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Literature Review

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Literature Review on Human Metapneumovirus: Updates, Trends and Emerging Concerns in Indonesia, Southeast Asia

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ABSTRACT

Introduction Human Metapneumovirus (HMPV), is an RNA virus contributing to the pathogenesis and severity of Acute Respiratory Infection (ARI) in vulnerable populations globally. Despite recent reports of increasing HMPV cases in China, research on HMPV in Indonesia remains scarce compared to studies conducted in other Southeast Asian countries.
Content: HMPV as a pathogen is accidentally discovered in concurrent with the study of other causative agents. HMPV infection can cause severe respiratory tract infection, especially in vulnerable populations such as the elderly and children with underlying disease. Therefore, research in respect to HMPV epidemiology, morbidity and mortality of the disease generated by HMPV infection in Indonesia should be continuously conducted.
Conclusion: This study aims to review findings of HMPV in Southeast Asia region countries such as, Malaysia and Singapore. Understanding HMPV seasonality patterns, clinical features, surveillance and public health responses could improve readiness for the upcoming emergence.

Keywords: Human meta pneumovirus; acute respiratory infection; children

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Introduction

In early January 2025, there was information about the escalation of HMPV infection in China and globally. The Indonesian Ministry of Health also issued a statement regarding the rise in infection, urging the public to actively follow the hygiene protocol as a preventive measure[1]. A previous unpleasant experience of COVID 19 pandemic has led the public to feel distress of the new emerging HMPV infection. In addition, the preliminary information stated that HMPV infection could lead to severe lower respiratory infection and act as a life-threatening infection. Circulating reports are also misleading due to limited data regarding HMPV infection in Indonesia.

HMPV was first detected in the Netherlands in 2001 and infected children in the early years. The symptoms are various from as light as flu-like symptoms to a life-threatening symptoms[2]. HMPV is discovered as the common causative agent of respiratory infection alongside with the more common pathogens such as seasonal influenza, respiratory syncytial virus (RSV) and the less common, mycoplasma pneumonia[3]. Another study stated that lower respiratory infection is accounted for global burden of disease [4], emphasizing the need to further investigate and if applicable, produce a vaccine to prevent the transmission and disease progression. Compared to other Southeast Asia members such as Malaysia, Thailand, and Singapore, studies focusing on HMPV in Indonesia are insufficient.

Epidemiological Trends

Global and Regional Context

In late 2024 and early 2025, an upward trend in HMPV infections was observed across multiple regions, with China experiencing a significant spike, however, this surge is within the expected range during the winter seasonality pattern. No reported overwhelmed hospital occupancy rate during these upward trends [3]. This increase led to intensified surveillance efforts and strengthened public health preparedness measures throughout Asia, including Indonesia[5,6,7].

Indonesia

By early 2025, Indonesia had not observed a notable surge in HMPV cases; however, proactive measures were undertaken, including strengthened surveillance at ports of entry and monitoring of international travelers exhibiting influenza-like illness (ILI) symptoms[5]. Indonesia's Ministry of Health acknowledged the detection of HMPV cases within the country, clarifying that the virus is not novel and generally presents with symptoms similar to those of the common flu. The majority of identified cases were among children, with no indications of significant severity or associated mortality[8].

HMPV as a causative agent in Indonesia, was discovered concurrently with findings on ARI pathogenes. The research conducted by *Virology Laboratory of the Center for Biomedical Research and Development and Basic Health Technology*, in Deli Serdang Hospital, Wonosari Hospital, and Kanudjoso Djati Hospital during August-September 2016 stated that among the positive findings, HMPV was found to be the highest number of virus findings. Although the study was conducted outside the peak season for ARI, which typically occurs during the rainy season from October to March, and involved only 30 samples, the findings remain noteworthy and warrant further attention[910].

The study is similar to the finding in RS Moewardi Solo. HMPV was found to be the second highest virus cause after influenza H3 in 32 sample patients visited RS Moewardi Solo during May – June 2010[11]. Another study conducted in Tabanan, Bali, which included patients ranging in age from 8 months to 80 years, also identified HMPV as one of the causative agents of ARI[12]. A study to investigate viruses generating ARI held in Bandung, West Java in 2010, showed that viral pathogens to cause ARI from PCR were HRV, RSV A, HMPV and RSV B[13]. Another study measuring the causative agents of 188 hospitalized children in several cities in Indonesia (Semarang, Yogyakarta, Tangerang) causing Pneumonia (Community Acquired Pneumonia) in children 2-59 months. Pneumonia is caused by mostly bacteria, but several results show mixed causative agents, and HMPV was one of the causative agent[14].

The findings imply that available studies suggest that HMPV infection is not a recent occurrence in Indonesia. HMPV has been identified as a causative pathogen alongside other major etiologies of ARI. However, research specifically focusing on HMPV, including its epidemiology, clinical characteristics, and public health response remains limited. The research gap on HMPV in Indonesia primarily stems from limited molecular diagnostic and surveillance capabilities and the low national research priority given to this virus.

Other Southeast Asian Countries

In Malaysia, a chaotic situation during HMPV emergence in this early year was also recorded, public health measures have been widely informed due to the awful experience of COVID-19 pandemic [6]. Compared to Indonesia, Malaysia has been focusing on HMPV research. A molecular epidemiology study conducted by Yew et al. found that among the 4 major causeS of ARI HMPV, was one of the causative agents [15]. One epidemiology study, HMPV was found children below 4 years during one year in 2012, the study concluded that the younger the age, the more susceptible to be infected by HMPV. The study also found that the number of cases were higher in November and December 2012, presumably because of Monson period. Fifty-three cases were identified in children under 4 years of age, indicating a high incidence in this age group [16]. A study conducted in Malaysia by Bhassu from February 2010 to March 2012, showed that HMPV infection symptoms are fever, cough, rhinorhoea, wheezing, sore throat,

lethargy and shortness of breath[17]. A further study focusing on phylogenetic analysis has also been conducted by Chow et al in 2016 ([18], resulting in mapping of HMPV sublineage which causes ARI in Malaysia during 2014-2015 and started to observe the possible pandemic risk of HMPV.

A 2011 study in Thailand, paralleling research from Malaysia, explored the molecular prevalence of HMPV in samples that were Influenza A negative[19]. One study discovered that HMPV accounted for 9% of ARI causative agent, after COVID pandemics [20].

Recent studies on HMPV in Singapore indicate an increasing prevalence in recent years. Given its potential to cause severe illness, these findings underscore the importance osustained surveillance and strengthened public health preparedness [7]. HMPV cases peaked in 2018 and subsequently declined during the COVID-19 pandemic. Nonetheless, a marked uptick was recorded again in late 2024 [21]. Due to its mutational dynamics and rising resistance to neutralizing antibodies, HMPV can undermine immune protection and increase the risk of reinfection in previously exposed individuals [22].

Result

Symptoms and Severity

HMPV is commonly associated with respiratory tract infections that vary in severity, from mild symptoms resembling the common cold—such as cough, nasal congestion, fever, and sore throat—to more serious illnesses including bronchitis, pneumonia, and acute respiratory distress syndrome (ARDS). These severe outcomes are predominantly observed in high-risk populations, including young children, the elderly, and individuals with compromised immune systems [1724]. Although the majority of infections are mild and resolve without medical intervention, severe disease can still occur, particularly among vulnerable groups[25].

Genotypes and Seasonality

HMPV is divided into two principal subgroups, A and B, each encompassing multiple genetic clades. These subtypes commonly co-circulate, although seasonal dominance by one subgroup is occasionally observed[723]. In subtropical regions, including Southeast Asia, HMPV outbreaks are more frequently reported during the winter months [16].

Surveillance and Public Health Response

Indonesian's Response

Following the increase in HMPV cases reported in China, the Indonesian government has intensified surveillance measures and issued public health guidance promoting hygiene and remaining calm during

the rise of HMPV cases[8]. Authorities have also implemented screening protocols at entry points and coordinated with international health agencies to track the virus's progression[5].

Regional Preparedness

Studies in Malaysia, Thailand, Singapore emphasize the epidemiology, clinical features, public health responses to emergence. The governments have enhanced monitoring systems for respiratory viruses and conducted preparedness exercises to ensure swift and effective responses to potential surges in HMPV or other respiratory infections [6,7].

Conclusion

HMPV, since its first recognition in the Netherlands as pathogens causing ARI infection in children, a wide range of HMPV research across the globe has risen alongside the rising trends of HMPV globally. Research activity on HMPV has been increasing across the Southeast Asia Region.

However, in Indonesia, even though HMPV can lead to prolonged infection and immune-mediated tissue damage contributing to acute lower respiratory tract infections in immunocompromised individuals, the role of HMPV as a causative agent remains largely underrecognized. Given the increasing transmission trends and its capacity to impair immune function, strengthening surveillance systems is essential, particularly in resource-limited settings such as Indonesia. Integrating HMPV surveillance into the national ARI system would be a valuable initial step to monitor HMPV trends. Looking ahead, the development of vaccines should be prioritized, drawing lessons from previous pandemics like COVID-19 and Ebola[7].

In the future, research in the significance of studying HMPV in Indonesia, highlighting the epidemiological context, impact on health systems and hospitalization rates, is also a crucial aspect. Whether HMPV could lead to greater problems similar to COVID-19 remains unclear and needs further investigation and research.

Conflicts of Interest

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Helicopter Parenting: Effects on Medical Students' Adaptation and Academic Achievement

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ABSTRACT

Introduction: Helicopter parenting has many negative impacts on higher education, including how it affects students' college adjustment and academic achievement. Although a wide range of articles explore helicopter parenting and its influence on higher education, the research on medical education still scarce.
Methods: The aims of this study provide a brief explanation of helicopter parenting and its impact on medical education. Articles were collected by assessing SpringerLink, ScienceDirect, Taylor & Francis, and Google Scholar databases.
Result: Overcontrol and overprotective manners from helicopter parents may reduce children's sense of autonomy and competence. Hence, it significantly reduces students' self-efficacy, self-directed learning, and has low intrinsic motivation in learning. The children of helicopter parents are vulnerable to stress, anxiety, and depression, and tend to have difficulties adjusting to college life.
Conclusion: Considering the negative impacts of helicopter parenting, faculty and medical teachers need to develop strategies to address the issue and prevent further impacts.

Keywords: Helicopter parenting; medical; education

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Introduction

The role of parents in higher education is much needed, not only in providing financial support for their children.[1] Parents also have a significant impact on students' college adjustment and academic achievement.[2–4] Parenting style is a key factor in the development of children's cognitive, social, and emotional abilities, which influences the development of autonomy and independence during the transitional phase.[4] Students in higher education are generally in this transitional phase between adolescence and adulthood, also known as emerging adulthood, typically spanning the age range of 18 to 25 years.[5] Although children's autonomy and independence have increasingly developed during this transitional phase, parents still have an important role in the development process and in maintaining children's well-being.[4]

Parenting style with excessive parental involvement and control is often referred to as helicopter parenting.[4,6] Helicopter parents tend to overprotect their children, have high expectations of their children's education, but treat them as if they are incapable of solving their problems.[7,8] Children raised with helicopter parenting are usually lacking in independence and confidence in their abilities. They also tend to have difficulties in self-regulation, controlling their emotions, decision-making, and determining life goals.[4,9] Helicopter parenting significantly increases children's vulnerability to stressors, anxiety, and depression, thereby increasing alcohol and drug use.[10] Furthermore, the children may have an increased risk of school burnout, college maladaptation, and failing in academic achievement.[8,9,11,12]

Despite extensive research on helicopter parenting and its psychological and academic consequences, there remains a significant gap in understanding its specific impact within the context of medical education. Medical students face unique academic pressures, emotional demands, and professional expectations that distinguish them from students in other disciplines. The rigorous and high-stakes nature of medical training requires not only cognitive competence but also emotional resilience, autonomy, and self-regulation—traits that are often undermined by helicopter parenting.[13]

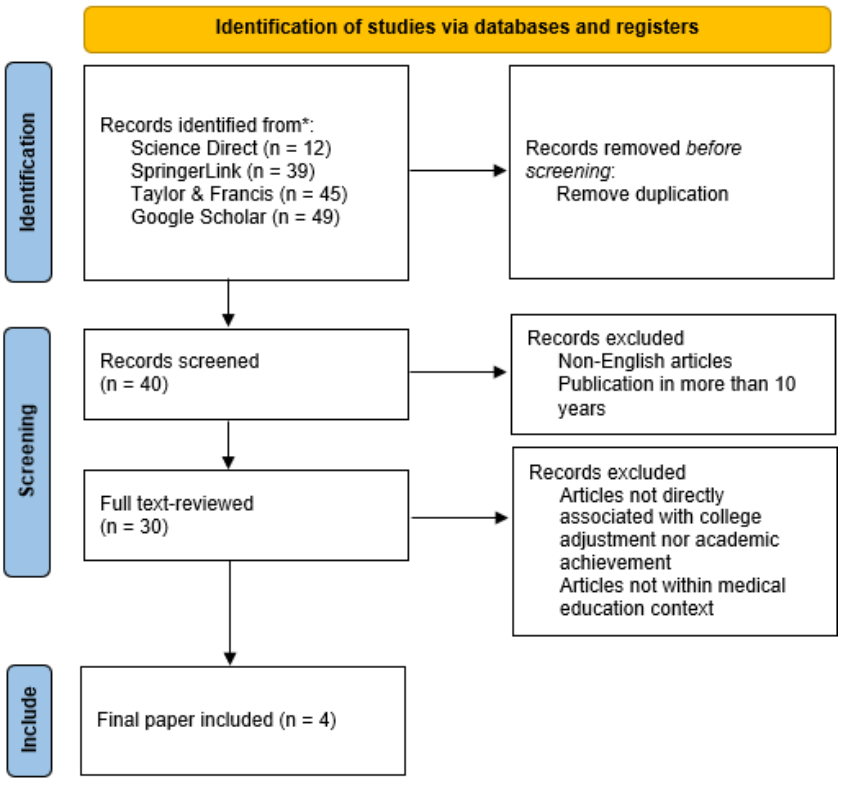
Medical education emphasizes the development of clinical judgment, ethical decision-making, and independent problem-solving, all of which are foundational to professional competence. However, students raised with excessive parental control may struggle with these competencies due to limited exposure to autonomous decision-making and self-directed learning.[2] This can result in poor adaptation to the demands of medical school, increased psychological distress, and reduced academic performance. Moreover, the culture of excellence and competitiveness in medical education can exacerbate the vulnerabilities associated with helicopter parenting, such as perfectionism, fear of failure, and dependence on external validation.[14] These factors may contribute to higher rates of burnout, anxiety, and academic disengagement among medical students, ultimately affecting their professional development and patient

care outcomes.[9,15]

Given the critical importance of fostering independence and emotional maturity in future healthcare professionals, it is essential to explore how helicopter parenting influences college adjustment and academic achievement specifically in medical education. Understanding this dynamic can inform targeted interventions, student support strategies, and parental guidance frameworks that promote healthier developmental trajectories for medical students.

Methods

This is a literature study on helicopter parenting in medical education and how it impacts students' college adjustment and academic achievement. Literature exploration is done by accessing the SpringerLink, ScienceDirect, Taylor & Francis, and Google Scholar databases. Literature search was conducted from January 5 to March 20, 2025, using the keywords of "helicopter parenting", "parenting style", "college adjustment", "academic achievement", as well as the combination of these four keywords with "higher education", "medical education" and "medical students". Based on the literature search, 27 articles related to helicopter parenting and parenting style in the context of medical education and their correlation to college adjustment and academic achievement were obtained. The systematic step in identifying relevant articles is described in Figure1 (PRISMA flow diagram).[16]



Result

A total of 4 studies met the inclusion criteria and were included in this review (Table 1).[2,17–19] The studies were selected based on their focus on helicopter parenting and its impact on college adjustments and academic achievement in medical students. After screening duplicates, title and abstract reviews and full-text evaluations, 4 articles were included in the final synthesis.

Table 1. Included studies

No	Author (year)	Title	Key findings
1.	Lee JY, Park IB, Yune SJ, Park KH. (2024)	Structural relationships between psychological factors and college adjustment among medical students in South Korea: focusing on helicopter parenting and respectful parenting.	Helicopter parenting plays as a mediator in affecting mindset, grit, and self-directedness, which negatively impact college adjustment
2.	Qamar T, Majeed S. (2020)	Parenting Styles, Self-efficacy, Emotional Intelligence, and Academic Achievement in Medical Students	Positive parenting styles foster emotional stability and confidence, which are crucial for success in demanding academic environments
3.	Huang L, Wang Z, Yao Y, Shan C, Wang H, Zhu M, et al. (2015)	Exploring the association between parental rearing styles and medical students' critical thinking disposition in China	Positive rearing styles, especially those high in emotional support and autonomy encouragement, significantly influence critical thinking
4.	Suliman S, Allen M, Chivese T, de Rijk AE, Koopmans R, Könings KD. (2024)	Is medical training solely to blame? Generational influences on the mental health of our medical trainees	No significant relationship between parenting style and mental health outcomes among medical trainees

Discussion

Helicopter Parenting and Its Impact on Education

Helicopter parenting is a term to describe a parenting style characterized by overprotection and control.[10] Helicopter parents may hover over their children, ready to rescue their children from disappointment and painful experiences. By doing so, they are sending a message to their children that they are incapable of doing their chores, overcoming their problems, and require constant protection from

their parents.[7] Helicopter parents are usually high in warmth and support, but also high in control and low on granting autonomy to the child. Hence, they can reduce their children's sense of autonomy and competence.[20] The self-determination theory posits that an individual must fulfill three basic needs to promote health and well-being: (1) the need for autonomy, which involves feeling free to make one's own choices, (2) the need for competence, or a feeling of confidence in one's own abilities, and (3) the need for relatedness, which involves feeling that one is part of a genuinely caring relationship.[21]

Many studies indicate that overparenting reduces children's self-efficacy, a measure of children's sense of competence, which supports self-determination theory.[4,22,23] Self-efficacy is needed for the self-regulated learning perspective, which addresses the belief one has in one's ability to regulate academic achievement through thoughts, motivation, affect, and actions. Children with low levels of self-efficacy might struggle with social and academic adjustment to college and have lower GPAs.[4,23]

In education, helicopter parenting may reduce children's intrinsic motivation to learn. Children growth by helicopter parenting often prioritize extrinsic motivators, such as gaining parental approval or achieving high grades. Children must have good grades and be academically successful to be loved and accepted.[24] They sometimes develop maladaptive perfectionism, which they feel as though they are unable to achieve the standards that have been set for them.[(11,12,24)] Helicopter parents have been associated with an increased sense of entitlement, which might reduce academic performance by reducing children's intrinsic motivation to learn.[24]

Children who receive constant protection and help from helicopter parents may feel less competent and more vulnerable to stressors. They have difficulties in the development of coping mechanisms, leading children to feel that they lack control over their lives, which results in a lack of volition.[4,25] The inability to meet the daily demands of higher education might result in children's school burnout.[(9]

Many studies addressing helicopter parenting in Indonesia showed that in higher education, helicopter parenting reduces students' self-confidence and increases vulnerability to stressors and anxiety.[26,27]Children of helicopter parents often have difficulty determining their own career goals and personal interest..28 Helicopter parenting significantly increases the possibility of the child having neuroticism traits, which makes children susceptible to stress, anxiety, and other negative emotions.[29]

Helicopter Parenting in Medical Education

Medical students experience unique stressors during their education journey, and the role of parenting has been examined specifically in this context. However, there are limited studies addressing helicopter parenting in the context of medical education. Parenting styles have a positive association with self-efficacy and emotional intelligence, which were significant predictors of medical students' academic

achievement.[17] Children with high-control parents usually show low self-confidence and have difficulties in solving their problems due to their dependency on their parents.[2,18] High-control parents negatively impact medical students' critical thinking disposition, educational success, and career paths.[18,30]

A study in South Korea showed that helicopter parenting hinders medical students' autonomy and independence and negatively impacts their mindset and college adjustment.[2] Mindset is a term to describe one's beliefs about their intellectual abilities in a given situation. Learners with a growth mindset are more adaptive in their goal standards and orientation, learning strategies, task difficulty preferences, and responses to criticism. They believe their abilities can be improved, fostering grit and maintaining passion and perseverance in pursuing long-term goals.[2,31,32] Furthermore, the growth mindset and grit will reinforce self-directed learning attitudes, which can be a key factor in a medical student's college adjustment. Learners with high self-directed learning show better academic performance and may lead a successful college life.[2]

Contrary to the other studies, a study in Qatar showed that parenting styles do not affect the mental health of medical students. This might be associated with the collectivist cultures, in which parents are regarded as authorities in the family and are responsible for their children's success, even in adulthood.[19]

Considering the impacts of helicopter parenting on students' college adjustment and academic achievement, it's important to overcome the problems and prevent further negative impacts. However, the studies exploring student support related to helicopter parenting are still limited. Currently, student support focuses more on the effort to provide a smooth student transition and adaptation to college life.[33,34] Involving parents in the student support program has positive impacts on academic achievement.[35] Parental involvement in higher education has three dimensions, which are parental support giving, parent-student contact and communication, and parental academic engagement.[36] To optimize parental engagement for academic success, academic socialization plays a key role in developing the kind of student support.[35] Within the medical education context, faculty are expected to be able to recognize student needs, both in fulfilling academic and clinical competencies, as well as developing individual students through optimizing the role of teaching staff, educational institution systems and management, and peers.[37,38]

Conclusion

Helicopter parenting, characterized by high control and low autonomy-granting, can significantly hinder a child's educational development, particularly in higher education settings. While these parents often intend to provide support and protection, their overinvolvement tends to undermine a child's autonomy, competence, and self-efficacy—core components of self-determination theory. This parenting style has been linked to reduced intrinsic motivation, increased anxiety, maladaptive perfectionism, and

academic burnout, especially during the transition to college life.

In medical education, where students face high academic and emotional demands, helicopter parenting further impairs the development of independence, critical thinking, and self-directed learning, skills essential for long-term success. Although cultural differences may moderate these effects, the overall evidence suggests that excessive parental control compromises students' ability to cope, adapt, and thrive in challenging academic environments.

Minimizing the negative effects, it is crucial to enhance student support systems by incorporating suitable parental involvement and promoting healthier parenting styles that balance support with autonomy. Empowering faculty to address students' individual needs and promoting academic socialization can also help medical students develop resilience, self-efficacy, and a growth mindset essential for success in both education and future professional life.

Conflicts of Interest

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Case Report Open Access

Pulmonary Metastasis in Breast Carcinoma: Role of Imaging in Addressing Cases of Delayed Diagnosis

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ABSTRACT

Background: Breast cancer is still the second leading cause of death, with most deaths caused by breast cancer being due to complications associated with metastasis. The target organ of metastasis that often occurs in breast cancer is the lung. Imaging modalities are essential to see breast cancer with lung metastasis and determine early intervention.
Objective: Report on the case of a 60-year-old female patient with lung metastasis of breast carcinoma at Bethesda Hospital, Yogyakarta.
Case Description: A 60-year-old female patient presented with complaints of shortness of breath on exertion and weight loss. The radiological finding was consistent a lung metastatic lesion.
Conclusion: Timely identification of breast cancers and lung metastases is essential for successful treatment and a favorable prognosis, as individuals with smaller tumors at diagnosis exhibit significantly reduced mortality risk and enhanced survival rates. Imaging using ultrasound-assisted mammography can be the primary modality for diagnosing, and screening of breast tumors, while for the detection of lung metastases, plain chest X-ray can be used as the primary modality for diagnosis and CT can be a supporting imaging method for the presence of smaller metastatic nodules.

Keywords: Breast Carcinoma; lung metastasis; radiological findings

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Introduction

Breast cancer is the most often diagnosed malignancy among women globally and ranks as the second greatest cause of cancer-related mortality, with metastasis responsible for the majority of deaths. The lungs are a prevalent metastatic location, affected in about 50% of individuals with advanced breast cancer.[1,2] Prompt identification and precise diagnosis of pulmonary metastases are essential for prompt intervention and enhanced prognosis. Nonetheless, delayed diagnosis continues to pose a considerable difficulty, frequently attributed to asymptomatic early stages or sharing clinical characteristics with benign illnesses.[3,4] The prognosis for breast cancer patients with lung metastases remains unfavorable, notwithstanding chemotherapy and hormonal treatment guided by molecular receptor profiling.[5] This case report aims to delineate the diagnostic process and treatment strategy for a 60-year-old female patient with breast cancer who acquired pulmonary metastases, emphasizing the significance of imaging techniques in mitigating diagnostic delays. Mammography and ultrasound are essential instruments for breast cancer screening, nonetheless, their inadequate usage in this instance resulted in a postponement of the main tumor's diagnosis. Subsequent radiological assessments, including chest X-rays and CT scans, were crucial in detecting lung metastases, nevertheless, limitations in sensitivity resulted in the first overlooked results. This case study aims to highlight techniques for enhancing early diagnosis and optimizing management protocols in analogous clinical situations.

Case

A 60-year-old female patient presented to the pulmonary outpatient clinic with a three-week history of fever, a congested nose, and a cough with white-colored sputum. The patient had a history of diabetes mellitus within the past two years. Thorax AP X-ray showed inhomogeneous opacity in bilateral haemithorax with increased perihilar and paracardial bronchovascular pattern, air bronchogram, CTR <0.5%, undeviated trachea, and left breast enlargement asymmetrical with right (Figure 1). 3 years later, the patient came back to the emergency room with complaints of shortness of breath from 1 month ago after every mild activity. In the last 6 months, the patient felt a drastic weight loss. On physical examination, there was cardiomegaly with edema in the extremities, a solitary mass in the left lower neck, and decreased vesicular sound in the left lung. An AP Thorax X-ray was performed which showed an increase in perihilum bronchovascular pattern, parenchymal lung collapse, fluid level in the left pleural cavum, parenchymal reaction, and multiple opaq nodules with clear borders on the left and right parenchyma suggestive of Bronchogenic Ca with partial left lung collapse, massive pleural effusion and bilateral satellite nodules (Figure 2). Fine needle aspiration examination showed lung adenocarcinoma and histopathological pleural biopsy showed clustered inflammatory cells consisting of lymphocytes,

leucocytes with erythrocyte background. At that time, the patient was diagnosed with EGFR-positive metastatic lung adenocarcinoma with left pleural effusion. 2 weeks later, the patient came back with complaints of coughing, shortness of breath, and weakness. Thorax CT scan showed a mass filling the inferior and superior lobes of the left lung with well-defined borders and smooth edges and narrowing of the left main bronchus, with intact bone system, leftward deviation of the sternum, multiple satellite nodules on the right haemithorax, with rightward deviation of the trachea (Figures 3 and 4). 7 months later, an AP Thorax X-ray examination showed that there was improved bronchovascular pattern, reduced air bronchogram, reduced left pleural effusion, but meniscus sign, metastatic nodules and satellite nodules were no longer prominent, leading to signs of improvement, with complaints of shortness of breath (Figure 5). The patient was diagnosed with left mammary carcinoma with lung metastatic adenocarcinoma.

Figure 1. First AP Thorax X-ray

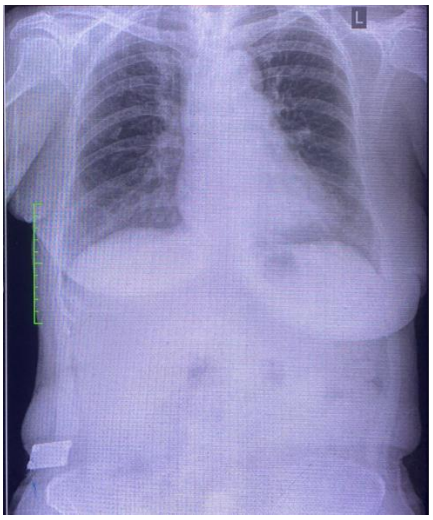


Figure 2: Thorax X-ray of AP 3 years later.

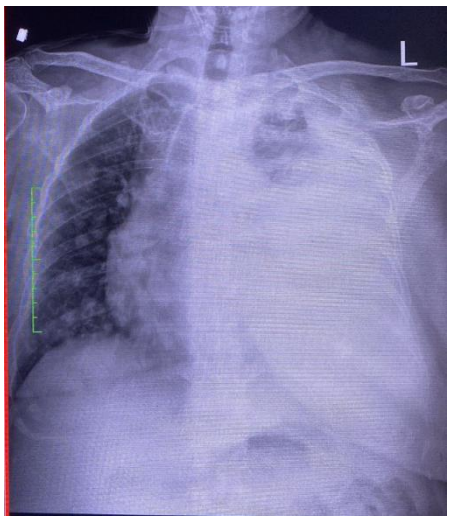
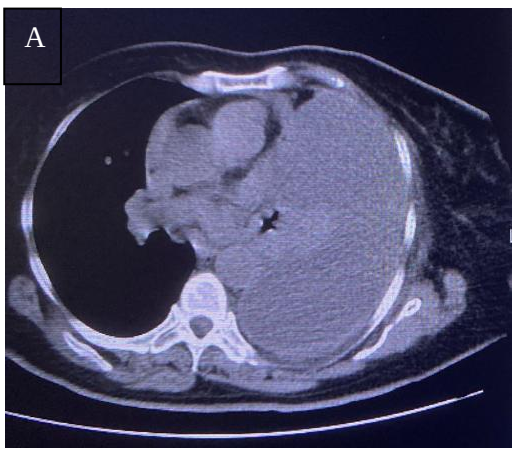


Figure 3. Axial CT-Scan of Mediastinal Window (A) and Lung Window (B) of Thorax 2 Weeks Later



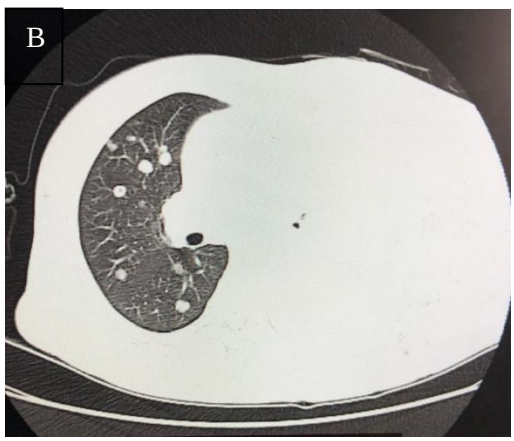


Figure 4. Coronal CT-Scan (Lung Window) of Thorax 2 Weeks Later

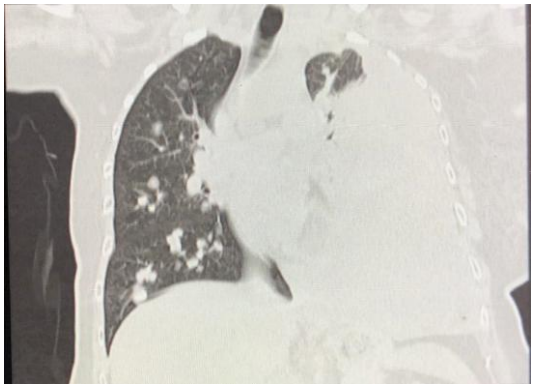
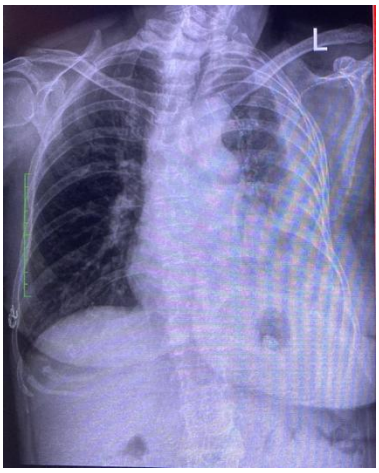


Figure 5: Thorax X-ray of AP 7 months after the last control.



Discussion

This case report presents a 60-year-old female patient who experienced a significant delay in the diagnosis of breast carcinoma, which subsequently progressed to pulmonary metastases, underscoring various critical challenges in the field of oncology diagnostics and management.[1,5] The patient presented with non-specific respiratory symptoms, including dyspnea and unexplained weight loss, which were later identified as associated with advanced metastatic disease. Radiological assessments, including sequential chest X-rays and CT imaging, revealed notable findings suggestive of metastatic lung involvement, characterized by pleural effusion and numerous parenchymal nodules.[6] Nevertheless, the diagnostic process faced obstacles stemming from the absence of early breast imaging studies, particularly mammography (Figures 6-7) and ultrasound (Figure 8), which could have facilitated the earlier detection of the primary breast malignancy.[7–9] The diagnostic complexity heightened as histological examination of biopsy specimens revealed the presence of EGFR-positive lung adenocarcinoma, resulting in initial ambiguity concerning whether this signified a primary pulmonary malignancy or metastatic breast carcinoma, a well-documented diagnostic challenge in the literature.[5] The diagnostic complexity was heightened by the patient's comorbidities, including diabetes mellitus, in conjunction with the atypical evolution of radiological findings observed during her illness.

Figures 6 and 7. Mammogram examination of breast cancer lesions

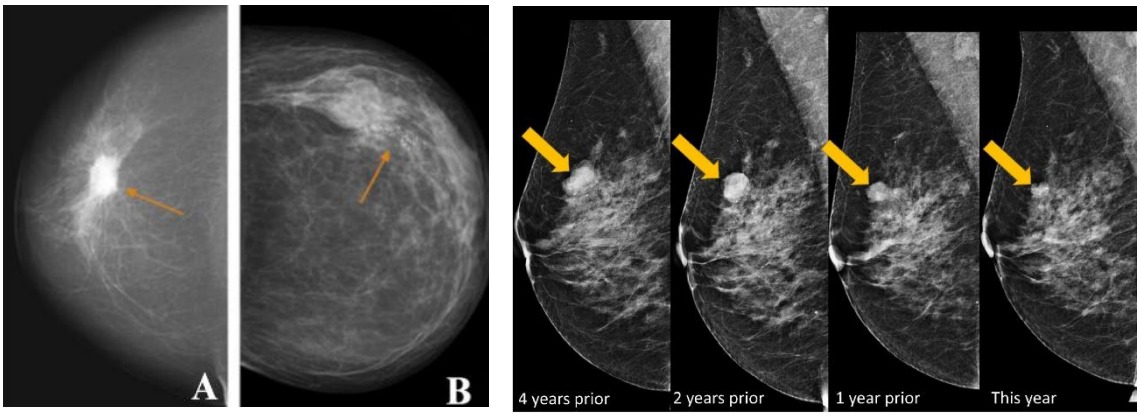
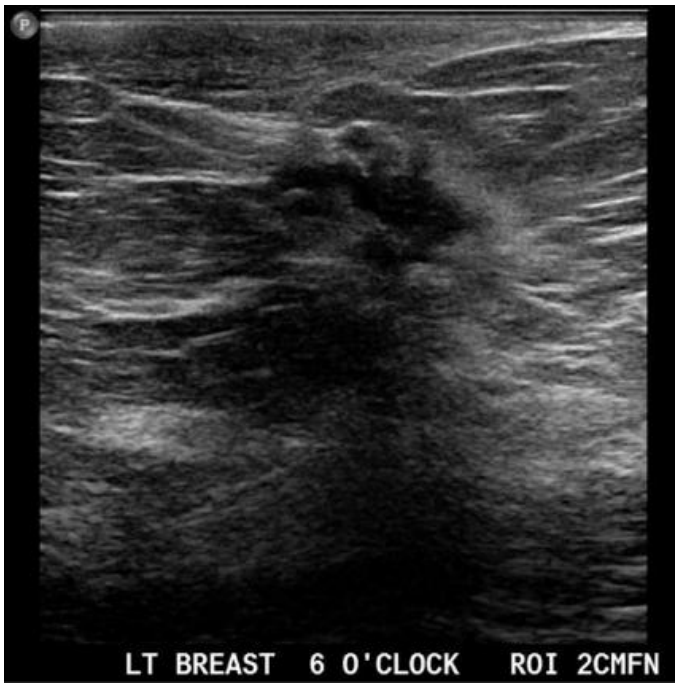


Figure 8. Ultrasound imaging technique of breast cancer lesions



The imaging findings in this case underscore the strengths and constraints of contemporary diagnostic techniques in identifying metastatic disease. Standard chest radiography (Figures 9-10), although easily accessible and economical, exhibited restricted sensitivity for smaller metastatic lesions, especially those measuring less than 1 cm in diameter, following the existing literature on the topic.[6] Enhanced imaging through CT scanning (Figure 12) has facilitated better detection of pulmonary nodules, including smaller metastases; however, it still does not identify certain lesions, especially those situated near the hilar region where vascular structures may obscure small nodules.[10,11] The limitations of imaging highlight the necessity of utilizing a multimodal imaging strategy in these instances, as the integration of various

techniques may yield supplementary insights. This case highlights the potential utility of breast MRI in analogous clinical situations, especially considering its elevated sensitivity for identifying breast malignancies, even among patients with dense breast tissue where mammography may demonstrate reduced efficacy.[12,13]

Figures 9 and 10. Lung metastasis features on plain thorax photograph

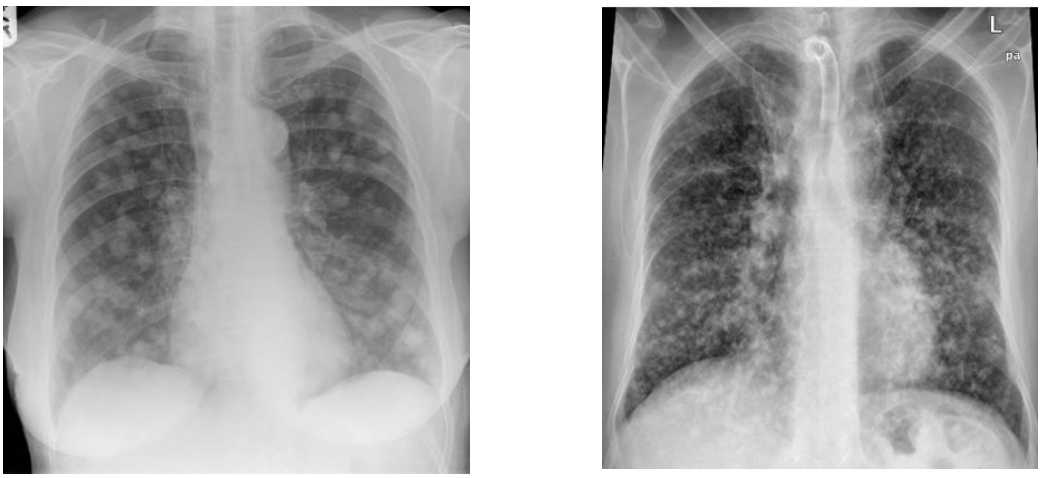


Figure 11. Findings of missed lung metastatic lesions (A), and newly discovered 4 months after the initial photograph (B).

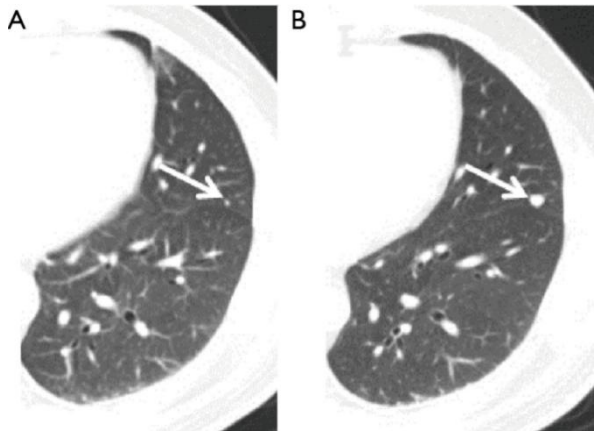
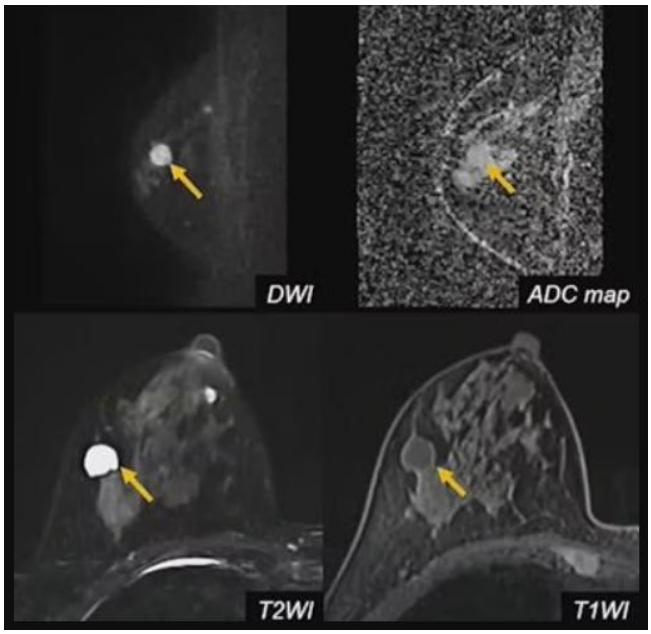


Figure 12. MRI imaging technique of breast cancer lesions



The delayed diagnosis in this case can be attributed to several systemic factors, particularly the absence of initial breast imaging in a patient who was later confirmed to have metastatic breast carcinoma.[7,12] This oversight illustrates a prevalent difficulty in clinical practice, wherein symptoms may initially seem to arise from a specific organ system, while in reality, they may signify metastatic disease originating from an entirely different primary site. The case underscores challenges in care coordination, as the management of the patient required the involvement of various specialties, including pulmonology, radiology, and oncology, without a clear integration of these services at the initial stages of the diagnostic process. The findings are consistent with the current body of literature that illustrates the role of fragmented healthcare systems in causing diagnostic delays among cancer patients, especially in cases such as breast cancer, where early detection plays a crucial role in influencing prognosis.[1,5]

The clinical ramifications of this case reach beyond the singular patient, prompting broader reflections within the field of oncology practice. Initially, it underscores the necessity of sustaining a heightened level of suspicion for metastatic disease in patients who exhibit unexplained pulmonary findings, especially in the presence of malignancy risk factors.[1,5] Furthermore, it highlights the essential requirement for a thorough initial assessment that takes into account possible primary locations beyond the organ system that is currently exhibiting symptoms.[7] Third, it demonstrates the importance of a coordinated, multidisciplinary approach to cancer diagnosis and management, wherein contributions from diverse specialties can be integrated from the initial stages of patient evaluation.[8] The insights gained from these lessons hold substantial importance in the realm of metastatic breast cancer, as early detection and intervention can profoundly influence the course of the disease and the outcomes for patients.[1,8]

This case offers significant insights into the performance characteristics of different imaging modalities for the detection of pulmonary metastases from a technical standpoint. In general, the examinations that are frequently used are ultrasound, mammography, and magnetic resonance imaging (MRI).[14] The radiographic changes observed in the series of images illustrate the advancement of metastatic disease and the differing sensitivity of various imaging modalities at distinct stages of the condition.[6] The analysis of earlier and later imaging studies distinctly underscores the evolution of metastatic lesions in radiographic presentations over time. It is noteworthy that certain lesions, which may appear inconspicuous in initial assessments, can become increasingly evident as they progress or as imaging methodologies improve.[10,11] The findings presented here hold significant relevance for the advancement and interpretation of imaging protocols in individuals suspected of having metastatic disease.

The diagnostic challenges observed in this case highlight potential avenues for technological progress in imaging methodologies. Current modalities such as digital mammography (Figures 6-7), high-resolution CT (Figures 11), and MRI (Figure 12) serve as effective instruments for cancer detection. However, there is still potential for enhancement in sensitivity for small lesions, especially in anatomically intricate regions like the lung hila.[10,11] Innovative technologies like digital breast tomosynthesis, PET-MRI fusion imaging, and sophisticated computational analysis of imaging data have the potential to mitigate certain limitations in forthcoming clinical applications.[9] Furthermore, this case highlights the increasing significance of molecular diagnostics in elucidating ambiguous situations, as demonstrated by the critical function of EGFR testing in the diagnostic evaluation of this patient.[5]

In summary, this instance of a postponed breast cancer diagnosis accompanied by pulmonary metastases exemplifies the intricate challenges associated with cancer diagnosis and staging. This analysis underscores the advantages and drawbacks of existing diagnostic techniques, illustrates the repercussions of disjointed care provision, and offers critical insights for enhancing the early identification of metastatic conditions.[1,5] The serial imaging studies presented in the case provide significant insights into the radiographic progression of metastatic lung disease and the comparative effectiveness of various imaging modalities.[6,10] In progressing from this case, the findings advocate for the development of more cohesive diagnostic protocols that merge clinical suspicion with suitable imaging techniques, the regular implementation of multimodal imaging strategies in patients identified as high-risk, and improved interdisciplinary collaboration to enhance outcomes for individuals with cancer.[10,13,15] It is essential to integrate these methodologies with continuous advancements in imaging technology and the creation of more sensitive and specific diagnostic instruments for the detection of metastatic disease.[9,11]

Conclusion

This case illustrates the potential for delayed diagnosis of breast cancer when pulmonary symptoms take precedence in the clinical presentation, potentially obscuring the signs of metastatic spread. The overlooked opportunities encompassed inadequate early breast imaging through mammography or ultrasound in the presence of respiratory complaints, an excessive dependence on basic chest X-rays that did not identify early metastases, and a lack of effective coordination among specialty teams that could have acknowledged the necessity for a thorough evaluation. The critical takeaway is that unexplained respiratory symptoms in high-risk patients necessitate a concurrent evaluation of thoracic and breast pathology through advanced imaging techniques, complemented by clinical correlation, as this comprehensive strategy may avert comparable diagnostic delays. Establishing uniform protocols for simultaneous imaging assessment and collaborative case analysis would enhance the early identification of conditions when therapeutic interventions are most beneficial, especially for aggressive malignancies with the potential for metastasis. Ongoing improvements in imaging sensitivity and the identification of specific tumor markers may significantly improve our capacity to detect these complex cases at earlier stages.

Conflicts of Interest

The authors declare that they have no competing interests.

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Original Article Open Access

Primary Dysmenorrhea and Sleep Quality: A Study in Tarumanagara University Medical Students

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ABSTRACT

Introduction: Primary dysmenorrhea is a common menstrual pain experienced by young women, characterized by lower abdominal quadrant pain without any underlying pelvic pathology. The intensity of menstrual pain can significantly impact daily activities, and it can also influence various factors, including sleep quality.
Objective: This study aimed to determine the association between sleep quality and dysmenorrhea severity.
Methods: This study used a cross-sectional design in 214 female medical students at Tarumanagara University aged between 18 to 25 years. Sleep Quality was measured using the Pittsburgh Sleep Quality Index (PSQI) and the severity of primary dysmenorrhea was measured using a questionnaire adapted from a previously developed instrument. It was validated and tested for reliability by the authors in this study (Cronbach's $\alpha = 0.767$). Data were analyze using the Chi-square and multivariable logistic regression, adjusting for BMI and age at menarche.
Result: The study found that 49.1% students have poor sleep quality, and 47.2% experienced severe primary dysmenorrhea. Poor sleep quality was significantly associated with higher dysmenorrhea severity (OR = 3.07; 95% CI: 1.76–5.37). Good sleep quality was independently associated with lower odds of severe dysmenorrhea (OR = 0.309; 95% CI: 0.174–0.548; $p < 0.001$), while BMI and menarche age were not significant.
Conclusion: Good sleep quality is independently associated with reduced severity of primary dysmenorrhea and may reduce the risk of experiencing severe dysmenorrhea.

Keywords: Dysmenorrhea; sleep quality; young adult: menstrual pain

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Introduction

The menstrual cycle in women usually lasts 28 days, with dysmenorrhea symptoms being a common symptom. Primary dysmenorrhea, not caused by any underlying medical conditions, often happens among students.[1,2] A study reported that 49% of medical school students experience primary dysmenorrhea, in 35.5% experience severe dysmenorrhea at Tarumanagara University.[3] In addition, a university in India has reported that 45% of its medical students experience primary dysmenorrhea.[4] Furthermore, Erciyes University Turkey determined that 82.4% had primary dysmenorrhea.[5]

Primary dysmenorrhea is mainly caused by excessive uterine contraction, and vasoconstriction leads to uterine ischemia (lack of blood flow) and pain. This can be mediated by the use of prostaglandin. Women with dysmenorrhea have higher levels of prostaglandins (PGF2α and PGE2) throughout menstruation when compared to those with asymptomatic. The pain is most severe in the first 48 hours of menses for dysmenorrhea.[6] Besides the pain, primary dysmenorrhea also consists of symptoms such as nausea, headaches, vomiting, diarrhea, dizziness, fatigue, irritability, and nervousness.[7]

Contributing risk factors to primary dysmenorrhea include family history, early menarche, lifestyle (such as smoking, caffeine intake, alcohol consumption, physical activity), stress, and poor sleep quality.[7] Poor sleep quality may aggravate dysmenorrhea symptoms by increasing proinflammation factors such as prostaglandin and cytokine along with increasing the pain sensitivity.[8] With these conditions, we need to research the relationship between sleep quality and the severity of primary dysmenorrhea among medical students from the class of 2021 to 2023.

Methods

This study used a cross-sectional design to determine the relationship between sleep quality and severity of primary dysmenorrhea among 214 medical students at Tarumanagara University. Participants were selected through consecutive sampling techniques with inclusion criteria, such as being aged 18 to 25 years old, menstruating for at least one year, non-smoker, never giving birth, never been diagnosed with any gynecological disease, agreed to be a respondent and signed an informed consent record.

Data were collected through a Google form, including Body mass index (BMI), age at menarche, sleep quality, and the severity of dysmenorrhea. The sleep quality was assessed using a Pittsburgh Sleep Quality Index (PSQI), and the severity of dysmenorrhea was assessed using a questionnaire adapted from a previously developed instrument. The questionnaire was tested through pilot testing on a small group of participants from the same population to assess clarity and usability. The reliability of the questionnaire was confirmed with Cronbach Alpha value of 0.767, indicating its suitability for use in this study. This study was conducted at the Faculty of Medicine, Tarumanagara, class of 2021 to 2023, in May 2025. All

participants have given their consent. This study was approved by the Ethics Committee of Tarumanagara University with approval number 312/KEPK/FK UNTAR/I/2024.

Data was analyzed with SPSS version 25, with descriptive statistics to summarize participant characteristics. Chi-square is used to analyze the correlation between sleep quality and the severity of dysmenorrhea, and the Odds ratio (OR) is calculated as the strength of the correlation. Multivariable binary logistic regression was performed to evaluate the independent association between sleep quality and dysmenorrhea severity. Nutritional status (BMI) and age at menarche were included as potential confounders. Adjusted odds ratios (AORs) and 95% confidence intervals were reported. A p-value < 0.05 was considered statistically significant.

Result

This study involved 214 medical students, 74.3% of whom were under 20 years old, while 25.7% were aged 20 or older. The Body Mass Index (BMI) of respondents was 46.7% normal, 23.8% obese, and 14% underweight. Most of the respondents have early menarche (54.7%), average menarche (36.9%), and late menarche (8.4%). The respondents reported that 52.8% experienced mild dysmenorrhea and 47.2% experienced severe dysmenorrhea. The respondents also reported that 50.9% have good sleep quality and 49.1% have poor sleep quality. Respondent characteristics are shown in Table 1.

Table 1 Characteristics of the respondents Faculty of Medicine at Tarumanagara University

Characteristics	N (%)	Mean ± SD	Median (Min - Max)
Age		20.29 ± 1.07	20 (18 - 23)
≥ 20 years	55 (25.7%)		
< 20 years	159 (74.3%)		
Body Mass Index		22.59 ± 4.14	21.72 (15.62 - 38.67)
Underweight	30 (14.0%)		
Average	100 (46.7%)		
Overweight	33 (15.4%)		
Obese	51 (23.8%)		
Menarche		12.44 ± 1.43	12 (8 - 17)
Early	117 (54.7%)		
Average	79 (36.9%)		
Late	18 (8.4%)		
Dysmenorrhea			
Mild	113 (52.8%)		
Severe	101 (47.2%)		
Sleep quality			
Good	109 (50.9%)		
Poor	105 (49.1%)		

Bivariate Analysis

Based on the Chi-square test ($p < 0.001$), there is a statistically significant correlation between sleep quality and the severity of primary dysmenorrhea. The majority of the respondents with poor sleep quality have been experiencing severe primary dysmenorrhea (60.6%), whereas the respondents with good sleep quality mostly reported mild dysmenorrhea (66.7%).

The crude Odds Ratio (OR) was calculated from the table:

$$OR = \frac{66 \times 70}{43 \times 35} = \frac{4620}{1505} \approx 3.07$$

The crude Odds Ratio (OR) was calculated as:

$$CI = e^{ln(OR) \pm 1.96 \times SE}, \text{ where } SE = \sqrt{\frac{1}{66} + \frac{1}{43} + \frac{1}{35} + \frac{1}{70}} \approx 0.285$$

$$CI = e^{1.124 \pm 1.96 \times 0.559} = e^{1.124 \pm 0.559} = (1.76, 5.37)$$

The Odds Ratio of 3.07 (95% CI: 1.76–5.37) indicates that the respondent with poor sleep quality was 3.07 times more likely to experience severe primary dysmenorrhea compared to those who have a good sleep quality. The result of this study confirms that poor sleep quality is related to increased severity of primary dysmenorrhea.

Table 2 Correlation between sleep quality and the severity of primary dysmenorrhea in medical students at Tarumanagara University

Sleep Quality	Category			*p-value*	*Odds Ratio (95%CI)*
	Mild	Severe	Total		
Good	70 (66.7%)	35 (33.3%)	105		3.07
Poor	43 (39.4%)	66 (60.6%)	109	<0.001	(1.76 – 5.37)
Total	113 (52.8%)	101 (47.2%)	214		

*Chi-square test

Multivariable Analysis

The result of the multivariable logistic regression analysis assessing factors associated with severe primary dysmenorrhea. After controlling for body mass index (BMI) and age at menarche, sleep quality remained significantly associated with dysmenorrhea severity.

Students who reported good sleep quality had significantly lower odds of experiencing severe dysmenorrhea compared to those who have poor sleep quality (OR = 0.309; 95% CI: 0.174–0.548; $p < 0.001$). This suggests that good sleep quality reduces the odds of severe dysmenorrhea by approximately 70% less likely to experience severe menstrual pain compared to those with poor sleep quality, independently of BMI and menarche age.

Other variables including, body mass index and age at menarche were not significantly associated with severe dysmenorrhea ($p > 0.05$). Although late menarche had a higher OR (2.109), the association did not reach statistical significance.

Table 3 Multivariable logistic regression analysis of factors associated with severe dysmenorrhea

Variable	Adjusted OR	95% CI	Sig.
Good sleep quality	0.309	0.174 – 0.548	<0.001
Overweight	1.006	0.434 – 2.332	0.988
Obese	1.335	0.649 – 2.746	0.432
Underweight	1.398	0.579 – 3.377	0.457
Early menarche	0.771	0.417 – 1.427	0.408
Late menarche	2.109	0.689 – 6.457	0.191

Reference category: Poor sleep quality

Discussion

50.9% of the respondents had good sleep quality, and 49.1% had poor sleep quality. A study by Adnan and Citrawati (2022) also found that 43 clinical clerkship students (41.3%) had poor sleep quality, and 61 clinical clerkship students (58.7%) had good sleep quality.[9] A study by Vidović et al. (2023) also reported a higher prevalence of poor sleep quality (67.9%) in 262 medical students in Croatia.[10] Medical students are highly vulnerable to sleep disturbances due to how they manage academic stress, study and rest time balance, and sleep hygiene. According to a study by Fitriyani et al. (2024), poor sleep quality may result from an activation of the hypothalamic-pituitary-adrenal (HPA) axis in response to excessive stress. This condition leads to elevated cortisol levels, heartbeats, and blood pressure, placing the body in a 'fight or flight' response that disrupts sleep. If this happens continuously, it may decrease sleep quality.[11]

In this study, 113 medical students (52.8%) experienced mild dysmenorrhea, and 101 medical students (47.2%) experienced severe dysmenorrhea. A recent national study by Situmorang et al. (2025) reported that 301 medical students (47.8%) experienced moderate to severe dysmenorrhea, 274 medical students (43.49%) experienced mild dysmenorrhea, and 55 medical students (8.73%) did not experience dysmenorrhea.[12] Another study by Sima et al. (2022) across five Romanian universities found that 507 students (37.6%) considered their menstrual pain to be severe, 778 students (57.7%) considered their menstrual pain to be moderate, and only 4.7% of students considered the menstrual pain to be mild.[13] All three studies further confirms that not only the prevalence but also the impact of dysmenorrhea on daily activity. Students reported that they have depleted energy levels, emotional stability, academic focus, and social interaction. Sima et al. recorded that 666 (49.4%) students had a negative effects on academic performance. Additionally, Situmorang et al. also found that there is an association between dysmenorrhea with depression and stress symptoms.[12,13] Likewise, this study observed that students are more prone to experience severe menstrual pain and often struggle with their daily tasks.

This study revealed a significant association between sleep quality and the severity of primary dysmenorrhea among medical students at Tarumanagara University. It shows that 49.1% of medical

students have poor sleep quality, and 47.2% of medical students experience severe primary dysmenorrhea. These findings justify the hypothesis that poor sleep quality is associated with severe menstrual pain, emphasizing the importance of sleep quality in reproductive health. Biologically, poor sleep quality may disrupt the hormone balance of estrogen and progesterone, and increase levels of prostaglandins and cortisol which may heighten uterine contractions and disrupt pain modulation in the brain. This study result is consistent with the meta-analysis by Liu et al. (2024) which reported that 70.3% prevalence of primary dysmenorrhea among college students and acknowledged having adequate sleep as a protective factor with an odds ratio (OR) of 0.328.[14] A study by Delistianti et al. (2019) at Islam Bandung University has found that 62% medical students had poor sleep quality, with the majority in that group experiencing moderate to severe primary dysmenorrhea. The statistics found in the study highlight the significant correlation between poor sleep quality and severe dysmenorrhea ($p = 0.04$).[15] Based on our study findings, college students with poor sleep quality are prone to experience severe primary dysmenorrhea.

In this study, multivariable logistic regression was performed to examine the independent association between sleep quality and dysmenorrhea severity, adjusting for Body Mass Index (BMI) and age at menarche. Sleep quality remained significantly associated with the severity of primary dysmenorrhea, whereas BMI and age at menarche were not significantly associated with the severity of primary dysmenorrhea. These results are aligned with a cross-sectional study among Jordanian women, which also reported no statistically significant association between severe dysmenorrhea and BMI or age at menarche, as well as other factors such as age and weekly study hours.[16] This similarity suggests that these biological characteristics may not have an independent effect on dysmenorrhea severity when other lifestyle and physiological variables are taken into account. In contrast, a study among Turkish women by Çınar et al. (2021), using multinomial logistic regression, found that the higher BMI was associated with less severe dysmenorrhea, while early menarche was licked to an increase of severe dysmenorrhea. The differences between their findings and this study may be due to methodological variations, including the use of multinomial logistic regression with three pain categories as opposed to binary logistic regression, as well as variation in sample size, participant characteristics, and sociocultural or lifestyle factors.[17] In this study, only sleep quality was independently linked with dysmenorrhea severity suggesting its potential as a modifiable factor.

Conclusion

Poor sleep quality is associated with severe of primary dysmenorrhea among medical students. It suggests that sleep plays a significant role in menstrual pain through hormonal and neurological mechanisms.

This research suggests the need for a more holistic approach to dysmenorrhea management, including concerns about sleeping patterns. Further research is needed to assess the effectiveness of lifestyle interventions.

Conflicts of Interest

There is no conflict of interest.

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Characteristics of Tonsilitis Disease

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ABSTRACT

Introduction: Tonsillitis is an inflammation of the palatine tonsils that are part of Waldeyer's ring, and is caused by microorganisms such as viruses, bacteria, and fungi that enter the body through the air or food. The spread of tonsillitis infection can also be through kisses that contain microorganisms. Acute tonsillitis is caused by streptococcus beta hemolyticus, streptococcus viridans and streptococcus pyogenes, can also be caused by viruses. Chronic tonsillitis isgenerally caused by complications of acute tonsillitis, especially those that are not treated properly. In addition to improper treatment, other risk factors for the onset of chronic tonsillitis include poor oral hygiene, physical fatigue and certain types of food.
Methods: Descriptive observational with a retrospective approach and the research design used is Cross Sectional Study.
Result: The results of the distribution of patients with tonsillitis based on age, the most at the age of 5 - 11 years, as many as 20 people (50%). Based on gender, the highest number was female as many as 23 people (58%). Based on the size of the tonsils, the largest size was T2- T2 as many as 17 patients (43%). Based on the diagnosis, there were 23 patients (58%) with acute tonsillitis.
Conclusion: Acute tonsillitis was the most common diagnosis with a patient age range of 5 - 11 years, where most were female and tonsil size was T2-T2.

Keywords: Characteristics; tonsillitis; Tabaringan health center

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Introduction

The menstrual cycle in women usually lasts 28 days, with dysmenorrhea symptoms being a common symptom. Primary dysmenorrhea, not caused by any underlying medical conditions, often happens among students.[1,2] A study reported that 49% of medical school students experience primary dysmenorrhea, in 35.5% experience severe dysmenorrhea at Tarumanagara University.[3] In addition, a university in India has reported that 45% of its medical students experience primary dysmenorrhea.[4] Furthermore, Erciyes University Turkey determined that 82.4% had primary dysmenorrhea.[5]

Tonsillitis is an inflammation of the palatine tonsils that are part of Waldeyer's ring, and is caused by microorganisms such as viruses, bacteria, and fungi that enter the body through the air or food, the spread of tonsillitis infection can also be through kissing that contains microorganism[1]. Based on the duration of time tonsillitis is classified into acute and chronic tonsillitis. Acute tonsillitis is an acute inflammation caused by streptococcus beta hemolyticus, streptococcus viridans and streptococcus pyogenes, and can also be caused by viruses[2]. Chronic tonsillitis is the most common recurrent throat disease, chronic tonsillitis usually occurs as a complication of acute tonsillitis, especially if the acute tonsillitis is not treated properly. Besides improper treatment, other risk factors for the onset of chronic tonsillitis are poor oral hygiene, physical fatigue and some types of food[3].

In some cases, large tonsils can affect the respiratory system and children usually experience additional symptoms such as snoring during sleep and shortness of breath. If the inflammation is successfully treated, the tonsils may recover to normal, but if left untreated, they may not return to normal health and recurrent infections may occur. The painful throat makes it difficult to swallow with general weakness and a foul-smelling mouth (foetor ex-ore). The tonsils appear red and swollen and the crypts are usually covered by a fibrous or purulent film, which appears as white dots or white lines. The membrane may coalesce so that the entire tonsil is covered. The glands in the neck are usually enlarged and painful [4].

Tonsillitis is considered a self-limiting disease, with 40% of symptoms resolving within 3 days and 85% of patients recovering within 1 week. However, tonsil inflammation remains common, especially in children, and can lead to other complications and in severe cases may require surgery[5].

The World Health Organization (WHO) does not publish data on the number of tonsillitis cases worldwide, but estimates that 287,000 children under the age of 15 have undergone tonsillectomy, with or without adenoidectomy. A total of 248,000 (86.4%) children underwent tonsilladenoidectomy and 39,000 (13.6%) children underwent tonsillectomy alone. Based on epidemiologic data of ENT diseases in seven provinces in Indonesia, the prevalence of chronic tonsillitis was 3.8%, followed by acute nasopharyngitis at 4.6%[3]. From several hospitals in Indonesia, the number of outpatient visits caused by

tonsillitis in the last two years, namely in 2012-2013 amounted to ± 55,383 people while outpatients caused by tonsillitis amounted to ± 37,835 people[6].

Based on this description and seeing the high prevalence of tonsillitis and the various characteristic symptoms that can be found, and there have not been many studies conducted in the Makassar city environment, so researchers are interested in conducting research to determine the characteristics of tonsillitis at Tabaringan Health Center Makassar City.

Methods

This research used a descriptive observational with a retrospective approach, the research design used is a cross-sectional study to describe the characteristics of Tonsillitis patients at Pulskesmas Tabaringan Makassar City. This research was conducted on July - August 2023 at the Tabaringan Health Center in Makassar city. The population and samples useall patients who had a history of tonsillitis disease medical records at Tabaringan Health Center, Makassar city, with the total sampling technique.

The inclusion criteria are the medical records of patients with tonsillitis at the Tabaringan Health Center in Makassar City which are in accordance with the independent variables. Exclusion criteria were illegible medical records (torn, dirty, wet), incomplete medical records (not fulfilling the independent variables), and medical records of patients with acute tonsillopharyngitis. The independent variables in this study are age, gender, tonsil size, and determination of the diagnosis of tonsillitis patients and the dependent variable is tonsillitis patients at the Tabaringan health center in Makassar city. This research use univariate analysis to identify the characteristics of data variable.

Result

This study aims to determine the characteristics of tonsillitis patients at Tabaringan Health Center Makassar City from 2019-2023. This study used a descriptive observational design by using a secondary data. Secondary data were collected from the medical records of tonsillitis patients, with81 data from the medical record there were only 40 data that met the inclusion criteria and did not have exclusion criteria. The collected data were entered and processed in the Microsoft excel application. The data is presented in tabular form accompanied by an explanation, the results of which can be seen as follows.

Table 1. Distribution of tonsillitis patients by Age

Age	N	%
5 – 11 years	20	50
12 – 25 years	10	25
26 – 45 years	10	25
Total	40	100

Source: Secondary data 2023

The table shows that the distribution of tonsillitis patients recorded in the medical records of Tabaringan health center Makassar city, based on the highest age is 5 - 11 years, namely 20 people (50%) and for ages 12 - 25 years and 26 - 45 years, namely 10 people (25%).

Table 2. Distribution of tonsillitis patients based on gender

Gender	N	%
Female	23	58
Male	17	43
Total	40	100

Source: Secondary data 2023

The table shows, the distribution of tonsillitis patients recorded in the medical records of Tabaringan health center Makassar city based, on gender is mostly in women, namely 23 people (58%) and men, namely 17 people (43%).

Table 3. Distribution of tonsillitis patients based on tonsil size

Tonsils Size	N	%
T1-T1	2	5%
T2-T1	4	10%
T2-T2	17	43%
T3-T1	2	5%
T3-T2	3	8%
T3-T3	9	23%
T4-T2	1	3%
T4-T4	2	5%
Total	40	100

Source: Secondary data 2023

The table shows, the distribution of tonsillitis patients recorded in the medical records of Tabaringan health center Makassar city, based on the size of the tonsils was mostly T2 - T2, as many as 17 people (43%), and the least size was T4 - T2, as many as 1 person (3%).

Table 4. Distribution of tonsillitis patients based on diagnosis

Diagnosis	N	%
Acute tonsillitis	23	58
Chronic tonsillitis	14	35
Acute exacerbation of chronic tonsillitis	3	8
Total	40	100

Source: Secondary data 2023

The table shows, the distribution of tonsillitis patients recorded in the medical records of Tabaringan health center Makassar city based on the highest diagnosis was acute tonsillitis, namely 23 people (58%) and the least diagnosis was acute exacerbation of chronic tonsillitis, namely 3 people (8%).

Discussion

The are 40 data of patients suffering from tonsillitis at Tabaringan health center Makassar city from

2019-2023, the results were obtained in the age group 5-11 years as many as 20 people (50%). In accordance with research conducted by Rombadi (2022), the age group 5-11 years was the age at which the most tonsillitis occurred, 21 patients (35%) [7] and in contrast to Rahmadayanti (2022), there were 13 patients (31.7%) with an age group between 15-24 years. Tonsillitis generally occurs in children between the ages of 5 and 15 years, but is less common in children less than 2 years old [8]. Typically, the tonsils reach full size between the ages of 6 and 8, and the tonsil and adenoid tissues become immunologically active between the ages of 4 and 12(5). In addition, the children habit that sometimes forget to keep their food clean and maintain oral hygiene is also one of the common problems that cause tonsillitis [9]. Bintang (2022) at H. Hanafie Muara Bungo Jambi Hospital in 2021, stated that patients aged had less than 20 years were a risk factor for the appearance of tonsillitis symptoms 4.40 times greater than patients aged more than 20 years [8].

Based on gender, this study found women as many as 23 people (58%). This is following the research that conducted by Tamara Nike et al (2021) from 70 samples, found that the most tonsillitis patients, namely 36 patients (51.4%), occurred in women [10]. In contrast the research conducted by Alvina et al (2023) from 68 samples obtained results, namely men as many as 38 people (55.9%) [11]. This result may be due to the increased nutritional requirements during adolescence. In adolescence, many girls are concerned about their body shape and often eat late. This causes girls to eat less frequently than boys and their increased calorie and protein requirements are not met, thus negatively impacting nutritional stamina [12]. In addition, women especially children are more likely to engage in activities in clean places, such as indoors, and are less adapted to dirty environments rich in microorganisms[9]. Based on the explanation above, the factor causing tonsillitis is poor oral hygiene, regardless of age or gender. In men, the risk of developing tonsillitis is due to smoking, which can cause a decrease in antibodies in the tonsils. The function of the tonsils is that if the pathogen penetrates the epithelial layer, mononuclear phagocytic cells will recognize and eliminate antigens, resulting in disruption of the function of the body's defense cells. The particles in cigarette smoke then stimulate the tonsils to produce antigens if this continues, the tonsils will become inflamed [3].

There are 40 data who experienced tonsillitis at the Tabaringan health center Makassar city from 2019-2023, the most common was T2 - T2 as many as 17 people (43%). The study by Rahmadayanti's research (2022) found the most tonsil size T2 - T2, namely 15 patients out of 41 patients with tonsillitis. In contrast to research conducted by Zuhdi et al (2020) in 66 patients with tonsillitis there were 27 patients (40.9%) who had tonsil sizes T3 - T3. One of the factors for tonsil enlargement is due to the effect of infection on the tonsils. The size of the tonsils is enlarged due to parenchymal hyperplasia or fibrinoid degeneration with obstruction of the tonsil crypts, and will worsen if there is repeated infectious

inflammation [8]. Tonsils that are repeatedly infected cannot kill all the germs, so the germs become lodged in the tonsils (focal infection). Repeated infections and focal infections cause the tonsils to work hard to fight germs by producing a lot of immune cells so that the size of the tonsils will increase rapidly beyond normal size [13].

Based on this study, the most common diagnosis was acute tonsillitis as many as 23 patients (58%). In Resky's research (2019), acute tonsillitis obtained in 66 patients (71.7%) of the 92 patients. In Rahmadayanti's research (2022), different results were obtained, namely more chronic tonsillitis, namely 35 patients (85.4%) out of 41 patients[14]. Acute tonsillitis is caused by viruses or bacteria that cause inflammation of the tonsils. It is characterized by swelling and redness of the tonsils, may be accompanied by exudates, cervical lymphadenopathy and fever >38.3°C measured rectally. Odinophagia lasts for 24 to 48 hours resembling the symptoms of the common cold[15].

Conclusion

Based on research that has been conducted on the Characteristics of Tonsillitis Patients at Tabaringan Health Center Makassar City 2019-2023, the author concluded that the characteristics based on age, most in the age group 5-11 years. Characteristics based on gender, mostly female. Characteristics based on tonsil size, the most commonly found with size T2-T2. Characteristics based on diagnosis, obtained are patients with acute tonsillitis.

Based on the research that has been done, the researchers provide several suggestions, namely, it is hoped that public health services will continue to provide education about maintaining a healthy lifestyle, it is also hoped that the community, especially parents, will pay more attention and apply a healthier lifestyle to their children from an early age so that they can get used to taking better care of their health, it is hoped that future researchers will conduct further research with a larger sample size regarding cases of tonsillitis = to develop the latest information about tonsillitis.

Conflicts of Interest

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Relationship between Diet using Food Frequency Questionnaire and The Incidence of Dysmenorrhea

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ABSTRACT

Introduction: Students' eating habits are strongly shaped by their busy schedules and active social lives, which often encourage a preference for fast food and reduce the consumption of fiber-rich foods.
Methods: This study uses a cross-sectional methodology and is an analytical observational study.
Methods: Descriptive observational with a retrospective approach and the research design used is Cross Sectional Study.
Result: The results of the distribution of patients with tonsillitis based on age, the most at the age of 5 - 11 years, as many as 20 people (50%). Based on gender, the highest number was female as many as 23 people (58%). Based on the size of the tonsils, the largest size was T2- T2 as many as 17 patients (43%). Based on the diagnosis, there were 23 patients (58%) with acute tonsillitis.
Conclusion: Acute tonsillitis was the most common diagnosis with a patient age range of 5 - 11 years, where most were female and tonsil size was T2-T2.

Keywords: Characteristics; tonsillitis; Tabaringan health center

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Introduction

Diet is an organized meal that includes the amount, type of food, which is usually consumed at a certain time[1]. The correct diet is staple foods, side dishes, fruits and vegetables, and consumed in moderation and not excessively. If it is fulfilled, it will provide sufficient energy, building substances and nutritional regulating substances for the body, making adequate nutrition for the body and not susceptible to disease because of a good immune system. Time availability, influence of friends, and economic status, education and nutritional knowledge are part of the factors that influence consumption patterns[2]. Diet is the main factor in meeting a person's nutritional needs. The body will become hungry and eventually lose weight if it is deficient in specific nutrients, particularly energy and protein in the early stages. It will also cause a decline in productivity at work[3].

During adolescence, there are several changes that can affect food consumption. During this period, physical, social and psychological changes usually occur. During adolescence, there are also changes in lifestyle, behavior, and experiences in choosing food consumed or eating habits[4]. This change in eating behavior also applies to students as a group of individuals in the adolescent stage. The diet of students who tend to prioritize practicality in choosing food. Students often consume unhealthy foods, are irregular, snack and often forget breakfast or lunch[4].

According to data collected, 49.8% of medical students only eat twice a day, and their diet of fruits, vegetables, meat, and dairy items is deemed insufficient shows that medical students do not consuming foods with balanced nutrition[5]. Increased activity, social life and busyness of students will affect their diet. Students nowadays are fond of fast food such as instant noodles, so they do not consume foods that are high in fiber. Fast food usually contains limited or low nutrients (calcium, riboflavin, vitamin A, vitamin C, folate and fiber). Additionally, fast food diets are typically heavy in calories, sugar, and fatty substances[6].

Consumption of fast food does not provide optimal nutrition for the body and only provides excess fat, sugar and sodium to the body, it can cause the risk of gynecological disorders such as dysmenorrhea[7]. The pelvic cramping discomfort known as dysmenorrhea is brought on by menstruation and the transfer of prostaglandin molecules. Dietary variables are one of the risk factors that contribute to dysmenorrhea, which frequently manifests at an early age. Eating a lot of fast food is one diet that frequently results in dysmenorrhea[8]. Omega-3 fatty acids are in modest concentrations in fast food, while saturated omega-6 fatty acids are abundant. Saturated fats trigger the release of prostaglandins via the cyclooxygenase pathway, which narrows the blood channels in the myometrium and results in dysmenorrhea[9].

The food Frequency Questionnaire (FFQ) is one of the food consumption assessment methods. The general principle in using FFQ is the frequency of food consumption as a risk factor for malnutrition. The

frequency of food consumption must be measured precisely using the FFQ method[10]. An initial investigation to determine which food elements should be on the FFQ list is the first step towards the systematic measurement of the FFQ method. The food items on the list are modified based on the relationship between the likelihood of consuming them and the development of a disease. Foods that are not associated with the risk of disease should be removed from the FFQ list. Deletion aims to be time-efficient and precise in the interpretation of results[10]. The FFQ method is semi-qualitative in that the information about the foodstuffs consumed is only in the form of names while the quantities are not strictly distinguished. The FFQ metho d only requires data on whether a certain type of food is often or not often consumed and the frequency of consumption[10].

Methods

This study uses a cross-sectional methodology and is an analytical observational study. This study used a survey strategy with questionnaire items in collecting data to determine the correlation between diet and the incidence of dysmenorrhea in students of the Faculty of Medicine, Universitas Muslim Indonesia, class of 2020, Makassar, South Sulawesi. The population in this study was 201 students of the Faculty of Medicine, Muslim Indonesia University, Class of 2020. Purposive sampling is the sample measurement method employed in this study, and it is this method that determines the research sample. It takes into account a few factors by establishing inclusion and exclusion criteria with the goal of obtaining more representative data later on. so that the sample size in this study was found to be 100 respondents who both satisfied and exceeded the requirements for being included or excluded. The independent variable in this study is diet, and the dependent variable is dysmenorrhea. A questionnaire was used as the method of data collection. Two types of data analysis were conducted with: univariate and bivariate analysis.

Result

This study was conducted using an online purposive sampling technique by distributing questionnaires via Google form on July 11 2023 to August 012023. Respondents in this study were UMI Class of 2020 medical faculty students who both satisfied and exceeded the requirements for being included or excluded. The results of this study are in the form of univariate and bivariate analysis.

Univariate Analysis

Table 1. Distribution of food frequency

No.	Variabel	Infrequently		Frequently	
		(n)	(%)	(n)	(%)
1.	Consume Carbohydrate				
	Rice	3	3%	97	97%
	Cassava	97	97%	3	3%

	sweet potato	96	96%	4	4%
	Bread	66	66%	34	34%
	Noodles	74	74%	26	26%
2.	Consume Proteins				
	Beef	81	81%	19	19%
	Chicken	32	32%	68	68%
	Lamb	97	97%	3	3%
	chicken eggs	52	52%	48	48%
	Fish	64	64%	36	36%
	tofu/tempe	42	42%	58	58%
	Nuts	77	77%	23	23%
3.	Consume Fat				
	vegetable oil	90	90%	10	10%
4.	Consume Fast food				
	fast food	42	42%	58	58%
	soft drink	51	51%	49	49%
	fried food	37	37%	63	63%
5.	Consume Fiber				
	Vegetables	47	47%	53	53%
	Fruits	60	60%	40	40%

Table 1 shows rice (97%) as the main carbohydrate source, chicken (68%) as the most frequent protein, fried foods (63%) as the most frequent fast food, and vegetables (53%) as the main fiber source.

Table 2. Research frequency distribution

Consume Carbohydrate	**(n)**	**(%)**
Infrequently	60	60%
Frequently	40	40%
Total	**100**	**100%**
Consume Proteins	**(n)**	**(%)**
Infrequently	50	50%
Frequently	50	50%
Total	**100**	**100%**
Consume Fat	**(n)**	**(%)**
Infrequently	90	90%
Frequently	10	10%
Total	**100**	**100%**
Consume *Fast food*	**(n)**	**(%)**
Infrequently	30	30%
Frequently	70	70%
Total	**100**	**100%**
Consume Fiber	**(n)**	**(%)**
Infrequently	39	39%
Frequently	61	61%
Total	**100**	**100%**
Incidence of dysmenorrhea	**(n)**	**(%)**
No dysmenorrhea	11	11%
Mild dysmenorrhea	51	51%
Moderate dysmenorrhea	30	30%

Severe dysmenorrhea	8	8%
Total	**100**	**100%**

Bivariate Analysis

Table 3. The relationship between food frequency and the incidence of dysmenorrhea

Gamma Correlation Test		
No.	**Category**	***p-Value***
1.	Carbohydrate	0.718
2.	Proteins	0.767
3.	Fat	0.956
4.	*Fast food*	0.000
5.	Fiber	0.699

Based on table 3, the correlation between the frequency of dietary patterns and dysmenorrhea is displayed in. Test results showed that the frequency of consumption of carbs, protein, fat, and fiber had a p-value > 0.05. This suggests that there isn't a meaningful connection to the prevalence of dysmenorrhea. A p-value < 0.05 was found in the gamma correlation test results regarding the frequency of fast-food eating. This demonstrates that there is a connection between the prevalence of dysmenorrhea and eating fast food.

Discussion

Dietary distribution based on food frequency

In this study, it was found that 93% of respondents obtained their carbohydrate source from rice and least often from cassava. Cassava is one type of tuber that is often found in Indonesia, even often made as a source of carbohydrates in certain areas. But the majority of Indonesians consume rice as the main source of carbohydrates. In the research of Seidelmann et al. (2017) obtained data on the consumption of energy sources from carbohydrates in Asian countries by> 60% and in this study, was found that the consumption of rice was 93%[15].

The protein sources most often obtained from chicken meat, namely 68% and the least source of protein from goat meat. In Winda's research (2016) meat, eggs and milk are livestock products that are often consumed by the community. Chicken flesh is one of the foods that significantly contributes to the requirement for animal protein. One dietary item that has animal protein in sufficient amounts to satisfy human needs is chicken flesh. The public has a strong preference for chicken meat since it is simple to prepare and cook. Furthermore, chicken meat is more affordable than other meats and has a flavor that is acceptable to all segments of society [15]. Goat meat, on the other hand, is the least popular since it is more expensive than other meats and requires more processing.

For sources of fat obtained from vegetable oil, as many as 90 respondents (90%) consume vegetable oil as a fat source infrequently. and as many (10%) respondents consume vegetable oil as a fat source infrequently. Vegetable oil or vegetable oil containing high unsaturated fat comes from extracts of nuts, seeds, avocados and olives. Vegetable oil containing high unsaturated fat is easy to find in the market, however, the price is quite expensive from other oils causing many people to rarely use it for consumption every day.

Furthermore, in this study it was found that 63% of respondents often consumed fast food obtained from fried foods. In the research of Leak et al. (2018) adolescents more often consume their own food which results in a rise in the frequency of consuming sugar-filled drinks and fast food (16). 50% of adolescents in Indonesia were found to have Na consumption more than the recommended amount every day and 50% of the consumption was sourced from fast food[15].

The respondents of this study about 53% often consumed fiber obtained from vegetables and 60% of respondents rarely consumed fruits. According to certain research, there is a relation between the availability and intake of fruits and vegetables. Research conducted by Anggraeni & Sudiarti, (2018) explains that someone with good availability of fruits and vegetables has a higher average intake of fruits and vegetables compared to respondents with reduced availability of veggies and fruits[17].

Distribution of Dysmenorrhea

This study was discovered that 51 respondents (51%) had mild dysmenorrhea, 30 respondents (30%) experienced moderate dysmenorrhea, 8 respondents (8.3%) experienced severe dysmenorrhea and 11 other respondents (11%) did not experience dysmenorrhea. Research conducted by Juniar (2015) in Jakarta on respondents aged 12-21 years, 87.5% of respondents experienced dysmenorrhea with 20.48% mild dysmenorrhea, 64.76% moderate dysmenorrhea, 14.76% severe dysmenorrhea[17]. Dysmenorrhea is often experienced by women at reproductive age, which is around 45% to 93% and the highest incidence of dysmenorrhea is experienced by adolescents[18].

Relationship between Dietary Frequency and the Incidence of Dysmenorrhea

The study's findings demonstrated that there was no significant correlation between dysmenorrhea and the frequency of consuming sources of carbs. In Tiara's research (2022) it was also found that There was no correlation found between dysmenorrhea and the frequency of consuming sources of carbs[14]. In other studies, the correlation between carbohydrate consumption and the severity of dysmenorrhea is associated with an increase in blood pressure where dysmenorrhea occurs due to vasoconstriction of blood vessels[14]. Carbohydrates are a source of increased intake, so there will be no shortening of the luteal phase. Low blood glucose concentration can cause the body to produce the hormone adrenaline. Adrenaline can

stop the effectiveness of progesterone which functions to suppress the activity of estrogen hormone so that the menstrual cycle does not become longer. Increased adrenaline hormone can cause an increase in blood pressure[19]. In the research of Uche et al. (2021) during 3 menstrual cycles respondents who experienced dysmenorrhea and consumed carbohydrates showed an increase in blood pressure. This increase in blood pressure occurs because there is an increase in Angiotensin-II and VCAM-1 which causes vascular dysfunction, but the mechanism of increasing Angiotensin-II and VCAM-1 in respondents who experience dysmenorrhea with carbohydrate consumption is unknown[20].

The Approximate Significance value in the Gamma correlation test is p-value of 0.000 (p-value <0.005) so that there is a correlation between the frequency of fast-food consumption and dysmenorrhea. In the research of Pramanik et al. (2014) also found a significant correlation between the frequency of fast-food intake with menstrual irregularities in the study and dysmenorrhea. Where dysmenorrhea is more common in adolescent girls who often consume fast food[22]. Despite the fact that the pathomechanisms behind dysmenorrhea remain incompletely known, the intricacy of the biochemical interactions involving the endocrine, circulatory, immunological, and psychological systems has been demonstrated by previous research[7]. Diet with macronutrient and micronutrient content also showed an association with dysmenorrhea although the results in each study did not consistently show a significant relationship. This can occur because in consuming food a person will more often consume a variety of foods in one meal compared to consuming only one type of food. When a person consumes various types of food, the food contains various macronutrients and micronutrients where the nutritional effects of these foods will interact with each other, which can produce bias in the study[7].

This study was found no significant correlation between the frequency of consumption of fiber sources on dysmenorrhea. This is in consistent with the study of Abu Helwa et al. (2018) which showed an insignificant relationship between fruit and vegetable consumption and dysmenorrhea[23]. Vegetables and fruits contain many vitamins, beta carotene and antioxidants. Vitamin E is fat-soluble and has a function to reduce oxidized phospholipid levels. Vitamin C is a water-soluble vitamin that provides antioxidants by removing free radicals in oxygen. Beta carotene and zinc can reduce antioxidant levels which will detoxify increased oxidant levels[24]. Vegetables and fruits contain calcium and magnesium. Previous research has studied the possible effects of a lack of calcium and magnesium intake on dysmenorrhea during menstruation. Calcium has a role in controlling how responsive muscle cells are to nerve signals. The uterine contraction-relaxation process itself is influenced by the presence of intracellular calcium which is regulated by agonizing substances that can affect the amplitude, frequency and duration of contractions. Because during menstruation there is a decrease in calcium levels in the blood, calcium intake is needed for the contraction-relaxation process[25].

Conclusion

Based on research that has been conducted on the Characteristics of Tonsillitis Patients at Tabaringan Health Center Makassar City 2019-2023, the author concluded that the characteristics based on age, most in the age group 5-11 years. Characteristics based on gender, mostly female. Characteristics based on tonsil size, the most commonly found with size T2-T2. Characteristics based on diagnosis, obtained are patients with acute tonsillitis.

Based on the data analysis and discussion conducted conclusions can be obtained namely diet based on the frequency of carbohydrate consumption most often is rice, the most frequent protein consumption is chicken meat, fat consumption is vegetable oil, the most frequent fast-food consumption is fried foods and the most frequent fiber consumption is vegetables. Furthermore, the most incidence of dysmenorrhea is moderate dysmenorrhea then mild dysmenorrhea and the least is the incidence of severe dysmenorrhea. The fast-food consumption and the prevalence of dysmenorrhea are significantly correlated among 2020 faculty of medicine Universitas Muslim Indonesia students.

Conflicts of Interest

There is no conflict of interest.

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