

# Predictors of Knowledge, Attitude and Practice of Mothers with Under 5 Years Malnourished Children in Kiribati

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## Research

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# Abstract

**Background:** Malnutrition among under 5 years old children is a common public health issue in both developed and developing countries. As mothers are the key persons responsible for their young children, this study aimed to assess the levels and predictors of knowledge, attitude and practice (KAP) of mothers of malnourished children less than 5 years old on South Tarawa, Kiribati.

**Methods:** This study is a cross sectional prospective design. This study conducted in pediatric ward and public health clinics of 11 public health centers on South Tarawa in Kiribati and among 82 mothers with under 5 years old malnourished children who were admitted to the Pediatric ward and public health clinics. The knowledge, attitude and practice on breastfeeding, weaning, diet and immunization was collected using a self-administrated validated questionnaire. Bivariate correlation and linear regression were applied and the significance level for this study was 5%.

**Results:** Majority of the mothers (66%) were 19-32 years old, 69.5% were Roman Catholics, 67% had attended high-school, 46% had husbands as breadwinners and 85% were married. The participants had a low level of knowledge and middle level of attitude and practice on breastfeeding, weaning, diet and immunization. Education level ( $r=0.319$ ,  $p=0.004$ ) and breadwinner at home ( $r=-0.239$ ,  $p=0.031$ ) were positively correlated with attitude. The results of linear regression were significant,  $F(2, 81) = 6.757$ ,  $p=0.002$ ,  $r^2 = 0.146$ , suggesting that education level and breadwinner accounted for 15% of the variance in attitude score.

**Conclusion:** This study showed the importance of mothers' attitude towards malnutrition. Encouraging female education could be a potential target for future policies to reduce malnutrition in Kiribati.

## Introduction

Malnutrition among under 5 years old children is a common public health issue in both developed and developing countries [1, 2]. In developing countries, children are 8 times more likely to die before reaching 5 years of age compared to children in developed countries. Each year more than 2 million children die as an outcome of undernutrition before the age of 5 years, especially in low and middle income countries [3]. Malnutrition can affect children in many ways such as: increasing susceptibility to infection, decreasing child development, raising mortality rate and individuals will function in insufficient ways [2, 4, 5]. In 2014, 1 in 4 children (156 million) was estimated to be affected by stunting, and 1 in 7 (93 million) is underweight [3]. For example; in the Pacific Island Countries (PICs), Papua New Guinea (PNG) had a "very high" rate of chronic undernutrition with 40% and Solomon categorized as "high" rate with 30%-39%, as per the World Health Organization (WHO) classification [6].

In 2013, Kiribati had 11,000 under 5 years old children approximately 14% of the total population and 6,934 of children aged 0–4 were living in South Tarawa alone [7]. Kiribati faces challenges to promote its people's health care as malnutrition and diarrhea remain major problems [8]. The results of a health survey in Kiribati showed that 23% of children are underweight or severely underweight [9]. This number

placed Kiribati above the WHO threshold (10%), making the prevalence of underweight children a major public health problem [10]. It was reported that Kiribati contributed to 28% of all under 5 deaths worldwide of which 15% were severely malnourished [11]. More children are underweight amongst the poorer families than in richer ones [12, 13]. Therefore, it is essential for the decision makers to detect malnutrition at an early stage for developing health promotion interventions at the community level. Inadequate accessibility and affordability of nutritious foods play a major role on both adult and childhood malnutrition [14, 15].

World Food Program (WFP) revealed that malnutrition has numerous causes, besides lack of access to food and nutrition [16, 17]. Therefore, to prevent and treat it properly, one needs a broad range of treatment methods and other variables, such as access to basic health services and better feeding practices. Mothers, as the primary caretakers to young children, need to be knowledgeable in looking after their children, especially earlier in life and also must have proper attitude and practice towards child-care in terms of nutrition especially. The Kiribati National Statistical Office (KNSO), claims that poor nutrition of children is linked to lack of breastfeeding, poor weaning practices, diet and morbidity, which is further exacerbated with the high rate of infectious diseases [18].

Essential health promotion interventions to improve child health and nutritional status is mostly focused on the mother behavior [19, 20]. Since a mother's care begins at home, interventions on behavior should begin in the home. As mothers are the key persons responsible for their young children, it is required to establish their level of Knowledge, Attitude, and Practice (KAP) on breastfeeding, complementary feeding, dietary practice and immunization in children and identify significant factors that affect their KAP. Consequently, this study aimed to examine the predictors of KAP of mothers of children under 5 years old, who suffer from malnutrition on South Tarawa, Kiribati in 2016.

## Methods

A descriptive cross-sectional study was conducted for eight weeks from the 21st of December 2015 to the 12th of February 2016 at 11 different public health clinics on South Tarawa, the capital island of Kiribati. The inclusion criteria were all I-Kiribati women with children under 5 years old who were identified as being malnourished (registered under the public health clinics). The exclusion criteria were mothers who were not willing to participate in the study and had critically ill children. This study recruited participants by purposive sampling. In total, there were 120 malnourished children under 5 years old registered from the public health clinics, however, only 82 participants were available for this study.

A self-administered questionnaire was used to collect data which was structured in 4 parts - socio-demographic questions and KAP related questions. The knowledge score was out of 12 questions, with a minimum score of 0 and maximum score of 12. The scores, with their respective knowledge levels, were 12–9 as high knowledge, 8–6 as medium knowledge and 5–0 as low knowledge. The attitude was assessed by 20 questions using a Likert scale ranged from positive to negative responses such as: strongly agree, agree, neutral (neither agree nor disagree), disagree and strongly disagree. The scoring

system used with respect to participant's responses to positive items was as follows: strongly agree scored 4, agree scored 3, neutral scored 2, disagree scored 1 and strongly disagree scored 0. For the negative statements strongly disagree scored 5 and coming down to 1 for strongly agree. The total score obtained for respondents was a maximum of 80 with a minimum of 0. Combined scores less than 40 were categorized as low level attitude, from 40 to 60 as middle level attitude, and above 60 as high level attitude. The practice score was out of 19 questions. The correct answer was given a 1 and a wrong answer was given a 0. The total points to be scored was 19 and the minimum was 0. As a result, the score with their respective practice levels, were as follows; 19–13 was high practice, 12–9 was medium practice and 8–0 was low practice [21, 22].

A pilot test on the questionnaire was carried out at the Bikenibeu West public health clinic and Pediatric ward to test its face validity and effectiveness on 10 participants, of which 5 were mothers from the hospital while the other 5 were mothers from the public health side of the hospital. Content validity was done by 3 academic experts to support with their opinions. The Cronbach alpha score was 0.78.

The mothers who met the study inclusion criteria were informed about the study using an information sheet. If they volunteered to take part in the interviews they were asked to sign the consent form. The questionnaires, information sheets and consent forms had 2 versions, both in Kiribati and English language. Cross translation was carried out (English to Kiribati language and then Kiribati to English language) by bilingual translators to ensure the questions were clearly understandable to the participants. The questionnaire was carried out by the researcher for those mothers that were unable to read in English or Kiribati language and illiterate mothers, questionnaires were given to them to fill in and then returned to the researcher on the same day.

All responses from questionnaires were first entered into Microsoft Excel and then exported to SPSS Version 22 for data cleaning and analysis. For data analysis, descriptive analysis was used to determine the frequency of responses and displayed in tables and graphs by percentage distribution. Multiple linear regression was conducted on variables that predict the KAP score. Significant values (alpha value) were performed to prove or disprove any null hypothesis (if there is one) and a p-value of less than 0.05 was considered significant.

This study was conducted according to the guidelines laid down in the Declaration of Helsinki and all procedures involving research study participants were approved by the Fiji National University's College Health Research Ethics Committee (CHREC) and Kiribati Ministry of Health. Written informed consent was obtained from all subjects who were 18 and over and those who were under 18 years. Those who were under 18 years old were provided consent forms to obtain parental consent and were also requested to sign the assent form for participation in the study.

## **Results**

### **Sociodemographic characteristics**

Two thirds of the women in the study were between 19–32 years of age, the highest percentage of mothers were Roman Catholic (69.5%), 85% were married, 67% had high school level of education and 46% had breadwinners as husbands (Table 1).

Table 1  
Sociodemographic status of respondent

<b>Demographic Status (n = 82)</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Age</b>		
< 18 years	2	2.4
19–25 years	27	32.9
26–32 years	27	32.9
33–39 years	19	23.2
> 40 + years	7	8.5
<b>Religion</b>		
Bahai	1	1.2
Kiribati United Church	15	18.3
Latter Days Saints	2	2.4
Seventh Day Adventist	2	2.4
Roman Catholic	57	69.5
Others	5	6.1
<b>Marital Status</b>		
Married	70	85.4
Divorced	1	1.2
Separated	1	1.2
Single	6	7.3
Widowed	4	4.9
<b>Education level</b>		
Graduate school	2	2.4
High school	55	67.1
Primary school	24	29.3
No education	1	1.2
<b>Breadwinner</b>		
Husband	38	46.3
parents	12	14.6

Demographic Status (n = 82)	Frequency	Percentage
sister/brothers	8	9.8
son/daughter	1	1.2
None	18	22.0
Others	5	6.1

## Levels of KAP

The mean knowledge score was 5.43 ( $\pm$  1.39) which shows that mothers had a low level of knowledge. The mean attitude score was 54.17 ( $\pm$  4.78) which shows that mothers had a middle level of attitude. The mean practice score was 9.83 ( $\pm$  2.21) which shows that mothers had a middle level practice on breastfeeding, weaning, diet and immunization.

Table 2  
Mean and SD of KAP

Item	Mean	SD
Knowledge	5.43	1.39
Attitude	54.17	4.78
Practice	9.83	2.21

## Predictors of KAP

Table 3 shows the correlation coefficient (r) between demographic variables and KAP using correlation test. Education level ( $r = 0.319$ ;  $p = 0.004$ ) and Breadwinner at home ( $r = -0.239$ ;  $p = 0.031$ ) was positively correlated with attitude scores.

Table 3  
Results of correlation test of mother's demographic status with knowledge, attitude and practice

Variables	Knowledge		Attitude		Practice	
	r	P-value	r	P-value	R	P-value
Age	-0.061	0.589	-0.027	0.812	0.102	0.362
Religion	0.005	0.967	0.147	0.186	0.083	0.458
Marital status	-0.078	0.485	-0.193	0.083	-0.115	0.305
Education level	-0.023	0.834	0.319	0.004**	0.158	0.156
Breadwinner	-0.114	0.307	-0.239*	0.031*	-0.125	0.263

The result of multiple linear regression was significant,  $F(2, 81) = 6.757$ ,  $p = 0.002$ ,  $r^2 = 0.146$ , suggesting that education level and breadwinner accounted for 15% of the variance in attitude score. As Table 4 describes, education level and breadwinner were significant predictors of attitude,  $\beta = 2.3$ ,  $p < 0.005$ ;  $\beta = -0.4$ ,  $p < 0.05$ , suggesting that mothers who graduated from school were 2.3 times more likely to have an increased attitude score compared to mothers with no formal school. Mothers with no breadwinner at home were 0.4 times more likely to have a decreased attitude score compared to mothers that have breadwinners at home.

Table 4  
Results for Multiple Linear Regression with Education Level and Breadwinner predicting Attitude score

Variables	B	P-value	95% CI	
Education level	2.336	0.005	0.717	3.995
Breadwinner	-0.407	0.046	-0.807	-0.008

## Discussion

In this study, mothers of malnourished children less than 5 years had a low level of knowledge and a medium level of attitude and practice in regard to breastfeeding, complementary feeding, dietary practice and immunization. Education level and having a breadwinner at home are the 2 variables that correlated with attitude of the participants.

The level of mothers' knowledge might be affected by the socioeconomic status of the individual including their education level, if there is a breadwinner at home and employment status [23]. According to this study, the highest percentages of mothers were high school level educated mothers and breadwinners at home were husbands, while 22% had no breadwinner at home. As reported in a study by

Frost, Forste and Haas, socioeconomic status is the most important pathway linking maternal education and child nutritional status [24]. "A low level of maternal education and a lack of knowledge on good childcare practices means children do not receive optimal nutrition and care" [25].

In this study, mother's attitude showed a medium level of attitude with a mean score of 54.17, SD =  $\pm$  4.78. Mother's attitude showed the majority of them had neutral ideas or do not know that colostrum is best for the child and the best time to initiate breastfeeding is soon after birth. As recommended by the WHO, breastfeeding should be initiated 1 hour after birth and ensures that the infant receives the colostrum or "first milk" which is rich in protective factors [26].

Mothers should have a good basic perspective on cooking lessons, carried out in the community during child health care visits, so that they could gain proper approaches on how to make a healthy and balanced diet for their children. If mothers had neutral ideas about a balanced diet, then the food they provided to their children was not healthy, which then leads to malnutrition. Therefore, health talk by nurses or health professionals is needed at the community level, especially for mothers on healthy foods at home, or to run a workshop that they could attend and could motivate and change the way of thinking towards a balanced diet for their children.

To change people's attitudes, persuasion is one of the most common types of communication. Its' success depends on the source, the communicator and the message. In order to understand why people would attempt to understand, remember and accept persuasive messages, it is necessary to study the characteristics of the person presenting the message, the content of the message and the characteristics of the receiver of the message [27]. The three simple goals of risks communication such as sharing information, change beliefs and change behavior need to be applied to flow the communication well to the other person to be effective [28].

Mother's attitude had 2 significant predictors: mother's education level  $\beta = (2.3, p < .005)$  and having a breadwinner at home ( $\beta = -0.4, p < 0.05$ ). This study showed that mothers who graduated from school were 2.3 times more likely to have increased attitude scores compared to mothers with no school. Mothers without a breadwinner at home were 0.4 times more likely to have decreased attitude scores compared to mothers which have a breadwinner at home.

Similarly, in another study by Abuya, Onsomu, Kimani and Moore, there was an association between mother's attitude and maternal education. They explained that children born to mothers with only a primary education were 2.17 times more likely to be fully immunized compared to those whose mothers lacked any formal education ( $p < 0.001$ ) [29]. A similar study was conducted by Molcho, Kelly & Gabhain, among 10,334 school children, enrolled from 215 schools in Ireland, found that positive perceptions towards school and local area increased the chance of reporting excellent health seen in both immigrant groups ( $p < 0001$ ) [30]. Nutritional education of mothers shows a negative relationship with malnutrition of children specifying that the better the dietary health awareness of the mothers the lesser the child's malnutrition [31].

Practice of mothers in this study showed a medium level of practice with a mean score of 9.83, SD = ± 2.21. Nutrition is crucial and a generally recognized factor in the child's right to the enjoyment of the highest achievable standard of health, as stated in the Convention on the Rights of the Child (CRC) [25]. Children have the right to adequate nutrition and access to safe and nutritious food, and both are essential for fulfilling their right to the highest attainable standard of health. Women, in turn, have the right to proper nutrition, to decide how to feed their children, and to full information and appropriate conditions that will enable them to carry out their decisions. These rights are not yet realized in many settings [32].

Mothers play a major role in their child's lives and it is their responsibility to fulfill and give the best to their child, according to the CRC, not only in concern to their child but for themselves, as well as to have the full potential and capability to carry out their duties for their children in everyday lives.

According to Kimani-Murage et al., a mother's ability to feed have been linked with maternal nutritional knowledge [33]. Therefore, caregivers such as mothers, should also be educated not only on the adequacy of food but also the way they prepare food including: a safe manner to minimize risk of contamination, giving appropriate ways that foods are the proper texture for the age of the child and applying responsive feeding.

According to the causal model of malnutrition adopted by the United Nations Children's Fund (UNICEF), was stated that the immediate cause of malnutrition are inadequate dietary intake and disease [34]. This study showed that inadequate dietary intake is the only immediate cause of malnutrition in their study setting, as disease was not included in this study. As stated by the Department of Foreign Affairs and Trade in Kiribati, economic and environmental status is linked with malnutrition [11]. South Tarawa, where the survey was conducted among mothers of undernourished children, is a largely populated center and lived differently than people from outer islands. South Tarawa has the second highest poverty incidence of 17% of households [18]. In 2006 the basic poverty line was 22% and in 2010 was 66%. A typical household in South Tarawa has a big family, 1 or 2 members earning a salary, more likely to have health issues from poor water, sanitation and overcrowding and have limited access to land [15]. Thus these determinants of health have an impact on the current problem of malnutrition in Kiribati and hence need a more streamlined approach to tackle it strategically rather than opting for short-term solutions.

This is the first study conducted in Kiribati using a validated questionnaire. All mothers with malnourished children from different locations were included in this study. There are several limitations to this study. The small sample size was not representative of the population. This study was a cross sectional study so that the results of this study can't be generalized to all population. Data was collected during working hours and was disrupted more with staff entering the room.

## Conclusion

From the study, it is seen mothers had a low level of knowledge with a medium level of attitude and practice towards breastfeeding, complementary feeding, dietary practice and immunization. There were 2

variables found to be significantly correlated with attitude: education level of mother and the breadwinner at home. It is confirmed from this study that in order to efficiently and effectively decrease the incidence of malnutrition among children residing on South Tarawa, mother's knowledge need to be enhanced, attitudes need to be changed, as well as developing practices to have a very clear role and understanding on breastfeeding, weaning, dietary and immunization. This could be fulfilled with the assistance from health professionals, the ministry of health, community and different stakeholders for a bright future for the young generation of Kiribati who are the future assets of tomorrow. The policy needs to address the maternal education aspect particularly since this is one of the critical components of attacking malnutrition.

Malnutrition is a result of the environment, socioeconomic status, and culture that surrounds the caretakers. Basic nutrition education helps caretakers make more informed dietary decisions within their households to improve the nutritional status of their children. This study provides information essential to enhanced decision making, health care delivery planning and has policy implications for the improvement of quality of health care in the province.

## **Abbreviations**

CRC: Convention on the Rights of the Child; KAP: Knowledge, Attitude and Practice; KNSO; Kiribati National Statistical Office; PICs: Pacific Island Countries; PNG: Papua New Guinea; UNICEF: United Nations Children's Fund; WFP: World Food Program; WHO: World Health Organization.

## **Declarations**

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### **Authors' contributions**

All authors took part in the design of the study. Research proposal was guided by MM. The data was collected and analysed by AR and revised by MM and N.S.A. All authors participated in the preparation and approved the final manuscript for publication.

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### **Availability of data and materials**

The datasets generated and analysed during the current study are not publicly available due to institutional requirements but are available from the corresponding author on reasonable request.

### **Ethics approval and consent to participate**

This study was approved by the Fiji National University's College Health Research Ethics Committee (CHREC) and Kiribati Ministry of Health. Written informed consent was obtained from all subjects who were 18 and over and those who were under 18 years. Those who were under 18 years old were provided consent forms to obtain parental consent and were also requested to sign the assent form for participation in the study.

### **Consent for publication**

Not applicable.

### **Competing interests**

The authors declare that they have no competing interests.

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