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Implementation of Modisco Supplementary Feeding Education for Families with Wasting Children to Improve Nutritional Readiness

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ABSTRACT

Introduction: Wasting was a nutritional problem that occurred in children under five and could affect physical and mental development. It could arise due to several factors, including inadequate nutritional intake, poor parenting, and low family economic status. This case took place in an agricultural area in 2024. The purpose of this study case was to determine the improvement of nutritional status through the provision of PMT Modisco nutrition education in the family who had a wasting child and showed readiness to improve nutrition. **Method:** This study used a descriptive case study design with one participating family with a child experiencing wasting in an agricultural area. The case study referred to family nursing care by applying nutrition education nursing interventions and was strengthened by evidence-based administration of *Moringa oleifera* Modisco ice cream. Data collection in this study used a summarized family nursing care format. **Result:** The results showed that giving PMT Modisco ice cream with Moringa oleifera helped improve the nutritional status of families with children suffering from wasting. Families gained more knowledge about good nutrition, had better attitudes toward healthy eating, and Child A's nutrition improved. This was due to the high vitamin A in Moringa oleifera, which boosted the child's appetite. The plant was also easy to find and prepare, making mothers more willing to provide nutritious food. **Conclusion:** The implementation of PMT Modisco nutrition education using *Moringa oleifera* ice cream successfully improved the nutritional status of families with wasting children, enhancing both their knowledge and attitudes toward proper nutrition. Future studies are recommended to explore the effectiveness of PMT Modisco programs across different regions and larger sample sizes to strengthen the evidence for broader application, especially in community health centers and Posyandu programs.

Keyword: Family, Modisco Moringa Oleifera, Wasting

INTRODUCTION

Wasting, or undernutrition, has become a serious public health issue in Indonesia, where the majority of the population works as farmers. Children who experience wasting are vulnerable to disease, impaired physical and mental development, and even face a high risk of death (1). If wasting is not addressed promptly, it can progress to severe wasting or malnutrition, which is one of the priorities in health development. Although Indonesia, as an agricultural country, should be able to supply nutritious food, the

incidence of wasting continues to increase annually. This trend is still not aligned with the target of the RPJMN 2020-2024, which aims to reduce the prevalence of wasting to 7% by 2024 (2).

Globally, the prevalence of wasting in 2022, as reported by the United Nations Children's Fund (UNICEF), reached 45 million children, or about 6.7% of the population under the age of five (3). According to the results of the Indonesia Nutrition Status Survey (SSGI), the national prevalence of wasting increased from 7.1% in 2021 to 7.7% in 2022 (4). In East Java Province, the prevalence rose from 6.4% in 2021 to 7.2% in 2022. In Lumajang Regency, it rose from 5.4% in 2021 to 6.9% in 2022. The highest percentage of wasting cases in Lumajang occurred in the Gesang Health Center's working area, where it increased from 11.74% in 2021 to 16.0% in 2022. Based on the nutrition status data of under-fives at Gesang Health Center in February 2024, there were 64 children identified with wasting, spread across several Posyandu areas. This high incidence of wasting was associated with the mothers' knowledge levels (5).

Maternal knowledge was statistically positively associated with the risk of wasting in toddlers; children whose mothers had low levels of knowledge had a higher risk of experiencing wasting due to their inability to provide balanced nutritious food (6). Besides maternal knowledge, unpreparedness for parenting and the family's economic status were also contributing factors to wasting, which can be divided into three categories: direct factors (nutritional intake and infectious diseases), indirect factors (household food security, parenting, health services, and the environment), and basic factors (economic level, family characteristics, and sociodemography) (7). Malnutrition causes loss of muscle mass and fat tissue, reducing the energy needed for growth, and also affects the function of vital organs and hormonal systems, putting wasted children at high risk for developmental disorders and illnesses (8). In this case, the nutrition education approach using the provision of PMT (Pemberian Makanan Tambahan) Modisco ice cream fortified with Moringa oleifera powder proved effective in increasing children's body weight (9), where PMT provides nutritious supplementary foods to meet nutritional needs aside from main meals, and Modified Dried Skimmed Milk and Coconut Oil (Modisco) is a high-energy, easily digestible food product made from dried skimmed milk and coconut oil, suitable for various food and drink recipes (10). PMT Modisco therapy acted as a complementary intervention alongside nutrition education in nursing care, teaching food preparation methods, with previous research showing that toddlers who received Modisco gained an average of 277 grams in one week (11). Adding Moringa powder to food could further increase body weight due to its nutrient content, which is 25 times higher than spinach and rich in essential amino acids, protein, minerals, vitamins, and polyphenols (12); improvements in appetite were attributed to Moringa's vitamin and mineral content, with Vitamin A levels ten times higher than in carrots helping prevent keratinization of the gastrointestinal tract (6). Moringa leaves of 614.4 nm size contain 36.249% protein (13), and protein intake could increase albumin levels, crucial for new cell formation during growth, with plasma albumin concentration serving as a major indicator of nutritional status (14). The addition of 20 grams of Moringa powder daily for 30 days could increase body weight by an average of 0.91 kg (15), while 10 grams daily for 14 days could increase body weight by 0.65 kg (16), and besides increasing body weight, Moringa could also raise hemoglobin levels in children (17) due to its high iron content, helping prevent iron deficiency that could impair linear growth in children (18).

Modisco offers a creative solution to enhance children's nutritional intake as an alternative food modification using Moringa leaves, which are easily accessible and affordable for people living in agricultural areas. The role of nurses was crucial in this implementation, as they served as a bridge between scientific knowledge of nutrition and the community in agricultural regions. The purpose of this study case was to determine the improvement of

nutritional status through the provision of PMT Modisco nutrition education in the family who had a wasting child and showed readiness to improve nutrition.

METHOD

This study used a descriptive case study design with one participating family with a child experiencing wasting in an agricultural area. The participant met the characteristic criteria of a family with a wasted child, fulfilling at least 80% of the major and minor signs, including major signs: expressing a desire to improve nutrition; and minor signs: expressing knowledge about healthy food and beverage choices, following proper nutritional intake standards, preparing safe food and beverages, and showing attitudes towards food and drinks that align with health goals. The family had a preschool-aged child or a child ≤5 years old, and the child had no allergies to animal protein. Data collection in this study used a summarized family nursing care format. To obtain accurate information, the researcher used triangulation methods through interviews, observation, and documentation studies. The nursing intervention carried out was providing nutritional education to families with wasted children in the working area of Puskesmas Gesang. The education provided was in the form of PMT Modisco Moringa oleifera, conducted over three sessions of 45 minutes each. The first session included BHSP, initial assessment, pre-test, and a demonstration of making Moringa oleifera ice cream with the family members. The second session provided education on balanced nutrition based on the "Isi Piringku" (My Plate) concept, and the third session included a post-test evaluation. All activities were conducted within a span of 10 days.

The tools/instruments used by the researcher included the child anthropometric growth index table standard from the Indonesian Ministry of Health (KEMENKES RI), metline, weighing scale, and stature meter to measure the child's weight and height. The method of analysis was conducted directly by exploring the implementation of nutritional education to families with wasted children experiencing the nursing problem of readiness to enhance nutrition. After implementation, actual results were obtained by comparing the analyzed theory with the facts gathered from interviews and post-tests with the family members caring for the wasted child, as well as the child's weight measurements after the nutritional education intervention using PMT Modisco Moringa oleifera ice cream. The discovered facts were then compared with the re-analyzed theory to elaborate the researcher's opinion. This study received ethical approval from the Ethics Committee of the Faculty of Nursing, University of Jember No. 171/UN25.1.14/KEPK/2024 on May 7, 2024.

RESULT

The assessment was conducted on May 6, 2024, at 1:00 PM WIB at the residence of Mr. M's family in Lumajang, after obtaining informed consent from Mrs. S, the mother of Child A, the third child aged 35 months who is experiencing readiness issues in improving nutrition. Mr. M's family is a nuclear family of Javanese ethnicity and Islamic faith, with the primary economic source from entrepreneurship and additional income from online sales. The family's developmental stage falls into the stage of families with teenagers, even though Child A is still a toddler. The family’s health history is generally good, with the main complaint being Child A’s difficulty in gaining weight, despite having completed basic and booster immunizations. The home environment is in good condition, clean, and meets sanitation standards. The family communication structure uses the Javanese language daily, with strong emotional, moral, and material support patterns. Family roles function effectively, with Mrs. S taking more responsibility for healthcare decisions. Nutritional improvement efforts for Child A included providing vitamins, milk, nutritious meals, and routine visits to the posyandu (integrated health service post), reflecting the family’s good caregiving capabilities.

The family's efforts to fulfill clothing and food needs are supported by Mr. M's monthly income, which totals around 10–11 million IDR. This income is allocated for the schooling of An. R and An. S, allowances for the three children, additional needs for Mrs. S, food and kitchen necessities, electricity, home maintenance, and vehicle maintenance. In utilizing community resources, Mr. M benefits from their house's strategic location near the village center and market by operating a building materials store in front of their home. A short-term stressor for Mr. M's family is Child A often not finishing meals, which makes Mrs. S feel impatient, stressed, and sometimes angry. A long-term stressor is Child A's persistent difficulty in gaining weight, leaving Mrs. S confused despite trying various methods. In response to these stressors, Mrs. S tries to serve appealing meals that Child A likes and often asks him daily about his food preferences. Mr. M also provides support by helping to buy the foods Child A requests and reassuring Mrs. S whenever she starts feeling stressed.

The family's overall nutritional status is good. Mrs. S consistently cooks healthy homemade meals, including vegetable soups, stir-fried green beans with carrots, moringa dishes, and various preparations of fish, chicken, beef, and eggs. Mrs. S mentioned that she follows the "four healthy, five perfect" nutrition standard, prepares meals herself, and avoids fast food or instant foods. However, Child A is selective about food texture, taste, and temperature. If the food's texture or temperature changes, he tends to stop eating. To address this, Mrs. S also provides additional supplements to boost appetite and purchases fortified milk.

Physical examination of Child A revealed a body weight of 10 kg, height of 89.5 cm, and upper arm circumference of 10.5 cm. His scalp hair appeared black, clean, and sufficiently thick. No jugular vein distension or thyroid enlargement was observed in the neck. Eye examination showed white sclera and pink conjunctiva, with pupils being isochoric. The nose appeared clean without excessive rhinorrhea. The mouth was clean, with complete baby teeth, moist mucosa, and no ulcers. The ears were clean, and no accessory respiratory muscle use was noted, with symmetrical chest wall movement. Upper and lower limb movements were normal, with fair skin color, no lesions, and a skin turgor and CRT (capillary refill time) of less than two seconds. The current health issue reported by Mrs. S is Child A's underweight condition and their desire to improve his weight. The family's hope is to find an effective, easy-to-implement way that Child A will accept and enjoy to help him achieve appropriate weight gain for his age. They also hope healthcare workers can develop more nutrition-focused programs that reach all layers of the community.

The intervention for Child A in meeting his nutritional needs involved the implementation of Modisco Supplementary Feeding Education, which provided education to Mrs. S about the importance of giving additional nutritious foods based on Modisco (modified biscuits/porridge with balanced nutrition) to support Child A’s growth and development. The education included easy preparation methods using local ingredients, appropriate feeding schedules, and menu variations to stimulate appetite. In addition, direct assistance was provided in preparing and serving Modisco at home. The implementation of the nutrition education PMT Modisco moringa oleifera ice cream carried out for Mr. M’s family with a child experiencing wasting involved providing moringa oleifera ice cream with a serving size of 100 ml containing 10 grams of moringa oleifera powder for 10 days. There was an improvement in the nutritional status in the nursing problem of readiness for enhanced nutrition in Mr. M’s family with a child experiencing wasting after the implementation of the nutrition education PMT Modisco moringa oleifera ice cream, one of which was the improvement of Child A’s BMI, with weight increasing from 10 kg to 10.5 kg. The nursing evaluation indicated that Mrs. S successfully understood the concept of Modisco-based supplementary feeding,

demonstrated the skills needed to prepare it, and committed to providing it regularly. Child A began showing increased interest in eating and enthusiasm for consuming the supplementary foods and incresed weight. Mrs. S also reported early signs of weight gain and remained diligent in monitoring Child A's growth at the posyandu, indicating initial success in supporting readiness for fulfilling nutritional needs.

DISCUSSION

The potential nursing problem regarding the family's readiness to improve nutrition for Child A stems from the ongoing nutritional issues experienced. Child A has difficulty gaining weight, and based on anthropometric standards, Child A is classified as experiencing wasting. The direct factor causing wasting in Child A is inadequate nutritional intake. Although Child A's appetite is generally good, the portion size consumed during meals is insufficient to meet nutritional needs. Child A tends to eat only foods they prefer and stops eating if there are changes in texture, temperature, or taste. These findings were obtained through interviews and direct observation with a family member, Mrs. S, Child A's mother. Mrs. S stated that there is no history of illness causing weight loss in Child A; however, there is a link between Child A's current body stature and Mr. M's stature during his childhood. According to the researcher, hereditary factors play a significant role, which aligns with Diagama's findings that genes and parental inheritance influence the nutritional status of toddlers (19).

Mrs. S, who married at the young age of 17 and now has three children, the eldest being 13 years old, places Child A at higher risk of experiencing nutritional problems. Although there is no direct correlation between the number of children and a toddler's nutritional status, mothers under the age of 20 are 3.927 times more likely to have toddlers with poor or undernutrition status (20). The researcher believes that nutritional issues in children can also be caused by mothers' lack of readiness for parenthood when they marry and conceive at a young age, impacting parenting habits passed down to subsequent children. The potential nursing problem of readiness to improve nutrition is appropriate to be established in Mr. M's family nursing diagnosis. Mrs. S expressed a desire to increase Child A's weight and prepare nutritious meals for the family, demonstrating knowledge of healthy food sources like vegetables, eggs, meat, and fruits, aligning with the "four healthy five perfect" guideline. Mrs. S regularly cooks nutritious meals and stores food properly in refrigerators and special food racks. The family avoids fast food, as evidenced by the absence of processed food products at home. In caring for Child A, Mrs. S is often supported by Mr. M, who readily helps, especially when Mrs. S is busy with guests.

There is a correlation between family support and toddler nutritional status (21). This aligns with field findings, where mothers are better able to provide balanced meals when receiving active support from fathers. Conversely, if the father is indifferent to nutritional needs, the mother may show similar negligence. Wandani's study indicates that good parenting alone does not guarantee better nutritional outcomes compared to less optimal parenting (22). Thus, readiness to improve child nutrition in a family requires mutual support between parents, reinforced by the mother's awareness and knowledge in providing balanced meals. Additionally, economic status and ease of access to nutritious food also play critical roles. According to the Indonesian National Nurses Association (PPNI) in the Indonesian Nursing Diagnosis Standards (SDKI), readiness to improve nutrition is defined as a nutritional intake pattern sufficient for metabolic needs that can still be enhanced (23). More than 80% of major and minor signs were fulfilled, proven by Mrs. S's statements about following the "four healthy five perfect" nutrition standard, regularly preparing healthy meals, and expressing a desire to increase Child A's weight.

The family's readiness and ability to meet nutritional needs are categorized as very good, especially given their agricultural environment where nutritious food sources like Moringa oleifera are abundant and easily processed into various dishes. Besides the potential issue of readiness to improve nutrition, there is a risk of growth disturbances for Child A, but since this is still a risk (not an occurring problem), the researcher prioritized addressing the existing potential problem. The nursing intervention conducted in Mr. M's family included nutritional education, particularly the preparation of Modisco Moringa oleifera ice cream, and education about the "My Plate" balanced nutrition guideline. The intervention plan aligned with the family's potential and included interventions such as nutrition education (I.12395) and child feeding education (I.12403) (24). The ice cream preparation demonstration was conducted with Mrs. S during the first visit, assisted by health cadres and experts from Gesang Community Health Center. A dosage of 10 grams of Moringa oleifera powder per serving was used based on Yadav's study, which reported an average weight gain of 0.86 kg in children after ten days of consuming fortified food (25).

The selection of Moringa oleifera was appropriate considering the family's agricultural setting where it is commonly available and culturally accepted. This cultural familiarity is expected to support its continued use. During the first visit, Child A's weight was measured at 10 kg and height at 89.5 cm, categorizing Child A within the -3 to -2 standard deviation range according to Indonesian Ministry of Health criteria for wasting (5). In the second meeting, health education on wasting and balanced nutrition was provided, alongside teaching Mrs. S to identify Child A's preferred and non-preferred foods. Mrs. S quickly grasped the concepts, able to explain wasting and identify Child A's food preferences (favoring vanilla- and milk-flavored foods while disliking mushy or unfamiliar textured foods). Her rapid progress is attributed to her higher education level, which supports better knowledge acquisition. The third meeting involved evaluation and termination; Mrs. S could independently prepare the Moringa oleifera ice cream, explained the concept of wasting, and demonstrated improved menu variations at home. Child A's weight increased to 10.5 kg while height remained constant. However, toddler weight fluctuations due to mood changes or social interactions were noted as a limitation. Following the intervention, improvements were noted in nutritional knowledge, Child A's BMI, food behavior, and overall family understanding of balanced nutrition.

CONCLUSION

Based on the results of the research and discussion regarding the implementation of nutrition education through the provision of PMT Modisco to families with a child experiencing wasting in agricultural areas, it can be concluded that the characteristics of the nursing problem of readiness for enhanced nutrition in Mr. M's family with a child experiencing wasting included the major sign of expressing a desire to improve nutrition and fulfilled all the minor signs of the nursing problem of readiness for enhanced nutrition. The implementation of the nutrition education PMT Modisco moringa oleifera ice cream carried out for Mr. M's family with a child experiencing wasting involved providing moringa oleifera ice cream with a serving size of 100 ml containing 10 grams of moringa oleifera powder for 10 days. There was an improvement in the nutritional status in the nursing problem of readiness for enhanced nutrition in Mr. M's family with a child experiencing wasting after the implementation of the nutrition education PMT Modisco moringa oleifera ice cream, one of which was the improvement of Child A's BMI, with weight increasing from 10 kg to 10.5 kg.

Conflicts of interest

The researcher declares that there is no conflict of interest in this research.

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