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SOCIO-ECONOMIC STATUS AND HOUSEHOLD ENVIRONMENTAL FACTORS IN CHILDREN WITH ACUTE RESPIRATORY INFECTIONS IN MOGADISHU, SOMALIA

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Abstract: *: An estimated 3.9 million deaths of young children occur globally due to the Acute Respiratory Infections (ARI) which is preventable by using low-cost interventions such as hand washing, breastfeeding, and accessibility of rapid and attainable methods of early diagnosis. A cross-sectional study was conducted in selected hospitals of Mogadishu City in Somalia. A sample size of 140 respondents was used. Random sampling technique was applied for the selection of the study sample. Semi-structured questionnaire has been used as a tool for data collection. The majority of the respondents were aged between 15-45 years. The maximum number of the respondents were housewives with a family income of 100-300 USD. Most children were born with a normal birth weight more than or equal to 2500 grams. More than half of the participants, 88(62.85%), 30(21.42%), responded that their children were born with a low birth weight less than 2500 grams, and 22(15.71%) of the respondents were not sure about their childbirth weight. The prevalence of ARI is often associated with many socio-economic status and household environmental factors such as overcrowding, unemployment rates, and educational and housing quality, among other factors which increase the risk of ARI and should therefore be included in the strategies to reduce ARI incidence.*

Keywords: *: Acute Respiratory Infection, Household factors, Environment factors, Socio-economic status, Somalia*

Introduction

Globally, Acute respiratory tract infection (ARI) is a prime cause of morbidity and mortality in children under the age of 5 years which is considered as one of the major public health problems, and it is also a leading cause of morbidity and mortality in many developing countries1. Across the world, severe ARI causes more than 12 million hospital admissions. The prevalence of ARI was instituted to be higher in children with malnutrition.Compared to high income-countries, the low-and middle-income countries are facing a huge burden of higher levels of the incidence and prevalence of ARI. According to WHO, the yearly number of ARI-related deaths in children less than five years old (apart from death caused by measles, pertussis, and neonatal deaths) was about 2.1 million, i.e., about 20% of all childhood deaths.A study conducted in India, especially in the urban slums of Gulbarga city, shows that chronic illnesses like deafness, breathing difficulty, and their subsequent disability among children, owe their origin to inadequately treated episodes of ARI5. It also displayed that in developing countries, close to 50% of all deaths in the community are among under-five the age group children (WHO comprise 13% of the general population).

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The lower respiratory tract covers the continuation of the airways from the trachea and bronchi to the bronchioles and the alveoli[2]. The most common organisms known to cause ARI among children include bacteria such as Staphylococcus aureus, Streptococcus pyogenes, Pneumococci, Haemophilus influenzae & Klebsiella pneumonia. Viruses such as Adeno, Rhino, and Corona & Influenza are also common etiological agents. Infection of any part of the respiratory tract and linked structures is termed ARI. All infections <30 days duration is included. However, in the case of middle ear infections, the duration of an acute episode is <14 days[7].

One of the commonest characteristics of ARIs is pneumonia. Each year, ARI causes 15% of all deaths in children under the age of 5 a long time around the world. Almost 50% of these passings happen in Sub-Saharan Africa3.ARIs are not kept to the respiratory tract and have systemic impacts since of a conceivable expansion of contamination or microbial poisons, aggravation, and decreased lung function4. Vaccines are available that have been modified with the contributory living organisms of ARIs and are within the realm of possible ARI resistance mediation. Diphtheria, Pertussis, Measles, and Haemophilus influenza B vaccinations are available for ARI through the national immunization program (Hib). Vitamin A is given alongside the measles-rubella vaccine at 9 months of age.

ARI is associated with so many modifiable risk factors, and there is a lack of up-to-date data regarding ARI in the study area. This study was done to determine the risk factors that lead to the occurrence of ARI among children below the age of 5 in some selected hospitals in Mogadishu, Somalia.

Methods

This is a cross-sectional descriptive study.

Study area and study population

The study was done in Mogadishu City-Somalia with some selected and different hospitals, including Benadir Hospital, which is the main referral hospital based in Mogadishu.

The total population of Mogadishu was 2,180,000 in 2019, 4.71% from 2018. The study was done among under-five children (0-5 years) in the study area. The informants were the parents of the child. The study was carried out from August 2019 to Dec 2019.

Instruments and Reagents Used in the Study

The sample size was calculated to be 206 using single population formulas $N = \frac{\left(\frac{Z^{\alpha}}{2}\right)^2 p(1-P)}{d^2}$

With an allowable error of 5% of P, at 95% CI. This was calculated from the reference value from another study done in a similar setting by Hawassa University, Ethiopia. However due to the limitation of resources and time a sample size of 140 was taken.

The sampling procedure was the Probability Sampling Technique, Especially Simple Random Sampling, which allows all respondents to get the same probability of being selected during the data collection procedure among the under-five children attending selected Hospitals in Mogadishu City, Somalia. The parents having a child aged 0-5 years attending or visiting the selected hospitals within a time frame was included. But the parents who were not interested in participating in this study and who were suffering from critical health conditions were exempted from this study.

Study tool and Data Collection

Data was collected using a pre-tested, semi-structured, and interviewer-guided questionnaire; the questionnaire was pre-tested and finalized by incorporating inputs from the pre-testing. The questionnaires were organized first in English and then translated into Somali. Computerized excel was used for data collection, and the interviewer was trained by the investigator using electronic media.

Ethical approval, Informed consent, and support

The research ethics committee of the Daffodil International University examined the research proposal and approved. During the data collection, the data collector clearly explained the objectives, the study methods and its potential benefits to the participant parents. With the commitment of anonymity and confidentiality, we collected the data which was only used for the research purpose.

Results

In this study, the prevalence of ARIs among 140 under-five children was 41%, indicating the presence of acute respiratory infections at the time of the examination. Concerning the habit of carrying the child while cooking, the majority (56% of mothers or carers) replied yes, while the minority (44% stated no).

About 35.0% of the respondents were aged between 15 and 24 years old, 55.71% were 24-44 years old, and 9.28% were above 45 years old. Most of their respondents (55.71%) were married, 17.14% were divorced, and 4.28% were widowed. Regarding the occupation of the mothers, 55% were housewives, 5.71% were Petty trade, 21.42% were employed, and 22.85% were unemployed. Regarding the monthly income, 23.57% of the respondents were <100 USD, 55.71% of the respondents were between 100-300 USD, and 20.71% earned >300 USD (Table 1).

The majority of respondents, 111 (79.28%), stated that their infants were breastfed for the first six months. About maintaining child spacing <2years, 74 (52.85%) responded yes. More than half (62.85%) of the 88 respondents felt that their children had a typical birth weight of more than 2500 grams. The majority of respondents, 79 (56.42%), or more than half, reported that their children were moderately underweight, while 47 (33.57%) said that their children were severely underweight. Approximately 64 (45.71%) of the respondents (Mothers) stated that they attended three prenatal care consultations while pregnant.

Approximately 82 (58.57%) of those interviewed responded no to the following conditions (wheezing, congestion, runny nose, fever, sore throat, cough, and ear difficulties), while 58 (41.42%) said yes during the investigators' questioning. The majority of responders (87.14%) said yes to the question of whether or not their child received any vaccines. Around 81% (57.85%) of respondents said their infants received vitamin A at 9 months. Half of the mothers had no idea whether or whether their children had lost weight. During the first six months, 79% of women breastfeed their children (Table 2).

Table 1: Sociodemographic characteristics of respondents

Variable	Categories	Frequency n=140	Percentage %
Age of the respondents	15-24 years	49	35.0
	25-44 years	78	55.7
	45+ years	13	9.3
Gender of the parent	Female	94	67.1
	Male	46	32.8
Gender of the Child	Female	60	42.8
	Male	80	57.1
Age of the Child	0-24 months	56	40.0
	24-36 months	58	41.4
	48 -60 months	26	18.6
Marital status	Married	78	55.7
	Single	32	22.8
	Divorced	24	17.1
	Widow	6	4.3
Level of Education of the Respondents	Illiterate	27	19.3
	Informal	20	14.3
	Primary	36	25.7
	Secondary	20	14.3
	University	34	24.3
	Others	3	2.1
Mothers' Occupation	Employed	30	21.4
	Petty Trade	8	5.7
	Unemployed	32	22.9
	Housewife	70	50.0
Fathers' Occupation	Employed	30	21.4
	Petty Trade	8	5.7
	Unemployed	32	22.8
	Housewife	70	50.0
Current number of household members	1-3	26	18.57
	4-7	58	41.42
	8-10	46	32.85
	11 and above	10	7.14

Table 2: Distribution of the respondents by Nutritional Determinants

Variable	Category	Frequency n=140	Percentage (%)
Child breastfeeding for the first 6 months after birth	Yes (ever breastfed)	111	79.3
	No (never breastfed)	19	13.5
	Not sure	10	7.1
Birth spacing or interval	Yes <2 years	74	52.8
	No ≥ 2 years	66	47.1
Weight for height (wasting)	Normal	56	40.0
	Moderate	26	18.5
	Severe	58	41.4
Birth weight of the child	Low birth weight (< 2500 grams)	30	21.42
	Normal birth weight (>or = 2500 grams)	88	62.85
	Not sure	22	15.71
Current Diagnosis	Moderate underweight	79	56.42
	Severe underweight	47	33.57
	papers were not answered	14	10
Attending 3 antenatal care consultations while pregnant	Yes	64	45.71
	No	54	38.57
	Not sure	22	15.71
Having one of the following conditions (cough, wheezing, congestion, fever, runny nose, sore throat, ear problems)	Yes	58	41.42
	No	82	58.57
Child ever received any vaccines	Yes	87	62.14
	No	53	37.85

Table 3: Distribution of the respondents by household environmental factors

Variable	Category	Percentage (%)
The child gets weight loss before or after this condition	After	37.1
Type of the house	Mud and stone roofed with tin	40.0
Child having bedroom shared with other children	Yes	52.1
Time mothers spent in the kitchen	2 hours	38.6
Kitchen inside the house	Yes	65.7
The child is present in the kitchen while cooking	Yes	52.8
The habit of carrying the child during cooking	Yes	55.7
Type of fuel mainly used for cooking	Charcoal	70.0

This table shows the summary findings as determinants of Acute Respiratory Infections (ARIs) among under-five children in some selected hospitals in Mogadishu City –Somalia. In this table, carrying of child while cooking accounts for 55.7% of the respondents and is the most common cause of respiratory infections among under-five children in Mogadishu City –Somalia. Another factor is the fuel that Somalis mainly use for cooking which is charcoal and accounts 70%. In addition, most Somali people in their cooking style and overcrowding.

Discussion

Acute Respiratory Infections (ARI) are infections that occur when mucous membranes and other structures designed to keep the respiratory tract clear are imperiled and the immune system has not worked efficiently[8]. This study also found a link between maternal literacy and ARI but not between father's intellect. One study found that parental education reduced the risk of ARI[10]. The possible reason for the fact that fathers of a family normally stay outside of home with the purpose of employment while mothers work as a care-taker of its children and perform household chores. As the mother's attachment is significantly higher than their male counterpart, maternal educational attainment plays a significant role in ensuring the good health status of their children. Another risk factor which makes prone to the children to get ARIs is the kitchen that is inside the house and mothers have a habit of carrying the child during cooking period is another factor of ARIs and the time spent for cooking which the majority of the respondents above 50% reported for over 2 hours at least spent in the kitchen.

Prior studies from Ethiopia and India reported that the age of the child, weight for age, paternal education, and maternal occupation were found to be significantly associated with ARI[12,13,14]. sAccording to this study, 19.28% of the mothers were illiterates, while 14.28% of the respondents had formal education, 25.71% of the respondents were primary level, 14.28% were secondary level, and 24.28% were university level. Children from mothers who had no education or primary education only, had a higher possibility of developing an ARI than children from more educated mothers (secondary education and above) This is almost certainly because children spend more time with their mothers. Mothers' educational level will decide the quality of care and many social and environmental factors that the child will be exposed to. Most mothers were primarily literate, which discloses a probability of association between mother's education and ARIs. It could be regarded that those mothers who have not carried their child during cooking have a healthier child than those carried. The age group of the mothers were between 15-45 years old. Regarding occupation, 50% of the mothers were housewives and 22.42% were self-employed, 22.85% were unemployed, and only 5.71% were petty traders.Study shows that children of mothers who maintain birth intervals <2 years could have less infections than those who did not practice birth spacing. According to study findings, there could be a relationship between ARIs, and a mother's monthly household income, whereas in this study, only 20.71% of mothers had income above 300 USD. Another study in Zimbabwe revealed that higher income children are less likely to be affected by ARI in comparison with those from low income strata[12].The risk of acute respiratory infections (ARIs) increases with the number of people living in a household and the size of the household. The relative risk of ARIs in children living in houses with between 4-6 persons is 1.05 and those living in households with more than 7 people is 1.2412. There is a nexus between the status of ARI and the amount of space available for human habitation in urban areas. There are several limitations of this study.The sample size was low and simple random sampling was used to allocate participants which limits the findings of this research and cannot generalize for the whole population.

Conclusions

The prevalence of ARI is often associated with many socio-economic status and household environmental factors such as overcrowding, unemployment rates, and educational and housing quality, among other factors which increase the risk of ARI and should therefore be included in the strategies to reduce ARI incidence. There is still considerable work to be done in Somalia to combat ARI. Many NGOs, particularly WHO, UNICEF, and other funders, should consider putting mechanisms in place to combat this threat.

Recommendations

- To provide health education to mothers about the determinants of ARIs in order to raise their aware ness of their child's well-being.
- The health condition should be given more attention by all people concerned.
- A multi-centric study with larger sample size will be required to explore the factors of ARI.

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