Knowledge and attitude of Filipino primary caregivers on sugary foods and dental caries among preschool children

Janelle Kirsten O. Go[1], and Michael Antonio F. Mendoza*[2]

[1]College of Dentistry, University of the Philippines Manila
[2]Department of Community Dentistry, College of Dentistry, University of the Philippines Manila

ABSTRACT

Objectives. Sugar consumption significantly increases dental caries risk. Primary caregivers, usually mothers, make decisions on purchasing and preparing foods for their children. However, good knowledge and attitude may not necessarily translate to better practice. This study aimed to determine the knowledge and attitude of primary caregivers on sugary foods and beverages and dental caries and the association to the frequency of their consumption by their preschool children. **Methodology.** Primary caregivers of preschool children enrolled in the Philippine Christian University Kiddie Kollege participated in the analytical cross-sectional study (n=46). Data were collected using self-administered questionnaires for knowledge and attitude, and the Food Frequency Questionnaires (FFQ) for practices (i.e., frequency of the children's sugary foods and beverages consumption). Scores of the participants were categorized based on the number of correct answers. Fisher's exact test and t-test were used to assess the association between the variables. **Results.** Among the participants, 56.52% had high knowledge, 82.61% had good attitude, and 84.78% had good practices (i.e., children with low frequency of consumption). No significant association was found between the knowledge, attitude, and practices (KAP) of the primary caregivers and their demographic profile. The association between the knowledge and attitude of the primary caregivers and the children's consumption was also not statistically significant. **Conclusion.** No significant association was found between demographic profile and knowledge, attitude, and practice (KAP). Knowledge and attitude of primary caregivers also had a weak association to their children's consumption of sugary foods and beverages. This, however, may be due to the limited sample size and distribution where majority of the respondents were mothers. Nevertheless, this study provides insights on the subject in the Philippine setting.

*Corresponding author
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INTRODUCTION

Dental caries is one of the most prevalent public health problems worldwide. Diet, particularly free sugars intake, is the most important risk factor for dental caries (Moynihan 2016). The increase in the availability of sugary foods in the market has led to the increase in sugar consumption and dental caries incidence

KEYWORDS

caregivers, child, preschool, sugars, dental caries, sugar consumption

among Filipino children (Yabao et al. 2005). Low vegetable intake was also observed in 6-12 year old Filipino children which may be a result of lack of access, financial constraints, or inadequate nutrition knowledge (Angeles-Agdeppa et al. 2019). This may be one of the reasons why according to the Department of Health, approximately 92.4% of Filipinos have dental caries and 97.1% of six-year-old children suffer from tooth decay. In fact, toothache is the most common reason for absence in school among schoolchildren in the Philippines (DOH 2017). These statistics are very alarming considering that dental caries is a largely preventable disease.

It is the primary caregivers, usually the mothers, who make decisions on purchasing and preparing foods for their children. However, good knowledge and attitude of parents may not necessarily translate to lower sugary foods and beverages consumption of their children. Presently, the available literature on the knowledge and attitude of primary caregivers on sugary foods and beverages and dental caries and the association to consumption by their preschool children remains unclear. The knowledge of mothers does not reflect on their decisions in making food choices. Instead, they feed their children based on their child's preferences, and the availability and cost of foods (Anjum et al. 2015). Literature also shows that the mothers' nutritional knowledge and attitude are positively correlated with their child's food intake (Al-Shookri et al. 2011).

As the sugar consumption and caries incidence of Filipino children remain high, there is a need to investigate the contributing factors so that early preventive measures can be taken. This study aimed to determine the knowledge and attitude of primary caregivers on sugary foods and beverages and dental caries and their association to the frequency of consumption by their preschool children. Part of the objectives of this study was also to determine the association between the demographic profile of the primary caregivers and their knowledge, attitude, and practices (KAP). Moreover, this study would be able to provide data in the Philippine setting since there is limited locally published data.

MATERIALS AND METHODS

This is an analytical cross-sectional study. Primary caregivers of preschool children enrolled at the Philippine Christian University Kiddie Kollege Manila for A.Y. 2018-2019 who gave their consent were included in the study. They must be Filipino and of legal age (i.e., 18 years old and above). The primary caregivers of children in the special education (SPED) class and those who did not give their consent were excluded. Total enumeration was done to include the primary caregivers of all 89 preschool children.

The school implements a half-day schedule for their preschool program where the students attend school for only three hours per day (8:00 am – 11:00 am or 12:00 nn – 3:00 pm). The school also follows the Policy and Guidelines on Healthy Food and Beverage Choices in Schools and in DepEd Offices (DO 13, s. 2017). This means that the school canteen does not sell sugary foods and beverages such as soft drinks and candies. However, this guideline only applies inside the school premises. The type of foods and drinks consumed outside by the children depends on the discretion of their primary caregivers. The feeding practices outside of school can be determined by the data gathered from this study.

A self-administered questionnaire was used to collect data for the knowledge and attitude of the primary caregivers, while a self-reported Food Frequency Questionnaire (FFQ) was used to assess practice (i.e., the frequency of sugary foods and beverages consumption of the preschool children). Practice was assessed using an 8-item Food Frequency Questionnaire (FFQ) which asked about the frequency of sugary foods and beverages consumption of the preschool children in a usual week. They were asked to choose among the following options: "more than once a day", "once a day", "5-6x per week", "2-4x per week", "once per week", or "less than once per week". Among the food items listed were commonly eaten snack foods such as candy, ice cream, chocolate, cakes/cookies, soft drink, milk, chocolate drink, and fruit drink. The FFQ used was adapted and modified from a study by Yabao et al. (2005) which determined the prevalence of dental caries and sugar consumption among schoolchildren in Benguet, Philippines.

Scores were assigned based on the number of correct answers. The knowledge, attitude, and practices of the primary caregivers were then divided into three categories (Table 1). The questionnaires included versions in both English and Filipino to cater to the language preference of the participants. All the questions used were adapted from previous related studies which used validated questionnaires. These were pre-tested to further suit the objectives of this study and the appropriateness to the Philippine context.

Table 1: Scoring system for knowledge, attitude, and practices

	Score
Knowledge	
Low	0-3
Moderate	4-6
High	7-10
Attitude	
Poor	0-2
Fair	3-5
Good	6-7
Practice	
High frequency	1-16
Moderate frequency	17-32
Low frequency	33-48

The questionnaire and informed consent form were placed inside an envelope and stapled inside the students' reminders notebook. This reminders notebook is the means of communication of the teachers to the parents. A note emphasizing the voluntary nature of the participation, the instructions on who shall answer the forms, and the directions on how and when the envelopes should be submitted were also attached. In this study, the primary caregiver refers to the person who mainly takes care and feeds the child. They are the ones who would know the actual sugary foods and beverages consumption of their child. This person may be the child's mother, father, grandparent, *yaya*, or other responsible person identified in the household. Announcements from the teachers regarding the study were also done to ensure a higher response rate.

A duly signed informed consent form was obtained from the primary caregivers who were willing to take part in the study. Verbal assent was also obtained from the students to indicate their willingness to participate. Throughout the entire process, it was emphasized to both the primary caregivers and students that participation in the study was completely voluntary, confidential, and would not affect their students' academic standing in any way.

The primary caregivers who participated in the study answered the form, put it back inside the envelope, and returned it inside their student's reminders notebook. These envelopes were then placed inside secure, locked drop box located inside each classroom. The contents of the drop boxes were collected by the primary investigator at the end of every day for the duration of

the data collection. Initially, the data collection lasted for a week; however, it was extended for another week to give more time and opportunity for the primary caregivers to participate.

Descriptive statistics were used to describe the demographics of the primary caregivers. Counts and percentages were used for the categorical variables (relationship with the child, sex, educational attainment, socioeconomic status), while mean and standard deviation were used for the continuous variable (age). Fisher's exact test and t-test were used to assess the association between the variables.

The study was approved by the University of the Philippines Manila Research Ethics Board (UPMREB).

RESULTS AND DISCUSSION

Demographic profile of the primary caregivers

A total of forty-six out of eighty-nine (51.69%) primary caregivers participated in the study. The mean age of the participants was 35.65 ± 5.36 years. Majority of the respondents were mothers (95.65%), while the other respondents were fathers. This is in accordance with several studies which regard parents, particularly mothers, as primary figures in their children's life (Anjum et al.2015; Adeniyi et al. 2009; Kamolmatyakul 2012; Niraj and Nuvvula 2015). The respondents were evenly distributed between the first and fifth income decile (average annual family income of ₱218,000 and below) and the sixth to tenth income decile (average annual family income of ₱218,001 and above); 73.91% of the respondents had a college degree or higher. Table 2 summarizes the demographic profile of the participants.

Table 2: Distribution of the primary caregivers according to their demographic profile

Age (years, mean ± SD)	
Age	35.65 ± 5.36
Sex, n (%)	
Male	2 (4.35)
Female	44 (95.65)
Relationship with the child, n (%)	
Mother	44 (95.65)
Father	2 (4.35)
Grandparent	-
Yaya	-
Socioeconomic status, n (%)	
₱218,000 and below	23 (50.00)
₱218,001 and above	23 (50.00)
Educational attainment, n (%)	
College undergraduate and high school graduate	12 (26.09)
College graduate and above	34 (73.91)

Knowledge and demographic profile

Approximately 56.52% of the participants had high knowledge, 43.48% had moderate knowledge, and none was categorized to have low knowledge on the association of sugary foods and beverages to dental caries. No significant association was found between the knowledge and demographic profile of the primary caregivers (age, sex, relationship with the child, socioeconomic status, and educational attainment).

These results are in disagreement with the study by Jain et al. (2014) where they found that majority of mothers (60.4%) had poor knowledge. The same study also found an association between knowledge, socioeconomic status, and educational attainment. The difference in results may be due to the other different sources of information that may affect level of knowledge such as books, television, social media, family, and friends. This may also be attributed to the high percentage of the primary caregivers who have a tertiary level of education.

Among the questions on knowledge, the relationship between frequent snacking and dental caries was the least known. Majority also either disagreed with or did not know that the consumption of sugar-rich foods at mealtime rather than when taken alone decreases the risk of dental caries. This suggests inadequate knowledge on the relationship between dental caries and the frequency and timing of consuming sugary foods and beverages.

Attitude and demographic profile

About 82.61% of the respondents had good attitude on oral health, 17.39% had fair attitude, and none was categorized to have poor attitude on the association of sugary foods and beverages to dental caries. In this study, attitude was defined as the beliefs which predispose the participants to feed their child in a certain way. Attitude may be influenced by cultural beliefs and social norms of Filipinos. This may influence the feeding practices of the primary caregivers.

The association between the attitude and demographic profile was not statistically significant. Abiola Adeniyi et al. (2009) and Ashkanani and Al-Sane (2012) had similar results; however, Jain et al (2014) found a significant association between attitude and age, socioeconomic status, and educational qualification. The inconsistencies in the results may be due to other factors that may affect attitude. Attitude is complex, multifactorial, and reflects our overall evaluation of matters. While demographics may affect attitude, Haddock and Maio (2005) believe that attitude is based on affective, cognitive, and behavioral information. This means that other factors such as feelings, beliefs, and past experiences influence attitude.

Practice and demographic profile

Most of the preschool children (84.78%) had low frequency of sugary foods and beverages consumption, 15.22% had moderate frequency of consumption, and none was categorized to have a high frequency of consumption. The most frequently consumed was milk, where 56.5% consumed it more than once a day. Meanwhile, ice cream and soft drink were found to be the least frequently consumed with 60.9% and 45.7% consuming them less than once per week, respectively.

The low frequency of sugary foods and beverages consumption of the children may possibly have been influenced by the generally good knowledge and attitude of their primary caregivers. The implementation of policies and taxations such as the Policy and Guidelines on Healthy Food and Beverage Choices in Schools and in DepEd Offices (DO 13, s. 2017) and the Tax Reform for Acceleration and Inclusion (TRAIN) law may also have affected the purchasing and consumption habits of the study population.

The association between the consumption practice of the children and the demographic profile of the primary caregivers was not statistically significant. On the contrary, a systematic review by Mazarello Paes et al. (2015) found that parents with lower socioeconomic status, lower education, and younger age had children with higher consumption of sugar-sweetened beverage (SSB). SSB consumption was found to be affected by individual, interpersonal, and environmental determinants. Aside from demographic factors, accessibility, permissiveness, and availability were also found to affect parenting practices (De Coen et al. 2012).

Association between knowledge and practice

The association between the knowledge of primary caregivers and the sugary foods and beverages consumption practice of the children was not statistically significant (Table 3). This shows that even though parents might know the importance of low

Table 3: Association between the knowledge of the primary caregivers and the foods and beverages consumption practice of the children

	Low Knowledge, n (%)	Moderate Knowledge, n (%)	High Knowledge, n (%)	p-value
Practice				>0.999
High frequency	-	-	-	
Moderate frequency	-	3 (6.52)	4 (8.69)	
Low frequency	-	17 (36.96)	22 (47.83)	

Table 4: Association between the attitude of the primary caregivers and sugary foods and beverages consumption practice of their children

	Poor attitude, n (%)	Fair attitude, n (%)	Good attitude, n (%)	p-value
Practice				0.325
High frequency	-	-	-	
Moderate frequency	-	0 (0.00)	7 (15.22)	
Low frequency	-	8 (17.39)	31 (67.39)	

sugar consumption and healthy diet, other factors may influence their choice. This suggests that improving practice, particularly less consumption of sugary foods and beverages, may take more than simply increasing knowledge and that oral health education programs may not necessarily result in less sugar consumption.

Angeles-Agdeppa found that Filipinos consume excessive amounts of sugar due to the high cost and unavailability of fruits and vegetables. However, in this study, most of the children had a low frequency of sugary foods consumption. Despite not being statistically significant, the good knowledge of most of the primary caregivers may have played a role in this. The association between the good knowledge and practice of the participants may have been influenced by the fact that majority of them had a college degree. This, however, may not hold true for the rest of the Filipino population where there may be significant differences in education and income. According to the Department of Science and Technology - Food and Nutrition Research Institute (DOST-FNRI), most household heads in the Philippines were high school graduates (21.9%) and only 9.7% graduated from college (DOST-FNRI 2016). This is quite a significant difference from the educational attainment of the respondents of this study, which may be a reason for the difference in data. Thus, simply educating parents may have a limited effect and addressing problems concerning purchase and preparation may have a more significant impact (Noble et al. 2007).

Association between attitude and practice

Although not statistically significant, more of those who had children with low frequency of consumption had good attitude (Table 4). Ashkanani and Al-Sane (2012), however, found that a positive attitude had x a strong association with good practice. The difference in results may be due to the complexity of the relationship between attitude and behavior. The Theory of Reasoned Action and the Theory of Planned Behavior postulate that attitude does not directly affect behavior because of behavioral intention and perceived behavioral control (Guyer and Fabrigar 2015).

Environmental, social, and economic factors may also have an influence in putting knowledge and attitude into practice. The World Health Organization stated that middle-income countries have high levels of sugar consumption and thus have high prevalence of dental caries (WHO 2017). This may be applicable to the Philippines, which is considered to be a lower middle-income country by the World Bank (2021). In addition, 40% of households in the Philippines belonged to the poor and poorest wealth quintile according to the 2015 Philippine Nutrition Facts and Figures done by the DOST-FNRI (2016b). Only a total of 7.9% of children 12-71 months old were able to go for a dental check-up while more children in richer wealth quintile groups were able to visit a dentist. The population groups with low socioeconomic status have a higher prevalence of dental caries. The increase in availability and access to sugary foods and beverages without appropriate preventive oral health care measures will lead to a subsequent increase in dental caries (WHO 2017). Understanding factors such as these which may affect KAP must be taken into consideration.

CONCLUSION AND RECOMMENDATIONS

No significant association was found between the demographic profile and knowledge, attitude, and practices (KAP) of the primary caregivers on sugary foods and beverages and dental caries and the frequency of consumption by their preschool children. The knowledge and attitude of primary caregivers also had a weak association to their practice (i.e., the preschool children's frequency of sugary foods and beverages consumption). This, however, may be due to the limited sample size and distribution where majority of the respondents were mothers. Nonetheless, this study provides an insight on the knowledge and attitude of the primary caregivers on sugary foods and beverages and dental caries and their association to the frequency of consumption by their preschool children.

For future studies, a larger sample size with a more even distribution of participants based on demographic profile is recommended to see the association between the different variables more clearly and to further validate the results of this

study. Primary caregivers with different social, professional, economic, and educational backgrounds would provide a more diverse sample and may lead to more information. Conducting the study in different settings, such as in public and private schools, and comparing the data gathered may also provide additional insights.

In addition, the Food Frequency Questionnaire (FFQ) could be modified and customized specifically for the study site and population by obtaining information on the usual diet of the children prior to data collection. Other data collection tools such as a food diary may be utilized to supplement the FFQ to get a more definite representation of the sugar consumption of the preschool children. The investigation of other factors such as access to foods, oral hygiene practices, and caries prevalence could also provide additional data for a more comprehensive study.

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CONFLICT OF INTEREST

All authors have no conflict of interest.

CONTRIBUTIONS OF INDIVIDUAL AUTHORS

JKO Go is the principal author and contributed to the conceptualization of research, acquisition and analysis of data, drafting and revising, and final approval of the manuscriptto be published. MAF Mendoza contributed to the conceptualization of research, acquisition and analysis of data, drafting and revising, and final approval of the manuscript to be published. The latter is also the overall advisor of the study. Both authors agree to be accountable for all aspects of the work. All authors declare that the manuscript's data, figures, graphs, calculations, etc. are authentic.

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