Assessing Knowledge on Risk Factors and Management of Acute Respiratory Tract Infection of under Five Children among Nurses

Proma Debnath (RN, MPH) [1], KMA Shafique (MPH,MPhill)[2], Soumitra Chakrabarty (Library Science and Information Technology)[3]

Lecture, Sylhet Red Crescent Nursing College, Sylhet,Bangladesh,[1] Assistant professor, Leading University Sylhet, Bangladesh,[2] lecturer of Librarian, Sylhet Red Crescent Nursing College, Sylhet, Bangladesh,[3]

Abstract

Background: *An acute respiratory infection (ARIs) is one of the leading causes of morbidity and mortality among children especially in low-income countries.* ***Objectives:*** *The study was conducted to assess the knowledge of nurses on ARI in a tertiary level Hospital at Sylhet, Bangladesh.*

Methods: *This descriptive type of cross-sectional study was designed to find out senior staff nurses' knowledge on ARI at Sylhet MAG Osmani Medical College Hospital. Hundred one nurses were selected through purposive sampling technique from SOMCH.*

Results: *The most commonly reported on risk factors of ARI. Among the respondents (n=101), Maximum of respondents (n= 90), 90.1% were mentioned Low birth weight, the mean respondents' knowledge on Risk Factors for ARI was Good Knowledge (72.5%). Distribution of the respondent's knowledge on symptoms of ARI, among the respondents, 91.1 % (n=92) said Difficulty breathing, 81.2% (n=82) Cough, 69.3% (n=70) Fever and 67.3% (n=68) Respiratory distress were stated symptoms of ARI. The mean respondents' knowledge on Symptoms for ARI is Excellent Knowledge (78%). The mean respondents' knowledge on Complications for ARI is Good Knowledge (68%). Knowledge on Nursing Management of ARI, a majority 100.0% (101) mediation, propped up position 88.1%, (89) oxygen 91.1% (92) and count respiration73.3% (74) regarding nursing management of ARI. The mean is (89%) excellent knowledge. Among (n=101), the mean respondents' knowledge on Preventive Measures of ARI was Excellent (94.25%). The mean respondents' knowledge on health education to Public for Prevention of ARI as a nurse was excellent (96%). About (58.8%) had Good Knowledge about complications of ARI. Preventive Measures of ARI had found Excellent (94.25%) and Health Education to Public for Prevention of ARI as a nurse also had Excellent Knowledge (95%).*

Conclusion: *Education and training program should be provided to improve senior staff nurse's knowledge regarding ARI who were working at Sylhet MAG Osmani Medical College Hospital. Further large-scale studies are recommended among senior staff nurses.*

Key Words: *Pediatric, Acute Respiratory Tract Infection, Risk factors, Knowledge, Senior Staff Nurse.*

I.   Introduction

Globally, the four major killers of children under five years old are ARI, diarrheal diseases, preterm birth complications, and birth asphyxia. ARI remains the leading cause of mortality in children under five worldwide. Of the estimated 6.9 million child deaths each year, ARI accounts for anywhere from 1.3 to 1.6 million deaths a year in this age group, roughly 18% of deaths among children under age five (Sazawal S, 2003).

According to WHO ARI is considered as the forgotten killer of children and it is the leading cause of childhood morbidity and death in many developing countries causing 2 million deaths worldwide each year. ARI is an important public health problem in Bangladesh. The senior staff nurses should be educated to recognize the signs and symptoms of ARI to understand the importance of early detection and adequate treatment especially the incidence of ARI is more prevalent among under five children and these children are dependants on duty nurses for their quality care. The prevalence of ARI exist universally in all population and it is the determining factor contributing to high mortality and it is considered as a major public health problem in Bangladesh accounting for one third of under five deaths (WHO-2003).

ARI has an adverse effect on child survival & development & may even be an important factor for morbidity while it is recognized that the causes of ARI are multi-factorial, emphasis is given to those factors that

---

are believed to greatest importance in developing countries. These include vaccination against Haemophilus influenza, streptococcus ARI, proper nutrition, Hygienic practices etc. Bangladesh is a vast country where 01 million babies are born every year with world's second largest population. Among this under five mortalities is ranging from 01 to over three hundred deaths out of 1000 live birth in the year 2000 about 70% that is 1.89 million deaths of children has occurred due to acute respiratory infections. Out of these acute respiratory infections, ARI is leading killer. ARI among under five children continues to remain a major public health concern in Bangladesh (UNICEF-2000).

ARI is the single leading cause of mortality in children under five and is a major cause of child mortality in every region of the world, with most deaths occurring in sub-Saharan Africa and South Asia. ARI kills more children under five than AIDS, malaria, and measles combined, yet increased attention in recent years have been on the latter diseases. ARI is a form of acute respiratory tract infection (ARTI) that affects the lungs. When an individual has ARI, the alveoli in the lungs are filled with pus and fluid, which makes breathing painful and limits oxygen intake. ARI has many possible causes, but the most common are bacteria and viruses. The most common pathogens are Streptococcus ARI, Haemophilus influenza type b (Hib), and respiratory syncytial virus (RSV).S.ARIeis the most common cause of bacterial ARI in children under five years in the developing world.4 The second most common cause of bacterial ARI in children is Hib, followed by RSV - the most common cause of viral ARI in children under two years. The populations most at risk for ARI are children under five years, people aged 65 or over, and people with pre-existing health problems.

Streptococcus ARI frequently colonizes the upper respiratory tract. The human nasopharynx is the only natural reservoir for S. ARI and these bacteria along with viruses are commonly found in a child's nose or throat; these pathogens are then aspirated into the lungs, causing disease. ARI can be spread in a number of ways. The pathogen is transmitted through direct contact with respiratory secretions, colonizes the nasopharynx and may then cause blood-borne diseases. S. ARI can cause both non-invasive and invasive disease in all age groups, particularly in children younger than five years and adults 65 years or older.2 3 In addition, people with certain medical conditions, such as chronic heart, lung, or liver diseases, or sickle cell anemia are also at increased risk for pneumococcal diseases. People living with HIV/AIDS or people who have had organ transplants and are taking medications that decrease their immunity to infection are also at high risk of getting this disease.5A healthy child has many natural defenses that protect its lungs from ARI. Undernourished children, especially those who are not exclusively breastfed or with inadequate zinc intake, are at a higher risk of developing ARI. Immunosuppression due to other infections are important risk factors in ARI-related mortality; infants, children, or the elderly suffering from illnesses, such as AIDS, measles, or malaria are also more likely to develop ARI. Additionally, environmental factors, such as crowded living conditions and exposure to indoor air pollution may contribute to increasing children's susceptibility to ARI. The Lancet Global Burden of Disease (GBD) Study 2010 has a category for lower respiratory tract infections (LRTI), which includes influenza, Streptococcus ARIe (pneumococcal ARI), Haemophilus influenza type b (Hib), respiratory syncytial virus (RSV), and "other lower respiratory infections. For the purposes of this report, pneumococcal. (Sazawal S, 2003).

II.   Mistrials and Methods

Study Design: A descriptive type of cross- sectional study was conducted with the aim of assessing knowledge of Nurses on care for ARI at Sylhet MAG Osmani Medical College Hospital.

Study Location: The study was conducted at Sylhet MAG Osmani Medical College Hospital which is Government hospital. It is the top medical college in Bangladesh and situated at the heart of the city in the academic zone in Bangladesh. Total capacity of the hospitals is 2400 where the total number of nurses in the hospital is 1970. It provides both preventive and curative care services to peoples at the tertiary level. But our study unit is Pediatrics Department which has 110 populations only.

Study Duration : The period of study was four months from September to December, 2019.

Sample Size: Sample of the study was 101 nurses who have been working in pediatric department at Sylhet MAG Osmani Medical College Hospital.

Sample Technique: Purposive Sampling Technique was followed in this study.

Study Population: The study population of this study is all nurses who have been working in pediatric department total population was 110 at Sylhet MAG Osmani Medical College Hospital.

Inclusion criteria
➢   Nurses having Diploma in nursing and in additional higher degree.
➢   Nurses having at list one year job experience in the setting.
➢   Nurses who will participate the study willingly.

Exclusion criteria
➢   Nurses who will not be interested and will not co-operate.
➢   Nurses having less than one year job experience in the setting.

➢   Nurses who will be absent.

Data collection Instrument
A semi- structured questionnaire was prepare in the light of objectives. The questionnaire was self-administered. It was pre-tested. On the basis of experience and expert openion of my guide the final questionnaire was prepared. The purpose of the study was explained clearly to the respondent before interviewed. One questionnaire was used for each respondent for data collection.

Data collection
At first the respondents were greeted properly and provided sitting arrangement in comfortable condition. At first the purpose of the study was explained to the respondents with written inform consent paper and all about the study then the respondents were interviewed face to face on the basis of interview questionnaire by the investigators. One questionnaire was used for each respondent.

Data processing and analysis
After collecting data checked & verified daily an audited for errors and inconsistencies. All the results will be calculated with help of computer by using the SPSS program.

III.   Result
Figure −1 shows the age distribution of the respondents. Among the respondents, 39.6% (n=40) were of the Senior staff nurses were in the high age group (35-40) yrs. and 2% (n=2) were lowest in the age of 26-32 yrs. While 21.8% (n=22) were in age group of 28-35 years, 19.8% (n= 20) were in the group of 40-45 years, 11.9% (n= 12) were in the age group of ≥ 50 years and 5% (n=5) were in the age group of 45-50 years. (n = 101).

Table 1: Distribution of respondents by age

Age in years	Frequency	Percentages
<28	2	2.0
28-35	22	21.8
35-40	40	39.6
40-45	20	19.8
45-50	5	5.0
≥50	12	11.9
Total	**101**	**100.0**
Mean Age (in years)	**39.38**	

All of respondents were female.
This figure-1, demonstrates that the majority (n=94) of the respondents (94%) were married and minority (n=5) of respondents (5%) were single and remaining 2% (n=2) respondent were Divorced.
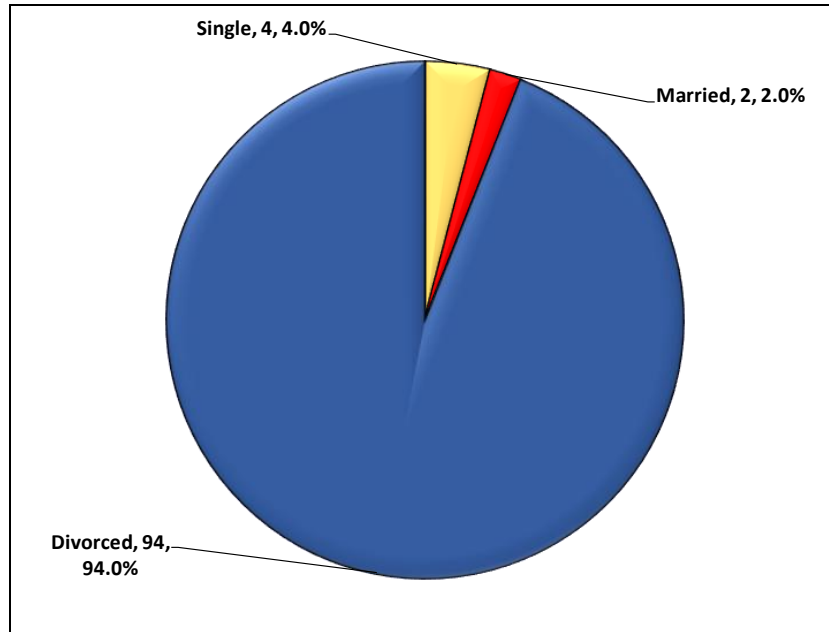
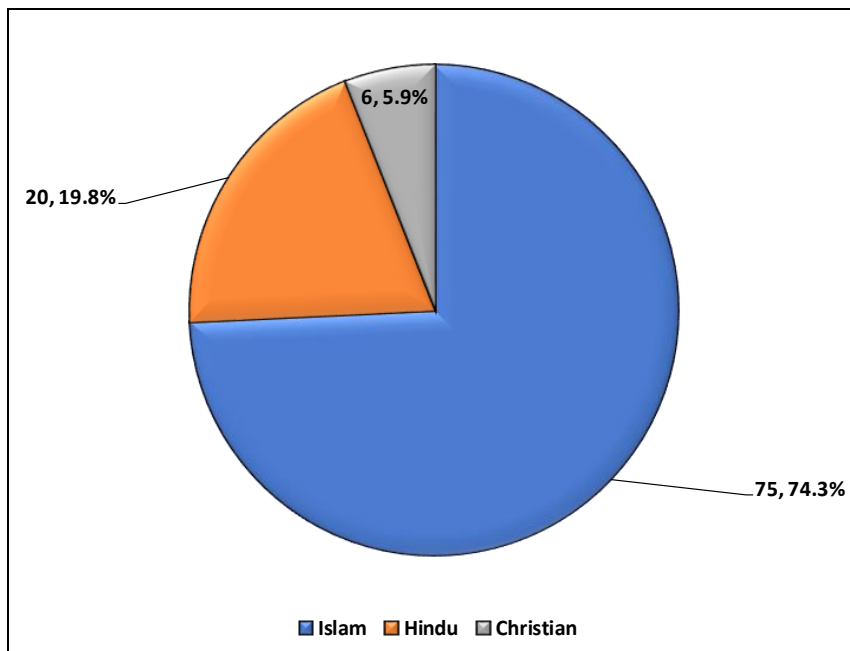**Figure 1**. Distribution of the respondents by marital status

Figure 2. Distribution of the respondents by religion

This Figure 2, re-presents that among 101 respondents, the maximum respondents (n=75) were Islam (74.3 %) and the minimum respondents (n=6) were Christian (5.9%) and 19.8% of respondents were Hindu (n=20).

Table 2 conveys that among the respondents, the highest levels of Professional education were Diploma in nursing (92%) and a few amounts of the respondents (n=6) were B.Sc (6%) and 3% of respondents were M.Sc (n=3).

Table 2: Distribution of respondents by professional educational qualification

Professional Educational Qualification	Frequency	Percentages
Diploma	92	91.1
B. Sc	6	5.9
M. Sc/MPH	3	3.0
Total	**101**	**100.0**

This table 3, shows that the highest (55.4%) of the respondents had more experienced service in 1-20 years and the lowest respondents were 5% & 4% in group ≥30 and ≤ 5 years. Whereas 19.8% of respondents were in service experience 5-10years and 16% of respondents were in service experience 20-30 years.

Table 3: Distribution of respondents by service experience

Service Experiences (in years)	Frequency	Percentages
1-5	4	4.0
5-10	20	19.8
10-20	56	55.4
20-30	16	15.8
≥30	5	5.0
Total	**101**	**100.0**

This table 4, mentions that among 101 respondents, 41.6% (n=42) had special training, and 58.4% (n=59) had no special training on management of ARI.

Table 4: Distribution of respondents by training on nursing management of ARI

Service Experiences (in years)	Frequency	Percentages
Yes	42	41.6
No	59	58.4
Total	**101**	**100.0**

Knowledge Based Result

This table 5 shows distribution of respondents' knowledge on concept of ARI. Among the respondents (n=101), 100% were responded concept, 100% (n=101) of ARI. The mean score level is excellent (100%)

Table 5: Distribution of respondents by responses on concept of ARI

Service Experiences (in years)	Frequency	Percentages
Lung diseases	101	100.0
Inflammation of lung	101	100.0

Table 6 highlight distribution of respondents' knowledge on causative organisms for ARI.
Among the respondents (n=101), 100% (n=101) had expressed Streptococcus ARI, 59.4% (n=60) had expressed two types Maximum respondents were 50.5% (n=51) which had expressed two Klebsiella ARI 19.8% (n= 20) of

respondents were disclosed Escherichia coli and minimum were 5.9% (n=6) which had expressed Haemophilus on Causative organisms for ARI. The mean average 34%.

Table 6: Distribution of respondent's knowledge by causative organisms for ARI

Causative organisms	Frequency	Percentages
Streptococcus ARI,	60	59.4
Klebsiella ARI	51	50.5
Escherichia coli	20	19.8
Haemophilus	06	5.9

Table 7 shows that the most commonly reported on risk factors of ARI. Among the respondents (n=101), Maximum of respondents (n= 91), 90.1 % were mentioned Low birth weight, 69.3% (n= 70) of respondents were stated Lack of exclusive breastfeeding, 65.3% (n=66) of respondents were cited Malnutrition and 63.4% (n=64) of respondents were declared Lack of immunization which were related risk factors of ARI. The mean respondents' knowledge on Risk Factors for ARI is Good Knowledge (72.5%).

Table 7: Distribution of respondent's knowledge by risk factors of ARI

Risk factors	Frequency	Percentages
Low birth weight	91	90.1
Lack of exclusive breastfeeding	70	69.3
Malnutrition	66	65.3
Lack of immunization	64	63.4

Table 8 shows distribution of the respondent's knowledge on symptoms of ARI, among the respondents, 91.1 % (n=92) said Difficulty breathing, 81.2% (n=82) Cough, 69.3% (n=70) Fever and 67.3% (n=68) Respiratory distress were stated symptoms of ARI. The mean respondents' knowledge on Symptoms for ARI is Excellent Knowledge (78%).

Table 8: Distribution of respondent's knowledge by symptoms of ARI

Symptoms of ARI	Frequency	Percentages
Difficulty breathing	92	91.1
Cough	82	81.2
Fever	70	69.3
Respiratory distress	68	67.3

In the table 9, a majority 93.1 % (n=94) claimed that Chest in drawing was sign of ARI. 71.3% (n=72) responded expressed that Breathlessness and cyanosis, 69.3% (n=70) of responded cited that was Unable to drink and 67.3 %(n=68) of responded stated wheezing regarding sign of ARI. The mean respondents' knowledge on Signs for ARI is Excellent Knowledge (76%)

Table 9: Distribution of respondent's knowledge by signs of ARI

Signs of ARI	Frequency	Percentages
Chest in drawing	94	93.1
Breathlessness and cyanosis	72	71.3
Unable to drink	70	69.3
Wheezing	68	67.3

This table 10 shows distribution of respondents' knowledge on Nursing Management of ARI, a majority 100.0% (101) mediation, propped up position 88.1%, (89) oxygen 91.1% (92) and count respiration73.3% (74) regarding nursing management of ARI. The mean is (89%) excellent knowledge

Table 10: Distribution of respondent's knowledge by nursing management of ARI

Nursing Management of ARI	Frequency	Percentages
Medication	101	100.0
Propped up position	89	88.1
Oxygen	92	91.1
Count respiration	74	73.3

Table 11 shows distribution of the respondent's knowledge on complications of ARI, among the respondents, 885.1% (n=86) stated Bronchitis, 73.3% (n=74) Asthma, 71.3% (n=72) Death and 39.6% (n=40) Septicemia. The mean respondents' knowledge on Complications for ARI is Good Knowledge (58.8%)

Table 11: Distribution of respondent's knowledge by complications of ARI

Complications of ARI	Frequency	Percentages
Bronchitis	86	85.1
Asthma	74	73.3
Death	72	71.3
Septicemia	40	39.6

Table 12 describes Distribution of Respondent's Knowledge on Preventive Measures of ARI. Among (n=101), 100% (n=101) of respondent demanded that immunization is the preventive measures of ARI, 95% (n=96) respondents mentioned that Exclusive breastfeeding is the preventive measures of ARI, 91.1% (n=92) of respondent expressed Mothers education and 87.1% (n=88) Healthy environment for Preventive Measures of ARI. The mean respondents' knowledge on Preventive Measures of ARI is Excellent Knowledge (95%).

Table 12: Distribution of respondent's knowledge by preventive measures of ARI

Preventive measures of ARI	Frequency	Percentages
Immunization	101	100.0
Exclusive breastfeeding	96	95.0
Mothers education	92	91.1
Healthy environment	88	87.1

Table 13 illustrate distribution of respondent's knowledge on Health Education to Public for Prevention of ARI as a nurse. About 100% (n=101) of respondents were ensured used Immunization and Breast feeding and 85.1% (n=86) of respondents were made sure hand hygiene. The mean respondents' knowledge on Health Education to Public for Prevention of ARI as a nurse is Excellent Knowledge (91%).

Table 13: Distribution of respondent's Knowledge by health education to public for prevention of ARI as a nurse

Health Education	Frequency	Percentages
Immunization	101	100.0
Breast feeding	86	85.1
Hand hygiene	86	85.1

IV.   Discussion

Among the respondents, 39.6. % (n=40) were of the Senior staff nurses were in the high age group (35-40) yrs. and 2% (n=2) were lowest in the age of 26-32 yrs. While 21.8% (n=22) were in age group of 28-35 years, 21.8% (n= 20) were in the group of 40-45 years, 11.9% (n= 12) were in the age group of ≥ 50 years and 5% (n=5) were in the age group of 45-50 years. The majority (n=94) of the respondents (94%) were married and minority (n=5) of respondents (5%) were single and remaining 2% (n=2) respondent were Divorced. Among 101 respondents, the maximum respondents (n=75) were Islam (74.3 %) and the minimum respondents (n=6) were Christian (5.9%) and 19.8% of respondents were Hindu (n=20).

The highest levels of Professional education were Diploma in nursing (91.1%) and a few amounts of the respondents (n=3) were M.Sc (3%) and 5.9% of respondents were B.Sc (n=6) .The highest (55.4%) of the respondents had more experienced service in   10-20 years and   The lowest respondents were 5% &   4% between in group ≥30 and 1- 5 years. Whereas 19.8% of respondents were in service experience 5-10years and 15.8% of respondents were in service experience 20-30 years. The mean age of the respondents was 20 years.

Among 101 respondents, 41.6% (n=42) had special training, and 58.4 % (n=59) had no special training on management of ARI.

Distribution of respondents' knowledge on concept of ARI. Among the respondents (n=101), 100% were responded meaning, 100% (n=101). The mean score level is excellent (100%).

Distribution of respondents' knowledge on causative organisms for ARI. Among the respondents (n=101), 100% (n=101) had expressed Streptococcus ARI, 59.4% (n=60). Maximum respondents were 50.5% (n=51) which had expressed two Klebsiella ARI 19.8% (n= 20) of respondents were Escherichia coli and minimum were 5.9% (n=6) which had expressed Haemophilus on Causative organisms for ARI. The   mean respondents' knowledge on Causative organisms for ARI is Average (34%).

The most commonly reported on risk factors of ARI. Among the respondents (n=101), Maximum of respondents (n= 90), 90.1% were mentioned Low birth weight, 69.3% (n=70) of respondents were stated Lack of exclusive breastfeeding, 65.3% (n=66) of respondents were cited Malnutrition and 63.4% (n=64) of respondents were declared Lack of immunization which were related risk factors of ARI. The   mean respondents' knowledge on Risk Factors for ARI is Good Knowledge (72.5%).

Distribution of the respondent's knowledge on symptoms of ARI, among the respondents, 91.1 % (n=92) said Difficulty breathing, 81.2% (n=82) Cough, 69.3% (n=70) Fever and 67.3% (n=68) Respiratory distress were stated symptoms of ARI. The   mean respondents' knowledge on Symptoms for ARI is Excellent Knowledge (78%).

A majority 93.1 % (n=94) claimed that Chest in drawing was sign of ARI. 71.3% (n=72) responded expressed that Breathlessness and cyanosis, 70% (n=70) of responded cited that was Unable to drink and 69.3 %(n=68) of responded stated wheezing regarding sign of ARI. The   mean respondents' knowledge on Signs for ARI is Excellent Knowledge (76%)

Distribution of the respondent's knowledge on complications of ARI, among the respondents, 85.1% (n=86) stated Bronchitis, 73.3% (n=74) Meningitis, 71.3% (n=72) Death and 39.6% (n=40) Septicemia. The mean respondents' knowledge on Complications for ARI is Good Knowledge (68%).

Distribution of Respondent's Knowledge on Preventive Measures of ARI. Among (n=101), 100% (n=101) of respondent demanded that immunization is the preventive measures of ARI, 95.0% (n=96) respondents mentioned that Exclusive breastfeeding is the preventive measures of ARI, 91.1% (n=92) of respondent expressed Mothers education and 87.1% (n=88) Healthy environment for Preventive Measures of ARI. The mean respondents' knowledge on Preventive Measures of ARI is Excellent Knowledge (94.25%).

Distribution of Respondent's knowledge on Health Education to Public for Prevention of ARI as a nurse. About 100% (n=101) of respondents were ensured used Immunization and Breast feeding and 85.1% (n=86) of respondents were made sure hand hygiene. The mean respondents' knowledge on Health Education to Public for Prevention of ARI as a nurse is Excellent Knowledge (96%).

Distribution of Respondent's overall knowledge. Among the respondents (101), The mean score level on concept and group of population suffering ARI is excellent (100.0%), Causative organisms for ARI is Average (34%), Risk Factors for ARI is Good Knowledge (72.5%), Symptoms for ARI is Excellent Knowledge (78%), Signs for ARI is Excellent Knowledge (76%), Complications for ARI is Good Knowledge (58.8%), Preventive Measures of ARI is Excellent Knowledge (94.25%) and Health Education to Public for Prevention of ARI as a nurse is Excellent Knowledge (95%).

V. Conclusion

This study was descriptive cross-sectional study designed to find out senior staff nurses' knowledge on care for ARI at Sylhet MAG Osmani Medical College Hospital. Hundred one nurses were selected through purposive sampling technique from SOMCH. On the basis of the result of the study the following recommendations are proposed to minimize the morbidity and mortality of ARI patients under five children and also to reduce the incidence and prevalence of ARI. Education and training program should be provided to improve senior staff nurse's knowledge regarding nursing management on care for ARI who are working at Sylhet MAG Osmani Medical College Hospital. Further large-scale studies are recommended among senior staff nurses.

Limitation of the Study: Due to time, resource & budget constraints, convenient sampling procedures were followed. As sample was not selected randomly, gathered data are not representative in nature. But it is expected that it would be helpful for intervention programme to generate a

primary understanding about the severity of this new problem.

Recommendation

➢ On the basis of the result of the study the following recommendations are proposed to minimize the morbidity and mortality of ARI patients under five children and also to reduce the incidence and prevalence of ARI.

➢ Education and training program should be provided to improve senior staff nurse's knowledge regarding nursing management on care for ARI who are working at Sylhet MAG Osmani Medical College Hospital.

➢ Further large scale studies are recommended among Senior Staff Nurses.

➢ For further studies it will helpful to expand this study and finally including Senior Staff Nurses in this type of study may enhance their awareness and encourage providing best patient care.

References

[1]. Assaad U, et al. ARI immunization in older adults: review of vaccine effectiveness and strategies. ClinInterv Aging. 2012;7:453-461.
[2]. American Thoracic Society. Guidelines for the initial management of adults with community-acquired ARI: Diagnosis, assessment of severity, and initial antimicrobial therapy. Am J RespCrit Care Med. 2001, 163: 1730-1754.
[3]. Assaad U, et al. ARI immunization in older adults: review of vaccine effectiveness and strategies. ClinInterv Aging. 2012;7:453-461.
[4]. Ayub Med Coll Abbottabad. 2011 Jan-Mar;23(1):146-9. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/22830171
[5]. Basavanthappa BT. Nursing Research.2nded.NewDelhi:Jaypee brothers; 2006.
[6]. Bassin AS, Niederman MS.New approaches to prevention and treatment of nosocomial ARI. SeminThoracCardiovasc Surg. 1995, 7: 70-77.
[7]. Centers for Disease Control and Prevention. Fast Fact: ARI. 2014. www.cdc.gov/nchs/fastats/ARI.htm
[8]. FMOH, Central Bureau of Statistics, UNICEF. Multiple Indicator Cluster Survey, 2000, Sudan. 2000.
[9]. Hoyert DL, Heron MP, Murphy SL, Kung HC. Deaths: Final data for 2003. Natl Vital Stat Rep. 2006, 54: (13): 1-120.
[10]. Head B, et al. Nursing diagnoses, interventions, and patient outcomes for hospitalized older adults with ARI. Res GerontolNurs. 2011;4(2):95-105.
[11]. Lung and Asthma Information Agency. The Burden of Respiratory Disease, Factsheet 3. London: LAIA, 1995
[12]. Park K. Park's text book of preventive and social medicine. 19thed. Jabalpur: Banarsidas Bhanot ; 2007.p.142-147.
[13]. Porth C. Pathophysiology. Concepts of Altered Health States. 9th ed. Philadelphia, PA: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2013: 665-669.
[14]. Schweon S. Double jeopardy: Pneumococcal ARI following seasonal influenza. Nursing. 2010;40(12):60-61.
[15]. Sazawal S, Black RE. Effect of ARI case management on mortality in neonates, infants, and preschool children: a meta-analysis of community based trials. The Lancet Infectious Diseases 2003; 3(9):547-556.
[16]. Stewart MK,ParkerB,chakraborty J, et.al . Acute respiratory infections in rural Bangladesh: Perceptions and practices. Medical anthropology 1994 May;15(4):377-94.
[17]. ARI the forgotten killer: Available from URL:http://www.childinfo.org/files/ARI
[18]. Wiblin RT, Wenzel RP. Hospital-acquired ARI.CurrClin Top Infect Dis. 1996, 16: 194-214.
[19]. World Health Organization. World Health Report 2003 - Shaping the Future. 2003. Geneva, World Health Organization.