Mother's Health Awareness and Nutritional Status of Children in Khartoum State-Sudan

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ABSTRACT

The main objectives of the study are to investigate the relation between socioeconomic factors and mother's health awareness, and the impact of mother's awareness on her children's health.

Comparative approach was made between three different socioeconomic strata. Sample size was 400 families, the main respondent was mother. Different quantitative and qualitative methods of data collection were used (questionnaires, interviews, focus groups, and observations). Likert scale was also used to measure mothers' awareness. Anthropometric measurement and prevalence of diseases of under –ten years old children were both used to determine children health status. The study found that family income was the strongest factor affecting mother's health awareness (P=0.000), also mother's education and age are influencing factors. Accordingly, the children of the first class area were found to be healthier than the two other areas; the mean Z-score is (0.01). Moreover, mother's health awareness leads to decrease the prevalence of malaria and pneumonia. Therefore, intervention health awareness programmes towards mothers are needed to improve children's health (e.g. nutrition, personal hygiene and home sanitation). The government must also give more attention to the adoption of new policies for improving the general standard of living.

Key words: Nutrition status, health education, mother's awareness, infectious diseases.

INTRODUCTION

Family health is an essential matter. Mother plays a vital role concerning providing health care for her family. She bears the responsibility of taking care of her children's health needs and caring for older adults or sick relatives (1). She is also responsible for their foods, hygienic measures and health requirement. The mother is also responsible for upbringing healthy infants and children as she take the decision regarding their health and illness. Many studies have shown that the most important factors affecting family health are mothers education, age, economic status, her knowledge and attitudes towards preventive measurement, treatment of diseases and how to promote health (2-5).

Health status can be measured by morbidity and mortality rates. In 2011, WHO (6) reported that child mortality continues to decline worldwide. It was also reported that malnutrition among children remains common in many parts of the world. According to recent estimates, 115 million children under 5 years of age worldwide are underweight. Thus although the global prevalence is decreasing, progress is uneven. In Africa, the stagnation of prevalence coupled with population growth led to an increase in the number of underweight children from 24 million in 1990 to 30 million in 2010. In Sudan the nutritional status of children under five is very poor, thus, underweight during the period 1990-1999 was 31.8%, it decrease only to 31.7% during the period 2000-2009 (6).

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In Sudan some nutritional practices and taboos exacerbate children's health. For example, in western Sudan (Kordofan) people believe that eating of egg delays the child speaking (7). Another negative belief is that the milk of a pregnant mother is very harmful and leads to diarrhea and vomiting to breast feed infant, as a result, she immediately stops most of breast feeding.

Culturally, in Sudan the concept of nutritious foods is vague. Therefore, mother's knowledge about the appropriate foods for her family is very poor. Abdalla et al. (8) reported that nutritional education of mother is important to improve her qualifications and capabilities regarding taking care of her children. Poverty and insufficient income for the family is also found to be the main causes of nutritional anemia, which can adversely affect persons activities. Because low per capita income lead to deficiency in daily calories intake which lead to diseases and high death rate (9). This may lead to a negative economical development (10). Also, the means of preparation of foods is an important issue, as it can easily be contaminated by dirty surfaces and equipments (11).

Infectious diseases are the world's biggest killer of children and young adults. In Sudan malaria is number one public health problem. It is estimated that the most frequent cause of death from malaria was 5% and from pneumonia was 5% in 2007 (12). In Sudan, prevention relied heavily on vector control through insecticide spray, with minimum efforts toward early diagnosis and treatment. Bed nets have been in use for a long time. Federal Ministry of Health (12) reported that pneumonia represents the highest percentage (29.9%) among diseases leading to health units for children less than five years, and malaria represents the second disease (15.5%).

Many study found that pneumonia is associated with overcrowded places, malnutrition and poor environmental conditions (13,14). Generally the adequacy of health care services is important to control the spread of all diseases. However, the access to health care units is sometimes depends on the economical status of the patient.

The main objectives of the study are to investigate the relation between socioeconomic factors (age, education and family income) and mother's health awareness, and the impact of mother's awareness on her children's health.

MATERIALS AND METHODS

The study aims to investigate the relation between socio-economic factors (age, education and family income) and mother's health awareness, and the impact of mothers awareness on her children's health during 2011.

Site

This research was conducted in Khartoum State, which is located between latitudes 15°26' and 15°45' N and longitudes 32°25' and 32°40' E, at an altitude of 405.6 m above sea level. In the last census 2008 Khartoum total population was 5.7 million. Khartoum is a cosmopolitan area representing people from different social backgrounds. The study used a comparative approach between different socio-economical areas. Alriyad selected to represent the high socio-economical status (HSS), Gebra representing the middle socio-economical status (MSS), and Alremala representing the lower socio-economical status (LSS). The three areas have a good supply of the basic infrastructure. Which includes; water supply, electricity, garbage collection services, education and health services, and decent roads. There is inequality in the distribution of education and health services among the three areas.

Design

This was a cross-sectional study.

Sample

A multistage random stratified sampling technique was employed for the selection of the study population in this cross-sectional study. Research sample was 400 families. The stratums were distributed proportionally according to the size of the population in each area. At first 120 families was chosen from Alriyad the high socio-economical status (HSS) to represent about 6% from 2019 family (CBS, 2008). 180 families from Gebra the middle socio-economical status (MSS) studied to representing about 2% from 9352 families (CBS, 2008). In Alremala the lower socio-economical status (LSS), 100 families studied to represent about 6% from 1967 families (CBS, 2008). The unit of the study is the family, where the main respondent was the mother.

Data collection

Both quantitative and qualitative methods of data collection were used. Interviews guided by semi-structured questionnaires were used to collect data on socio-demographics. A pilot study was undertaken to test the reliability of the questionnaire,

Age/ Marriage age/ Education/ Income	Area				P value
	Alriyad	Gebra	Alremela	Total	
Age[a];					
≤ 40	48	98	45	191	
	40.0%	54.4%	45.0%	47.8%	0.04
≥ 41	72	82	55	209	
	60.0%	45.6%	55.0%	52.2%	
Marriage age[b]					
≤ 19	35	65	52	152	0.002
	29.2%	36.1%	52.0%	38.0%	
≥ 20	85	115	48	248	
	70.8%	63.9%	48.0%	62.0%	
Education[c];					
< university	34	114	74	222	0.000
	28.3%	63.3%	74.0%	55.5%	
≥ university	86	66	26	178	
	71.7%	36.7%	26.0%	44.5%	
Income[d];					
< 301$	5	168	95	268	0.000
	4.2%	93.3%	95.0%	67.0%	
> 300$	115	12	5	132	
	95.8%	6.7%	5.0%	33.0%	

TABLE 1: Demographic characteristics of mothers.

and was completed by (twenty-one mothers-seven from each area) and additional correction was made to reach the final form of questionnaire.

Questionnaire

A structured questionnaire was designed to fulfill the study objectives. It consisted of five sections: The first section was concerned with the personal and socio-demographic characteristics of the participants (e.g., age, sex, and education). The second section of questionnaire was about eeconomic status of household. The third section; Health status; vaccination, common diseases among children, different types of prevention and treatment etc. Mother's awareness is the fourth section, it focus on her attitudes towards some health indicators like prevention methods, personal hygiene, health foods, chemical fertilization, etc. The awareness and attitudes of mothers were measured by Likert scale. The last section is Anthropometric measurements of children under ten (sex, age, height and weight). The study selects randomly fifty children

less than ten years from each area, and the measurement were done by two nutritionists.

Data collection

Data were collected during 2011.

Statistical analysis

For the comparisons, the χ^2 test at 99% level of significance (p = 0.01) was used. Data were analyzed by the SPSS program (statistical package for social sciences), the results presented by percentage and chi-square test.

RESULTS

Socio-demographic of mothers

Table 1 shows the demographic characteristics of mothers in three areas. In Alriyad city (HSS), most of mothers belong to the age group ≥ 41 years (60%), while in Gebra (MSS) (45.4%) mothers and in Alremela (LSS) (55 %) of mothers belong to this age group.

In Alriyad only 29.2% mothers got married before they reached their 20th birthday and in Gebra 36.1% of the mothers married in age ≤19, whereas in Alremela the percentage significantly increase to reach 52% of mothers got married at the age of 19 or less. This reflects a strong association between age of marriage and economic class (p=0.002).

Concerning mother's education; in Alriyad up to 71.7% of mothers have either university or above level of education, whereas in Gebra and Alremela only 36.7% and 26% respectively of this level of education. It is clear that the education level significantly increase as the economic status increase (p=0.000).

Concerning family's monthly income; in Alriyad (HSS) only (4.2%) of families earn less than 301$, while in Gebra (MSS) and Alremela (LSS) up to 93.3% and 95% of families respectively earn monthly this amount of money (p=0.000).

Mother's awareness

Mother's awareness refers to personal knowledge, beliefs, and attitudes, etc, which is usually acquired through many ways such as education, interrelation with persons around, different types of media, and personal experiences, etc. It directs and determines mother's behavior and practices related to health and illness. Mother's awareness was measured by Likert scale, using various indicators related to health knowledge. Awareness was measured by various indicators related to health knowledge such as: Healthy food, preventive methods, home sanitation, personal hygiene, self medication and hygienic practices, etc. The study found that up to percentage 43% of mothers have middle level of awareness, 34% have either a high or very high levels of awareness and only 23% of mothers have lower levels of awareness. This shows comparatively a lower percentage of unaware mothers in the sample studied towards health issues. Many socioeconomic variables were also found to have a great influence on mother's awareness. As shown in Table 2 there is a strong significant (p=0.000) positive association between residential area and mother's health awareness. Thus up to 50% of the high class women from Alriyad (HSS) have either a high or a very high degree of awareness, whereas in Gebra (MSS) and Alremela (LSS) only 23.9% and 33% respectively have these degrees of health awareness.

TABLE 2: Mother's health awareness and residential area.

Mother's Awareness	Area			
Alriyad	Gebra	Alremela		
	HSS	MSS	LSS	Total
Very low	0	6	6	12
	0%	3.3%	6.0%	3.0%
Low	10	50	20	80
	8.3%	27.8%	20.0%	20.0%
Middle	50	81	41	172
	41.7%	45.0%	41.0%	43.0%
High	46	30	27	103
	38.3%	16.7%	27.0%	25.8%
Very high 14	13	6	33	
	11.7%	7.2%	6.0%	8.2%
Total	120	180	100	400
	100.0%	100.0%	100.0%	100.0%

Chi²-P=0.000   Source: fieldwork 2011

TABLE 3: Mother's health awareness and Family Income.

Income	Mother's awareness			
	Low awareness	Middle	High awareness	Total
< 301$	92	122	54	268
	34.3%	45.5%	20.1%	100.0%
> 300$	20	41	71	132
	15.2%	31.1%	53.8%	100.0%
Total	112	163	125	400
	28.0%	40.8%	31.2%	100.0%

Chi²-P=0.000   Source: fieldwork 2011

Table 2 shows that the percentages of mothers who have very high degree of awareness (11.7%) exist in Alriyad (HSS), and relatively the percentage decrease in low socioeconomic areas. On the other hand, no mother in Alriyad (HSS) have very low degree of awareness, and the percentage increase gradually to 3.3% and 6% in Gebra (MSS) and Alremela (LSS) respectively.

Table 3 shows that the percentage of mothers with high level of awareness (53.8%) is higher in family earn more than 300$ compared with (20.1%) mothers their families earn less than 301$. This reflects the strong influence of economic status on mothers health awareness (P=0.000).

TABLE 4: Mother's health awareness and education level.

Education level	Mother's awareness			Total
	Low awareness	Middle	High awareness	
Less than university	73	90	59	97
	32.9%	40.5%	26.6%	100.0%
University and above	39	73	66	178
	21.9%	41.0%	37.1%	100.0%
Total	112	163	125	400
	28.0%	40.8%	31.2%	100.0%

Chi²-P=0.021   Source: fieldwork 2011

Another possible reason which was previously observed was that the general level of education (mother, father and sons/daughters) increased among higher classes, which also affects positively mothers health awareness.

A direct positive association between the level of education and mothers health awareness was detected (p=0.021). The percentage of mothers with high level of awareness (37.1%) increase within mothers who attained university and above education level compared with (26.6%) mothers who have less than university level. Mother's education is widely recognized as an important factor in bringing healthier and better educated families. This study has also found a strong association between fathers, sons\ daughters education and the mothers health awareness (chi-square test p-values were p=0.006 and p=0.03 respectively).

Table 5 shows that there is a significant association between mother's age and her awareness. A high percentage (39.7%) of mothers with a high degree of awareness aged more than 40 years old, compared with 22% mothers less than 41 years old (P=0.001).

TABLE 5: Mother's health awareness and age.

Mother's age	Mother's awareness			Total
	Low awareness	Middle	High awareness	
< 41	59	90	42	191
	30.9%	47.1%	22.0%	100.0%
> 40	53	73	83	209
	25.4%	34.9%	39.7%	100.0%
Total	112	163	125	400
	28.0%	40.8%	31.2%	100.0%

Chi²-P=0.000   Source: fieldwork 2011

Income, age, education and high levels of health awareness influences were obvious in the improved health status of the under ten children. Children health was assessed through two variables: anthropometric measurements and the prevalence of two infectious diseases (malaria and pneumonia).

The relation between mother's awareness and anthropometric measurements

Mother's awareness, beliefs and attitudes related to health and illness are important and significant issues, because it directs and determines her behavior and health practices.

Table 6 shows that among the mothers who have a high degree of awareness up to 54.6% of their children enjoy a normal healthy weight, whereas the percentage degrease to 47.5% and 47% among those whose their mothers had middle and low level of health awareness respectively. It is clear that there is positive relation between mother's awareness and nutritional status of her children, but the difference is not statistically significant.

The relation between mother's awareness and prevalence of infectious diseases

Mother's perceptions and awareness relating to causation, diagnosis, treatment and prevention are the main socio-cultural factors which can influence malaria and pneumonia prevention and control.

Table 7 shows that among the mothers who have a high degree of awareness only 5.3% of their children infected by malaria, whereas the percentage increase to 8.8% of children their mothers have a low degree of awareness. It is clear the negative relation between mother's awareness and prevalence of malaria, but the difference is not statistically significant.

TABLE 6: Mother's awareness and anthropometric measurement.

Anthropometric measurement	Degree of awareness			Total
	Low awareness	Middle	High awareness	
Overweight	10	12	10	32
	25.0%	18.2%	22.7%	21.3%
Normal	19	31	24	74
	47.5%	47.0%	54.5%	49.3%
Malnourished	11	23	10	44
	27.5%	34.8%	22.7%	29.3%
Total	40	66	44	150
	100.0%	100.0%	100.0%	100.0%

Source: fieldwork 2011

Table 8 shows that among the mothers who have a high degree of awareness only 42.7% of their children infected by pneumonia, whereas the percentage increase to 57.4% of children their mothers have a low degree of awareness. According to chi square test it is apparent that there is a significant association (P=0.03) between mother's awareness and the prevalence of pneumonia. This might be due to that pneumonia is an infectious disease, and increased in unhealthy and poor environment.

DISCUSSION AND CONCLUSION

Mother's awareness, beliefs and attitudes related to health and illness are important and significant issue, because they directly affect her behavior and health practices. Generally, health awareness can be acquired through many ways; education, communication with persons around, through different types of media, personal experiences, etc. The study found that; income was the strongest influencing factor affecting positively mother's awareness (P=0.000). This might probably been attained through the availability of various sources of knowledge; education, multimedia, etc.

Moreover, mother's age is an important factor affecting her health practices (p=0.001). Mother's age affects personal experiences, however, good information about prevention and promotion of health can be obtains by simple ways. Moreover different media and other family members may have a great influence on their mother's awareness. It was noticed from interviews that some healthy knowledge obtained from husband or/and sons/daughters. It is worth to say that young mothers married before completing their education, which affecting by other way in their awareness.

TABLE 7: Mother's awareness and prevalence of malaria.

Malaria	Degree of awareness			Total
	Low awareness	Middle	High awareness	
Yes	6	10	4	20
	8.8% 8.5%	5.3%	7.7%	
No	62	107	71	240
	91.2%	91.5%	94.7%	92.3%
Total	68	117	75	260
	100.0%	100.0%	100.0%	100.0%

Source: fieldwork 2011

TABLE 8: Mother's awareness and prevalence of pneumonia.

Pneumonia	Degree of awareness			Total
	Low awareness	Middle	High awareness	
Yes	39	72	32	143
	57.4%	61.5%	42.7%	55.0%
No	29	45	43	117
	42.6%	38.5%	57.3%	45.0%
Total	68	117	75	260
	100.0%	100.0%	100.0%	100.0%

Chi²-P=0.03   Source: fieldwork 2011

A direct positive association between the level of education and mother's health awareness was detected (p=0.021). Education increases the knowledge about prevention methods; including hygienic behavior, improved home sanitation to fight insects and vectors carrying diseases.etc. This was confirmed by many studies such as that of Caldwell (2), who reported that mother's education is important for declining childrens mortality rate in Nigeria. The families members education (husband and sons/daughters) were found to have a strong influence on mothers health awareness, this agree with some studies such as Lindelow (3) and Helton et al (15).

From results family income and level of education increase in high class, this reflects in mothers health awareness. A direct positive association between residential areas and mother's health awareness was detected (p=0.000). This might be due to their high standards of living which allow them to better access to variety sources of knowledge like radio, television, books, the World Wide Web (internet), etc. This is reflected in their children health status. The study found that the children of the first class (Alriyads) are healthier than the other two areas. The study also found that there is strong relation between mother's awareness and their children nutritional status this agree with Abdalla et al. (8) study. Mother's knowledge and experiences about the appropriate foods for her family is very important, because it affects directly her family's health. It is well known that over weight and malnourished children is not healthy, but in Sudan there is a common belief among many mothers that obesity is positively associated with health and beauty. Some mothers consider fast meals, chocolates, and chips were nutritious foods, and were not aware about the importance of fruits and vegetables intake. These types of food increase weight but do not improve the nutritional status of children.

High awareness means good knowledge about disease prevention methods, selection of a proper ways of treatment and knows how to promote health. This reflected in the prevalence of malaria and pneumonia, the study found that there is a negative association between mothers awareness and the prevalence of these diseases. Although pneumonia is a major cause of death in Sudan, little is known about mothers beliefs and practices surrounding the disease. There are many causes lead to pneumonia prevalence, such as; poor socioeconomic status, malnutrition, late care seeking and inadequate treatment as maintained in previous studies (13,14). Moreover, the prevalence of malaria is usually associated with unhealthy environment of the area, which leads to a lot of mosquitoes. Therefore, mothers awareness about how to prevent this disease is important issue, and decreases the risk of malaria infection.

RECOMMENDATION

The study recommends that government must give more attention to mother's education, because it is the most important factor affecting overall health in Sudan. Though, health education of mothers is a key to prevented diseases and significant to improved health status of the whole family and be achieved. Economic status is also a strong factor affecting family's health. Therefore, the government must adopt policies to improve the standards of living in general.

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