ORIGINAL ARTICLE

A Comparison of Knowledge, Attitude and Practices Related to Milk and Dairy Products among Male and Female Orphanage Adolescents in Kuantan, Pahang

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ABSTRACT

Background: Adequate milk and dairy product intake throughout life is essential, particularly among adolescents, for their growth and bone health due to dietary calcium content. Nevertheless, research regarding knowledge, attitude, and practices related to milk and dairy products among Malaysian orphanage adolescents according to gender is scarce. Hence, this study aimed to determine the knowledge, attitude, and practices towards milk and dairy products among male and female residents of orphanage institutions. **Methods:** In this cross-sectional study, seventy (n=70) secondary school-age adolescents (13-17 years old) were recruited through convenience sampling from five (n=5) orphanage institutions in Kuantan, Pahang. Data were collected using a self-administered questionnaire that consisted of sociodemographic information, knowledge, attitude, and practices of milk and dairy products. The data were analysed with SPSS software using chi-square and independent t-tests, at the statistically significant level of $p<0.05$. **Results:** The mean (± SD) knowledge score was 7.87 ± 1.23. Most respondents were categorized in the good knowledge category with the percentage of 70% (n=49), 25.7% (n=18) in the moderate category, and only 4.3% (n=3) of them scored in the poor category. Positive attitudes were demonstrated in more than 50% respondents, although a misconception that milk contributes to weight gain was identified. About 48.5% (n=34) of participants drink milk every day, but only 21.4 % of subjects (n=15), or approximately only one in five of the respondents, consumed two glasses of milk per day. No significant gender differences were identified for knowledge, attitude, and practices. **Conclusion: The** Majority of adolescents in orphanage institutions showed good knowledge and positive attitudes towards milk and dairy products, but lower intake than recommended, with no differences by gender. Nutrition education and institutional supports are warranted to enhance dairy intake for optimal growth in this population.

INTRODUCTION

Milk and dairy products are widely recognized as essential components of a balanced diet due to their high nutritional value and contribution to human growth and health. The consumption of milk has increased over the past few decades as studies show that milk is rich in nutrients (Kourkouta Lambrini et al., 2020; Givens., 2020). Besides, they have high-quality protein, calcium, phosphorus, vitamin D, and vitamins B that are important for bone development, muscle function, and metabolic process (Geller et al., 2022). The Malaysian Dietary Guidelines (MDG) and Recommended Nutrient Intake (RNI) for Malaysia highlighted that the inclusion of milk and dairy products is needed as part of daily intake (RNI, 2017; MDG, 2020). Based on the requirements, adolescents need to consume 1300 mg of calcium daily. Despite these recommendations, the consumption of milk and dairy products is still inadequate among adolescents in Malaysia (Sallehuddin et al., 2021; Shlisky et al., 2022).

Furthermore, children and adolescents who are living in orphanage institutions are more vulnerable than the population in terms of nutritional health (DeLacey et al., 2020; Shaziman et al., 2017). They are at high risk of malnutrition, impaired intellectual growth in the early years, and loss of family attachment. A study in Lahore, Pakistan, highlighted that the orphaned adolescents had subclinical deficiencies due to improper dietary habits (Khan et al., 2024). Besides, orphaned children are highly susceptible to inadequate nutrition due to factors like insufficient care, inadequate hygiene, and limited awareness (Safa et al., 2024).

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Nutrition is one of the important aspects in the development of adolescents. Therefore, assessing knowledge, attitudes, and practices (KAP) related to food and nutrition provides valuable insights into how individuals understand and apply nutritional information in their daily lives (Marías & Glasauer, 2014). From the previous study, one of the factors that is related to milk and dairy consumption is insufficient nutritional knowledge (Hamulka et al., 2024). Hence, another study revealed that the consumption of dairy products was higher with good nutritional knowledge (Mashallah Mohamed Abdul-Aziz et al., 2021). In Malaysia, a cross-sectional survey among secondary school students showed that only 23.2% of adolescents reported consuming milk or milk products at least twice daily over the past 30 days (Salehuddin et al., 2022). Furthermore, analysis of the South East Asian Nutrition Surveys (SEANUTS) data showed that the prevalence of vitamin D insufficiency was lower among dairy consumers compared to non-dairy consumers, 39.4% and 53.8%, respectively (Bao et al., 2018).

While previous studies have explored KAP related to milk and dairy consumption among the general adolescent population, this study aimed to focus on adolescents living in orphanage institutions. Despite the various causes of insufficient intake, health behaviours may be influenced by various factors, including knowledge and attitude (Alves, 2024). To date, no study has been conducted in Malaysia to compare KAP related to milk and dairy products among male and female residents of orphanage institutions. Therefore, this study aimed to compare KAP related to milk and dairy products among residents of orphanage institutions in Kuantan, Pahang, according to gender.

MATERIALS AND METHODS

Study Design and Population

A cross-sectional study was conducted among orphanage residents in five selected orphanage institutions in Kuantan, Pahang. The participants were selected based on inclusion criteria, which were male and female adolescents aged 13 to 18 years old from the institutions and were free from physical and mental disabilities. Meanwhile, participants who had milk and dairy product intolerance or allergy, or who had any medical illness were excluded from this study.

Sampling Method

The estimation of sample size was based on an expected prevalence of inadequate dietary calcium intake among adolescents (Chee et al., 2008), with 80% power and a 7% margin of error. After accounting for a 10% non-response rate, the final minimum required sample size was 35 adolescents per group. Hence, a total of seventy (n=70) respondents were required for comparison between gender (n=35 male, n=35 female).

A convenient sampling method was conducted for the recruitment of the participants. Thus, participants who fulfilled the inclusion criteria were provided with an informed consent form to fill in for their voluntary participation. Next, a self-administered questionnaire was distributed. The questionnaire consisted of two main parts: (1) demographic information that included gender, year of study in secondary school, and race, health status, and (2) questions assessing knowledge, attitudes, and practices related to milk and dairy products among residents of orphanage institutions in Kuantan, Pahang. The questionnaire was adopted from Millen et al. (2005), and a pilot test was performed before the study's conduct. For knowledge, a total of nine questions were asked regarding milk and dairy products. The respondents received one mark for each correct answer and 0 marks for a wrong answer. The knowledge score was classified into three good categories (≥8 or above), moderate (6 -7), and poor (≤5).

Data Analysis

All data were analyzed using SPSS version 12.0. Descriptive statistics were used to analyze demographic information. Meanwhile, knowledge, attitudes, and practices related to milk and dairy products among female and male residents of orphanage institutions in Kuantan, Pahang were examined using independent t-test and a chi-square test. P value <0.05 was set as statistically significant.

Ethics Application

Ethics approval was obtained from the International Islamic University Malaysia (IIUM) Research Ethics Committee (IREC), IREC NO: IREC 2018-185.

RESULTS

Sociodemographic Characteristics

A total of seventy (n=70) male and female residents of orphanage institutions from Kuantan, Pahang, participated in this study. The respondents' age ranged between 13 to 17 years old, with the mean (±SD) of 14.29 ± 2.04 years old. Table 1 shows the sociodemographic characteristics of the study participants.

Table 1: Sociodemographic characteristics of participants (n=70)

Variables	n	%
Form (in Secondary School)		
Form 1	23	32.9
Form 2	19	27.1
Form 3	10	14.3
Form 4	9	12.9
Form 5	9	12.9
Gender		
Male	35	50
Female	35	50
Race		
Malay	69	98.6
Indian	1	1.4

The majority of participants were Form 1 (32.9%), followed by Form 2 (27.1%), Form 3 (14.3%), Form 4 (12.9%) and Form 5 (12.9%) respectively. 98.6% (n=69) respondents were Malay, while only 1.4% (n=1) was Indian participant.

Knowledge, Attitude and Practice regarding Milk and Dairy Products

Knowledge

The mean (± SD) knowledge score regarding milk and dairy products of all participants was 7.87 ± 1.23. Most respondents were categorized in the good knowledge category, with the percentage of 70% (n=49), 25.7% (n=18) of them in the moderate category, and only 4.3% (n=3) in the poor category. Table 2 presents the knowledge score towards milk and dairy products according to gender.

Table 2: Knowledge score towards milk and dairy products among male and female participants

Variable	Gender	
	Male (n=35) n (%)	Female (n=35) n (%)
Good for health		
Yes	32 (91.4)	35 (100)
No	3 (8.6)	0 (0)
High in calcium		
Yes	34 (97.1)	33 (94.2)
No	1 (2.8)	2 (5.7)
Vital for bone, teeth, brain		
Yes	33 (94.2)	34 (97.1)
No	2 (5.7)	1 (2.8)
Recommendation to drink 2 glasses/day		
Yes	26 (74.2)	27 (77.1)
No	9 (25.8)	8 (22.9)
Vital for children growth		
Yes	33 (94.2)	35 (100)
No	2 (5.7)	0 (0)
Contribute to being fat		
Yes	4 (11.4)	2 (5.7)
No	31 (88.6)	33 (94.2)
Only drink when sick		
Yes	5 (14.2)	1 (2.8)
No	30 (85.7)	34 (97.1)
In the food pyramid, milk and dairy products should be consumed moderately		
Yes	25 (71.4)	25 (71.4)
No	10 (28.6)	10 (28.6)
Milk should be consumed throughout life, not only during childhood		
Yes	23 (65.7)	29 (82.8)
No	12 (34.2)	6 (17.1)

An independent t-test was conducted to compare knowledge of milk and dairy products between males and females. There was no significant difference (p=0.064) for knowledge score on milk and dairy products between male and female adolescents (Table 3). The mean score for male is 7.60± 1.42 while the mean score for females is 8.14± 0.94.

Table 3: Total knowledge score of milk and dairy products among male and female participants

Gender	n	Mean	SD	Mean difference (96% CI)	t statistics	df	p-value[a]
Male	35	7.60	1.42	-0.543	-1.885	68	0.064
Female	35	8.14	0.94				

Attitude

Table 4 shows the respondents' attitude regarding milk and dairy products. Majority of the respondents perceived milk as tasty (90%, n=63). For this question, 85.7% (n=30) male answered 'yes' and 94.2% (n=33) female answered 'yes'. The results demonstrated that 58.5% (n=41) would read food labels when buying milk and dairy products. 64.2% (n=45) would drink milk without instructions from

fellows. Most male (74.2%, n=26) and female (68.5%, n=24) respondents responded 'yes' to encouragement from social media. Nevertheless, no statistically significant findings were identified for all attitude towards milk and dairy products between male and female respondents.

Table 4: Attitude towards milk and dairy products among male and female participants

Variable	Gender		Chi-square X^2	p-value[a]
	Male (n=35) n (%)	Female (n=35) n (%)		
Tasty and delicious				
Yes	30 (85.7)	33 (94.2)	1.429	0.232
No	5 (14.2)	2 (5.7)		
Price is affordable				
Yes	23 (65.7)	30 (85.7)	3.807	0.051
No	12 (34.2)	5 (14.2)		
Suggestion from fellows to drink milk				
Yes	21 (60)	25 (71.4)	1.014	0.314
No	14 (40)	10 (28.6)		
Read the label when buying milk and dairy products				
Yes	17 (48.5)	24 (68.5)	2.885	0.089
No	18 (51.5)	11 (31.5)		
Drink without any instruction from fellows				
Yes	25 (71.4)	20 (57.1)	1.556	0.212
No	10 (28.6)	15 (42.9)		
Encouragement from social media				
Yes	26 (74.2)	24 (68.5)	0.280	0.597
No	9 (25.8)	11 (31.5)		

[a]Chi-square test

Practice

Table 5 shows the practice towards milk, yogurt, and cheese consumption among orphanage residents. Results showed that the majority of respondents, 84.3% (n=59) like to drink milk, of whom 44.3% (n=31) were male and 40% (n=28) were female, respectively.

The majority of the respondents like to eat yogurt (82.8%, n=58) which represents 77.1% male and 88.5% female, respectively. For the type of yogurt, the distribution of preferences of full cream yogurt and low-fat yogurt from all respondents was similar which is 32.8% (n=23) respectively, followed by free fat yogurt 14.2% (n=10) and 17.1% (n=12) not eating yogurt.

For cheese preferences, 71.4% of respondents like to eat cheese, 41.4% (n=29) were male, and 30% (n=21) were female. Regarding the type of cheese, low-fat cheese is the most preferred by female participants, whilst most males prefer cheddar cheese.

Table 5: Milk, yogurt, and cheese consumption among male and female participants (n=70)

Variables	Gender	
	Male (n=35) n (%)	Female (n=35) n (%)
MILK		
Like to drink milk		
Yes	31 (88.5)	28 (80)
No	4 (11.5)	7 (20)
Flavour of milk		
Full cream milk	4 (11.4)	6 (17.1)
Low-fat milk	3 (8.5)	1 (2.8)
Strawberry	7 (20)	6 (17.1)
Chocolate	14 (40)	18 (51.4)
Coffee	3 (8.5)	0 (0)
Green tea	1 (2.8)	1 (2.8)
Honey	2 (5.7)	1 (2.8)
Corn	0 (0)	0 (0)
Others	0 (0)	0 (0)
Not drinking milk	1 (2.8)	2 (5.7)
YOGURT		
Like to eat yogurt		
Yes	27 (77.1)	31 (88.5)
No	8 (22.8)	4 (11.5)
Type of yogurt		
Full cream	12 (34.2)	11 (31.4)
Low fat	6 (17.1)	17 (48.5)
Free fat	7 (20)	3 (8.5)
Others	2 (5.71)	0 (0)
Not eating yogurt	8 (22.8)	4 (11.4)
Flavour of yogurt		
Original	3 (8.5)	3 (8.5)
Strawberry	9 (25.7)	9 (25.7)
Blackcurrant	2 (5.7)	6 (17.1)
Mixed fruits	7 (20)	11 (31.4)
Kiwi	1 (2.8)	0 (0)
Mango	5 (14.2)	2 (5.7)
Not eating yogurt	8 (22.8)	4 (11.4)

CHEESE		
Like to eat cheese		
Yes	29 (82.8)	21 (60)
No	6 (17.2)	14 (40)
Type of cheese		
Cheddar	14 (40)	10 (28.5)
Low fat	13 (37.1)	13 (37.1)
Less salt	5 (14.2)	6 (17.1)

Table 6 demonstrates intake of milk according to gender, comprised of 80% (n=28) males and 62.8% (n=22) females, respectively. Moreover, 48.5% consumed at least 1 serving of milk per day, and only 21.4% (n=15) or one out of five respondents achieved the recommendation of taking two glasses of milk daily. Overall, 28.5% (n=20) of the adolescents reported not drinking milk at all. Non-consumption was higher among females (18.5%), and more than adequate consumption (>2 glasses) was higher among males (7.14%). Nevertheless, no statistically significant difference in practices was found between males and females.

Table 6: Frequencies of milk, yogurt, and cheese intake among male and female participants

Variables	**Gender**			
	Male n (%)	**Female n (%)**	**Chi square X^2**	**p-value[a]**
MILK				
Daily milk consumption (1 glass= 250 ml)				
>6 times	0 (0)	0 (0)	7.901	0.095
≤ 6 times	28 (80)	22 (62.8)		
YOGURT				
Daily yogurt consumption (1 small container = 125 g)				
>6 times	0 (0)	0 (0)	1.619	0.445
≤ 6 times	17 (48.5)	17 (48.5)		
CHEESE				
Daily cheese consumption				
>6 slices	0 (0)	0 (0)	4.990	0.172
≤ 6 slices	14 (40)	14 (40)		

[a]Chi-square test

DISCUSSION

This study aimed to compare knowledge, attitude, and practice related to milk and dairy products among male and female orphanage adolescents in Kuantan, Pahang.

Knowledge

Our study demonstrated that most adolescents from orphanage institutions were categorized in the good knowledge category, whilst the mean knowledge is in the moderate category. In contrast, Shaziman et al. (2017) reported poor nutritional knowledge among the majority of orphanage residents in Malacca and Selangor. The nutritional education provided in the orphanage settings could help improve their knowledge, which could subsequently improve their practice on milk and dairy products (Pysz et al. 2015). Milosavljević et al (2015) highlighted that knowledge regarding food or beverages is particularly important to health as it is associated with eating behaviour, including dietary intake, frequency of intake, and preference. However, understanding of this topic is still scarce, especially considering the adolescents' living environments in orphanage institutions and their influence on their intake.

In addition, the present study found no significant mean difference in knowledge of milk and dairy products between male and female respondents. Other studies among adolescents identified contrasting findings in which higher nutritional knowledge was identified among females than males (Naeeni et al. 2014, Tallarini et al. 2014). For the question 'milk contributes to being fat', the result identified that more than half respondents disagreed. In contrast to a survey by Stice et al. (2011), they demonstrated that children's concerns about a healthy diet were related to body image rather than diet-related chronic diseases. Despite this, other studies reported that there is a misconception that milk is fattening, which may lead children, especially females, to limit their milk intake to lose or maintain weight (Dror 2014, Censi et al. 2020).

Besides, participants in the present study responded that milk is good for humans. This result showed that most of the adolescents were aware of the benefits of milk for them. This is also aligned with Bus & Worsley (2003) findings that the participants thought that drinking milk makes them healthy, and taste was an important characteristic for their milk choice.

Attitude

Our findings demonstrated that the majority of respondents had positive attitudes towards milk and dairy products, although a misconception that milk contributes to weight gain was identified. This is supported by Louie et al. (2011) demonstrated that weight-related outcomes can influence attitudes towards milk among young individuals. Besides, Shaziman et al. (2017) demonstrated that 67.1% of adolescents living in orphanage institutions had a good nutritional attitude. Larson et al. (2006) identified that males had a higher taste preference for milk than females; whilst this preference in both genders showed a significant positive correlation with greater calcium intake. Nevertheless, our study found no significant differences for all attitude components between male and female respondents; related to reading the food labels when buying milk and dairy products, suggestions and instructions from caretakers to drink milk, and encouragement from social media.

Taste appears to be an important factor influencing adolescents' food choices (Giskes et al., 2005), including their decision to drink milk (Racey et al., 2017). From this, it can be concluded that milk flavour will influence adolescents' milk drinking behaviour. This is in line with a study conducted by Bus & Worsley (2003) in which dairy milk is considered to have good sensory properties by the majority of respondents.

Parental influence is an important factor in shaping adolescents' attitudes toward milk and dairy products (Schiano et al., 2022). In this case, caretakers in the orphanage institutions could play a significant role in enhancing adolescents' attitudes, which can subsequently contribute to adequate intake. Moreover, school-based intervention can positively influence adolescents' choice of healthier dairy product options (Tavares Filho et al., 2025). Another factor that influences milk intake is affordability. Although our present study did not find differences between genders, most respondents agreed that the price of milk and dairy products is affordable. Taheri et al. (2017) demonstrated that the choice of dairy products among Malaysians is affected by price, along with the quality and brand of the products.

Practice

Our findings indicated that most respondents like to drink milk, whilst 48.5% consumed at least 1 serving of milk per day. Although it is likely that other type of dairy products was consumed from other sources, it is evident that consumption of milk as a beverage was suboptimal. This corresponds to attitudes and beliefs about a particular food predict individuals' consumption (Wham & Worsley, 2003, Shaziman et al., 2017). There may be knowledge and attitude factors underlying inadequate milk consumption that require attention, in which nutrition education programs are beneficial to promote more healthful behaviours (Wang et al., 2015).

Malaysia Dietary Guideline for Children and Adolescents (2013) indicated that adolescents should consume three servings of milk and dairy products per day, whilst the updated Malaysia Dietary Guideline for Children and Adolescents (2023) recommended 2 servings per day for female and 3 servings per day for male adolescents respectively. However, only one in five (21.4%) of our respondents achieved the intake of two glasses of milk daily. Non-milk drinkers were higher among females, whilst more male respondents consumed at least two glasses of milk daily. Noteworthy, our finding is parallel with the National Health Morbidity Survey in 2022 among Malaysian adolescents that reported 23.2% milk or milk products consumption of two times per day within the previous 30 days, with no significant intake difference between gender (Institute for Public Health, 2022).

Our study also identified that there was no significant difference in practice towards milk and dairy products between males and females. Contrary finding was reported by Larson et al. (2006) as male adolescents have higher consumption than females. An Iranian study demonstrated that being male is a significant contributor to low milk and dairy product intake (Shokrvash et al. 2015). The authors also highlighted that female adolescents have significantly reached the recommended three servings of recommended milk and dairy products intake compared to males.

Availability of milk at home (Arcan et al., 2007) or schools (Lee et al., 2019) was consistently associated with higher milk intake. According to Hanson et al (2005), increased availability of milk and dairy products in the household can be a contributor to promoting the consumption, which will replace or eliminate the consumption of carbonated drinks among adolescents. In this present study, the respondents stay at orphanage institutions. Thus, most of their daily dietary intake is based on the prepared meals in the institutions, which play a vital role in meal provision.

Limitations and Strengths

Limitations of this study include that the study was conducted only in five selected orphanage institutions in Kuantan, Pahang. This would limit the generalizability of the results of this study. Other than that, the data were self-reported. Potential errors from memory and

estimation of portion size of milk, yogurt and cheese intake may occur due to children's cognitive ability to record or remember their diets. Despite of that, the strength of this study is being at the forefront in comparing knowledge, attitude and practices of milk and dairy products consumption among orphanage adolescents by gender.

CONCLUSION

In conclusion, the present study provides insights into the knowledge, attitude, and practice of milk and dairy products consumption among the residents of orphanage institutions in Kuantan, Pahang, with no significant differences identified between male and female adolescents. Milk intake among most respondents was lower than the recommendation for Malaysian adolescents, although the majority of them have good knowledge and attitude.

For future research, a larger sample size that incorporates respondents from orphanage institutions across various states, rural and urban regions is recommended. Besides, dietary aid tools can be used to facilitate participants in answering the questionnaire, such as using household measurements and pictorial design to estimate their intake. Nutrition intervention in this population and institutional support is warranted to improve their knowledge, attitudes, and practices of milk and dairy products.

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