice farmers in specific areas to administer the survey. Data analysis was performed using SPSS Statistics version 25, and food choices were presented as qualitative statistics, expressed as means.	acquiring basic household food necessities. Despite allocating a significant portion of their income, many farmers purchase inexpensive fish or vegetables of unsatisfactory quality. Moreover, certain beliefs regarding food's impact on health lead some households to abstain from consuming certain items, a practice that spreads to other households. Convincing this group of the importance of a balanced diet proves challenging due to entrenched beliefs, ultimately negatively impacting their health. One of the negative impacts is a menstrual disorder, and the general happening is an increase in menstrual bleeding.
3	**Author:** Naraoka et al. **Journal Identity:** Healthcare (Switzerland) 11(9): 1–14. (2023)	Severity of Menstrual Pain Is Associated with Nutritional Intake and Lifestyle Habits[11]	To investigate the relationship between lifestyle habits, nutrient intake, and the severity of menstrual pain in Japanese women aged 20-39. Including the role of protein, vitamins D and B12, and habits like breakfast consumptio	The population for this research consisted of healthy women aged 20-39 years. The study sample comprised 321 participants who met the inclusion criteria, underwent body composition measurements, and completed dietary and lifestyle questionnaires at the study venue.	The research conducted in the article utilized a cross-sectional study design. Participants were recruited online, underwent body composition measurements, and completed dietary and lifestyle questionnaires at a specific venue for data analysis.	The research found that lifestyle habits such as the frequency of eating breakfast, bathing, and satisfaction with sleep were related to menstrual pain in women aged 20-39. Specifically, skipping breakfast was associated with a higher likelihood of experiencing menstrual pain. This research is relevant to farmers as it highlights the importance of maintaining healthy lifestyle habits, including regular meals and adequate sleep, in managing menstrual pain and related symptoms. Farmers can improve their overall well-being and productivity by promoting good lifestyle practices.

			n and bathing.			
4	**Author:** Alemu et al. **Journal Identity:** *PLoS ONE* 16(8 August): 1–19. http://dx.doi.org/10.1371/journal.pone.0254166. (2021)	Under Nutrition and Associated Factors among Adolescent Girls Attending School in the Rural and Urban Districts of Debark, Northwest Ethiopia: A Community-Based Comparative Cross-Sectional Study[12].	To assess and understand the prevalence of undernutrition, specifically stunting and thinness, among adolescent girls in Debark district, Northwest Ethiopia, and to identify the associated factors contributing to these nutritional issues.	The study population consisted of all school-going adolescent girls from rural and urban schools in Debark district, Northwest Ethiopia. A total of 757 adolescent girls participated in the study, with a response rate of 95.6%. The sample size was determined to be 792 adolescent girls, with 396 selected from rural schools and 396 from urban schools, using a multistage sampling technique.	The study was conducted on 792 adolescent girls using a multistage sampling technique. Data collection involved face-to-face interviews and anthropometric measurements. Statistical analyses were performed using SPSS, with significant factors identified through logistic regression. The study aimed to understand factors influencing undernutrition among adolescent girls in the community.	This finding is significant for farmers as it highlights the importance of addressing nutritional needs during the critical period of menstruation, especially for adolescent girls from agricultural areas who may already be vulnerable to undernutrition due to limited access to diverse and nutritious foods. Providing strategies such as iron supplementation, food fortification, and ensuring adequate nutrition during menstruation can help prevent stunting and improve the overall health of adolescent girls from farming backgrounds
5	**Author:** Chandra, N., & Parvez, R. **Journal Identity:** International Journal of Applied Social Science 6(7), 2019, 1837-1839 (2019)	Awareness of Reproductive Health Problems of Farm Women[13]	This study aims to prove that education makes them aware of good dietary and health practices.	The study was carried out by taking a sample of 75 female farmers in the age group 20-45 years, who were randomly selected from five villages in the Loni block, Ghaziabad district. Twenty-five respondents were randomly selected from each village.	This study adopted a simple random sampling to identify the reproductive health problems of farm women. A survey method was employed to collect the data. A self-structured interview schedule was employed to assess farm women's nutritional knowledge and reproductive problems. The statistical measures used for analysis were frequency and	The study revealed that the majority of the farm women were facing various reproductive and menstrual problems like painful menses, anemia, heavy bleeding, leucorrhea, reproductive tract infection, burning sensation, and miscarriages. Hence, to improve rural women's knowledge, educating and training them about nutrition and reproductive problems is essential. The study revealed that most farm women were unaware of the importance of a balanced diet. Asha workers and hospitals were the primary source of nutritional and health knowledge.

					percentage distribution.	
6	**Author:** Rohmah, S., & Rusady, Y. P. **Journal Identity:** *SAKTI BIDADARI (Satuan Bakti Bidan Untuk Negeri)*, *4*(2), 2021, 71-77. (2021)	The relationship between nutritional status and the incidence of amenorrhea in students of SMP Negeri 1 Pademawu. [3]	This study aimed to determine the relationship between nutritional status and the incidence of amenorrhoea in female students at SMP Negeri 1 Pademawu based on age, parental education, and parental income level.	The population in this study were all 63 class VIII female students at SMPN 1 Pademawu. In this study, researchers used probability sampling with a simple random sampling technique. The samples taken in this research were all 55 class VIII female students at SMPN 1 Pademawu.	This is a correlative analytical research consisting of independent and dependent variables. Meanwhile, based on time, this research is a cross-sectional study.	There is a moderate relationship between nutritional status, parental education, parental income level, and father's occupation with the incidence of amenorrhoea in female students at SMP Negeri 1 Pademawu Class VIII, Pademawu District, Pamekasan Regency. Working as a farmer relies only on the results of the harvest , so the results obtained sometimes differ from what was expected. So, they must be able to organize their family according to their family's daily needs.
7	**Author:** Indriyanti **Journal Identity:** Medical Technology and Public Health Journal, 3(1), 2019, 54-60. (2019)	Nutritional Status and its Relationship with Menstrual Disorders among Tobacco Farmers in Ambulu Village, Ambulu District, Jember [1]	This study aimed to analyze the relationship between nutritional status and menstrual disorders in tobacco farmers in Ambulu Village.	The population in this study were 39 female workers on the tobacco farm in Ambulu Village, Ambulu District, Jember Regency. The number of research samples was taken from the entire existing population.	This research is a type of observational research. It is descriptive research based on the nature of the problem and data analysis. In terms of time, this research is cross-sectional. The research was conducted from May to August 2018.	Most of the tobacco farmers in Ambulu Village, Ambulu District, Jember, experienced menstrual disorders, namely 26 people (66.7%). The nutritional status assessment showed that most respondents had abnormal nutritional status, both underweight and overweight, and 20 people (51.2%). From the results of statistical tests, the contingency coefficient value is 0.436. So, it was concluded that there was a strong relationship between nutritional status and menstrual disorders in tobacco farmers in this village.
8	**Author:** Yaşar, G., & Koruk, F. **Journal**	Does Working in an Agricultural Area Affect Menstrual	The study was carried out to determine the menstrual	The sample size was calculated as 369 people with a confidence level for the	This cross-sectional study was carried out between February and March 2014 in Sanliurfa, a city	Young SAWs have more MCP during the times they are working in agriculture than when they are at home. Factors such as excessive fatigue, poor harboring and

	Identity: International Journal of Health Sciences & Research, 8(12), (2019)	Cycle? A Cross-Sectional Study from Turkey[14].	cycle problems of young seasonal agricultural workers and the factors affecting these problems.	frequency of menstrual cycle problems. One hundred people from the Yenice neighborhood and 269 people from the Hayati Harrani district. The study population was young women, aged between 15-24 years, who were not married and were SAWs.	in the Southeastern Anatolia region of Turkey. In a study conducted by the State Planning Organization, Sanliurfa was ranked 73rd out of 81 cities in terms of its socioeconomic development.	uncomfortable living conditions, poor nutrition, extreme heat, and cold exposure may lead to MC disorders in female agricultural workers. Having chronic illnesses and not having shade while resting in the agricultural lands were determined as prominent factors that increased MCP during the period when SAWs worked in agricultural areas.
9	**Author:** Djunaid, U., & Hilamuhu, F. **Journal Identity:** Jurnal Komunitas Kesehatan Masyarakat (JKKM) 3 No 2. (2021)	Literature Study: Relationship between Menstrual Pattern and Iron Consumption Level with Anemia Incidence in Adolescent Girls[15].	This study aims to determine the relationship between menstrual patterns and iron consumption levels with anemia among adolescent girls.	The sample of articles used a descriptive narrative design with a literature review approach. approach.) The data sources used are from research journals that have been previously researched. Previously, this study used six journa**ls.**	The method used in the article is a descriptive narrative design with a literature review approach. The data used came from research journals that had been conducted previously. This study analyzed six journals discussing the relationship between menstrual patterns, iron consumption levels, and anemia in adolescent girls.	The results of the article show that inadequate iron intake can lead to menstrual disorders in women, particularly in adolescent girls. This emphasizes the importance of proper nutrition, including iron consumption, in preventing menstrual disorders in women in agricultural areas. The article also shows that low iron consumption levels can increase the incidence of anemia in adolescent girls. Anemia in adolescent girls is influenced by the menstrual cycle, length of menstruation, volume of menstrual blood, and iron consumption. In addition, anemia is caused by several other factors, namely direct and indirect factors. Direct factors include infections caused by hookworms, malaria, and tuberculosis, while indirect factors include low socioeconomic conditions, education level, and poor nutritional knowledge.
10	**Author:** Yuliarti, Y. Y., et al. **Journal Identity:**	Differences in Secondary Sexual Growth Rate and Menarche	This study aims to analyze the differences in secondary sexual	The population in this study were all fifth and sixth-grade female students from 14 primary schools in	This article uses an analytical observational method with a cross-sectional approach. The subjects were 168	The results of this study were based on BMI/U; the underweight group was mostly at stage 1-2 breast growth (70%) and breast growth (70%). The underweight group was

Avicenna : Jurnal Ilmiah, 15(2), 95-104. (2020)	Based on Nutritional Status of Adolescent Girls in Pasar Manna Sub-district, South Bengkulu Regency[16].	growth rate (breast and pubic hair) and menarche status based on nutritional status groups of body mass index according to age (IMT/U) and height according to age (TB/U).	Pasar Manna Sub-district, South Bengkulu Regency, in the 2012/2013 academic year, totaling 470 students. The sample in this article was selected based on inclusion criteria (adolescent girls aged 11-12 years) and exclusion criteria (adolescent girls with chronic diseases, reproductive organ abnormalities, and high-stress levels). This study used a purposive sampling technique involving 168 female students from eight Pasar Manna Sub-district, South Bengkulu Regency primary schools.	adolescent girls from 8 elementary schools, grouped based on IMT/U and TB/U nutritional status. Using body scales, microtome, questionnaires, and Tanner Scale. Data analysis using Kruskal wallis, Post-hoc LSD, Mann Whitney, and Chi-Square tests.	mostly at stages 1-2 of breast growth (70%) and pubic hair growth (80%), while the overweight group was mainly at stages 4-5 of pubic hair growth (80%). Pubic hair growth (80%), while the overweight group mainly was at stage 4-5 breast growth (84%) and stage 3 pubic hair growth (52%). In the normal group (based on BMI/U and TB/U), the breast growth rate was stage 4-5 (72%) and stage 3 pubic hair growth (72%). Based on TB/U, the stunted group was mostly at stages 1-2 of breast growth (56%) and pubic hair growth (84%). The percentage of early menarche based on BMI/U in the underweight, normal, and overweight groups was 14%, 30%, and 38%, respectively. In the stunted group, the percentage of early menarche based on TB/U was 6%. There was a significant difference in the rate of secondary sexual growth (breast and pubic hair growth) based on IMT/U and TB/U nutritional status (p=0.001). There was a significant difference in menarche status based on IMT/U (p=0.023) and TB/U (p=0.002).

DISCUSSION

Nutritional status is the body's state due to food and nutrient consumption. Nutritional status is an important part of a person's health. Inadequate nutrition will affect growth and organ function and disrupt reproductive function. This has an impact on menstrual disorders, including amenorrhoea, but will improve if the nutritional intake is good[3,17]. Food consumption patterns and nutritional status strongly influence women's reproductive health. Inadequate nutritional intake can cause disruptions in the menstrual cycle, especially among women living in less favorable economic conditions, such as agricultural areas. This discussion examines the impact of inadequate nutrition on women's menstrual health in

agricultural areas based on a literature review of ten relevant articles. A study from Erye et al. (2021), which analyzed food consumption patterns and menstrual cycles, showed that sudden changes in diet can affect the menstrual cycle. The prevalence of menstrual disorders was higher in young women with malnutrition, which was 40.3% in those with severe malnutrition, 52.8% in those with undernutrition, and 6.9% in those with overnutrition. These findings suggest that inadequate nutritional intake may cause stress on the body and affect menstrual health[9].

Other than that, the food consumption patterns of people who lived in agricultural areas were low[18]. This is amplified by a study by Ibrahim (2023) that studied the food consumption patterns among farmers in Kedah, Malaysia and found that the food consumption value is below 29.9. Low-income people with limited access to nutrition experience food security problems caused by rising living costs and limited income[10]. This finding supports research by Erye et al. (2021), highlighting that limited access to nutrition, especially among women in agricultural areas, may contribute to menstrual disorders. Some things that should be highlighted about the causes of menstrual disorders are low awareness[9]. As mentioned in a study by Chandra and Parvez (2019), women from agricultural areas have low awareness of the importance of a balanced diet among farm women; only 22% were aware of this. In addition, the article notes various reproductive health issues such as menstrual pain, anemia, and menstrual cycle disorders, all of which are likely related to inadequate nutritional intake[13]. This aligns with research by Erye et al. (2021) and Ibrahim (2023), showing that poor nutrition affects menstrual health[9,10].

Another perspective was found that other things are also known to cause menstrual disorders. Research conducted by Yaşar (2019) mentions that poor working conditions in the agricultural sector, including sun exposure and inadequate working environment, affect the menstrual cycle. Although the main focus of this article is not on nutrition, poor work environment conditions can exacerbate health problems caused by low food intake, supporting the finding that the work environment also plays a role in women's menstrual health in agricultural areas[14]. According to Rohmah (2021), one type of menstrual disorder commonly known as amenorrhea can be suggested by external factors such as nutrition and lifestyle that contribute to menstrual disorders. This shows that there is a moderate relationship between nutritional status and the incidence of amenorrhoea. This finding is consistent with previous studies that show the importance of nutritional status in menstrual health[3].

Other studies have also been found to support that one of the causes of menstrual disorders is a lack of nutritional intake. Some of them are research conducted by Indriyanti (2019) studying tobacco farmers in Ambulu Village found that 66.7% of respondents experienced menstrual disorders, with most having abnormal nutritional status[1]. These

results reinforce the finding that a lack of nutritional intake contributes to menstrual disorders, consistent with research by Erye (2021), research by Ibrahim (2023), and research by Chandra (2019). Besides that, research by Djunaid (2021) discussed the relationship between menstrual patterns and iron consumption with the incidence of anemia in adolescent girls. Although not specific to women farmers, this article is relevant as anemia can affect menstrual health. This supports the finding that nutrient intake, particularly iron, is essential for menstrual health, which aligns with other findings[15].

Research conducted by Yuliarti (2020) added the importance of education and economic factors in influencing nutritional status. Mothers with higher levels of education tend to have better nutrition knowledge, which affects their mindset and behaviour in meeting the family's nutritional needs. In contrast, mothers with primary education may need help understanding the importance of balanced nutrition. This has an impact on the nutritional status of their children, including adolescent girls, who may experience menstrual disorders due to inadequate nutritional intake. Family income also plays a vital role in nutritional status. Families with low incomes often have to organize their living needs according to their income levels, which means food needs may only sometimes be well met. Farming jobs that rely on erratic harvests add to the economic burden, affecting the family's ability to provide adequate nutrition. In addition, the study highlights the risk of diet pill use and extreme diets that can lead to amenorrhea and other menstrual disorders. Too low body weight, often resulting from an unhealthy diet, can inhibit hormonal function and halt ovulation, suggesting that nutritional balance and good nutritional status are essential for maintaining reproductive health[16].

Based on research conducted by Alemu and Ayele (2021) found that adolescent girls from farmer mothers were nearly three times more likely to be thin compared to those from merchant mothers. This suggests that undernutrition is associated with the mother's occupation, potentially due to factors like laborious work and lack of knowledge about adolescent nutrition. Regarding menstrual disorders, the study revealed that adolescent girls aged between 14 and 15 at first menstruation were three times more likely to be stunted compared to those aged 16-17 at first menstruation. Early initiation of menstruation can lead to increased iron losses, reduced bone mass, and decreased appetite, contributing to undernutrition among adolescent girls. Therefore, the research indicates a relationship between undernutrition and menstrual disorders in women from agricultural areas, highlighting the importance of addressing nutritional needs during menstruation to prevent undernutrition and improve the health of adolescent girls[12].

The above is also supported by research from Naraoka et al. (2023), who found that lifestyle habits such as skipping breakfast, bathing, and satisfaction with sleep were related to the severity of menstrual pain in women aged 20-39. Specifically, lower intake of animal

proteins, vitamin D, and vitamin B12, as well as infrequent breakfast consumption and bathing, were associated with heavier menstrual pain. Regarding undernutrition and menstrual disorders in women in agricultural areas, while the specific relationship was not addressed in the article, it is known that undernutrition can impact women's health and reproductive function, potentially contributing to menstrual disorders. This study is in line with other research, which includes undernutrition and menstrual disorders in women in agricultural area[s11].

These articles are all in line with showing that inadequate nutritional intake, influenced by various factors such as education, income, and working conditions, significantly impacts women's menstrual health in agricultural areas. All articles show that poor nutritional status, either due to inadequate nutritional intake or unfavorable environmental conditions, can lead to various menstrual disorders such as amenorrhoea, menstrual pain, and anemia. Research by Ibrahim (2023) and research by Chandra (2019) provide additional insights into economic factors and health awareness affecting nutrition access among farmers, while research by Yaşar (2019) adds a work environment perspective[10,13,14]. The overall findings are consistent and mutually supportive, suggesting a close relationship between nutrient intake and menstrual health among women in agricultural areas.

CONCLUSION

Based on the results of the review of these studies, it is highlighted that lack of nutritional intake can increase the risk or even directly cause menstrual disorders in women from agricultural areas. Unbalanced diets, often due to low food consumption patterns and poor economic conditions, disrupt hormone regulation essential for a healthy menstrual cycle, leading to disorders such as amenorrhea. Additionally, the stressful working environments in agriculture further contribute to these issues. Limited awareness about balanced diets among women farmers exacerbates reproductive health problems, including menstrual pain and anemia. Specifically, inadequate iron intake is linked to anemia, directly impacting menstrual health. It is crucial to implement nutrition interventions, enhance diet education, and improve working conditions to improve women's reproductive health in agricultural areas. These measures will enhance their overall well-being, productivity, and quality of life.

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