



# Knowledge And Practice On Meningitis And Its Management Of The Senior Staff Nurses Working In M Abdul Rahim Medical College Hospital, Dinajpur

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## ABSTRACT

This was a cross sectional type of descriptive study which was carried out with a view to assess knowledge and practice on meningitis and its management of the senior staff nurses working in M Abdul Rahim Medical College Hospital, Dinajpur. The sample size was 302 which was selected purposively. Majorities (50.0%) of the respondents were in the age group of 46 years and above and the mean age of the respondents was  $44.77 \pm 6.62$  years. Majority (52.0%) of the respondents had BSc in nursing degree and 16.6% had master degree. The mean service length of the respondents was  $20.32 \pm 8.19$  years. Most (62.6%) of the respondents had monthly family income of Taka up to 30000 and the average monthly family income was BDT  $33,440.40 \pm 10,175.93$ . About 26.2% of the respondents were in duty in medicine ward. Most (96.7%) of the respondents knew the disease as tick borne meningoencephalitis, due to measles and varicella-zoster virus. Most (96.7%) of the respondents knew about causative agents like *Listeria monocytogenes*, *Neisseria meningitidis*, tuberculosis, rickettsia, *Proxymonaxia*, which were responsible for viral meningitis, most (96.7%) of the respondents knew that the agents responsible for protozoal meningitis predominantly Primary meningoencephalitis were *Naegleria fowleri*, *Sappinia diploidea*, *Trypanosoma*, etc. Most (99.7%) of the respondents knew the complications of meningitis as disseminated intravascular coagulation and cerebral palsy. Most (99.7%) of the respondents knew that the children were the risk group of meningitis, majority (99.0%) of the respondents knew that the most common organisms that cause acute meningitis were *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae*. Most (98.7%) of the respondents knew about prognosis of meningitis, which were associated with high mortality and severe morbidity. Most (99.67%) the respondents were female and majority (78.48%) of the respondents had in service training. The relationship of age group of the respondents with knowledge on cause of acute meningitis and knowledge on agents responsible for meningitis were found statistically significant ( $p < 0.01$  each). The relationship of professional educational qualification of the respondents with knowledge on cause of acute meningitis and knowledge on agents responsible for meningitis were also found statistically significant ( $p < 0.01$  each). The study findings might be the basis for further in-depth study in this regard.

**Keywords:** Nurses, knowledge, practice, meningitis, management, senior staff nurses

## INTRODUCTION

Meningitis is a term used to describe an inflammation of the membranes that surround the brain or the spinal cord. Meningitis, especially bacterial meningitis, is a potentially life-threatening condition that can rapidly progress to permanent brain damage, neurologic problems, and even death of children.' The highest incidence of meningitis is between birth and 2 years, with the greatest risk immediately following birth and at 3-8 months of age. Increased exposure to infections and underlying immune system problems present at birth increase an infant's risk of meningitis. Quality has become a major focus within health care, especially

in the areas of regulatory quality, quality assurance, quality improvement and patient safety. As this focus increases, nurses today have many roles; in addition to meeting the needs of patients and serving as part of the health care team, nurses play a key role in meeting quality nursing care to children outcomes and safety, in such areas as medication safety, communication and patient safety. This role allows nurses to contribute to quality improvement.

Clinical pathway is a tool or care plans that detail essential steps in patient care with a view to describing the expected progress of the patient. It is also known as critical pathway, integrated care pathway, critical path, care maps and care paths and they are being embraced in many system. Meanwhile, the concept of clinical pathway (Cp) refers to specific guidelines for care that describe patient treatment goals and define a sequence and timing of intervention for meeting those goals efficiently.

The goal of clinical pathway system is to plan for the best care at the lowest cost by increasing collaboration and efficiency among clinical and across disciplines, promoting timeless use of hospital resources, reducing system breakdowns, and focusing the health care teams attention on important aspects of care and the cost. Meanwhile, clinical pathways were used as a communication tool between professionals to manage and standardize outcome-oriented care. The most important and significant factor in survival of children with meningitis is the standard of nursing care provided to meet their requirements. Thus, the nurse must possess broad knowledge for different methods of care for children with meningitis and practical skills in the application of therapies directed toward solving many problems that children exposed to invasive procedures."

Nurses have a key role in all aspects of clinical pathway use. Participating in the development of the pathway is the first step, because they begin and end the chain of staff involved in delivering care of children with meningitis. Meanwhile, nurses possess a unique perspective in how health care system works to enhance or impede the delivering of care. Thus, nurses are responsible for initiating the pathway on appropriate patients and ensuring that the various events occur as planned. Meningitis continues to claim many lives, despite the availability of potent antibiotics to destroy the deadly pathogens. It often emerges suddenly in a previously healthy child or adult, and if diagnosed and treated rapidly, neurologic outcome is excellent. A delay in diagnosis usually means morbidity or death. Bacterial meningitis is an acute purulent infection within the subarachnoid space that is followed by a CNS inflammatory reaction that causes coma, seizure activity, increased intracranial pressure, and ischaemic infarcts. The meninges, the subarachnoid space and the brain parenchyma are together involved in the inflammatory reaction; hence 'meningoencephalitis' is the most appropriate term. The study provided important information regarding knowledge of senior staff nurses on meningoencephalitis, which was very essential component of health care service delivery system.

### **JUSTIFICATION OF THE STUDY**

Meningitis is a medical emergency. The prognosis depends mainly on the pathogen and host immunologic state. Correct immediate diagnosis and introduction of symptomatic and specific therapy has a dramatic influence upon survival and reduces the extent of permanent brain injury. Clinical involvement of the central nervous system (CNS) is an unusual manifestation of human viral infection. The spectrum of brain involvement and the outcome of the disease are dependent on the specific pathogen, the immunologic state of the host and environmental factors although specific therapy is limited only to several viral agents. correct diagnosis and supportive and symptomatic treatment (when no specific therapy is available) are mandatory to ensure the best prognosis. This document addresses the optimal clinical approach to CNS infections caused by viruses. Robert Whytt initially described symptoms and signs of tuberculous meningitis in 1768 and called this "dropsy in the brain". He considered the collection of fluid in the ventricles as the disease itself, most likely because at the end of the 18th century the ventricles were regarded as the seat of the soul. Physicians at that time attributed somnolence and coma to a collection of fluid in the "seat of the soul" (i.e., 'acute hydrocephalus'). By the end of 18<sup>th</sup> century, investigators were beginning to shift their attention from the ventricles to the meninges. Meningococcal meningitis, or – as it was previously called – "cerebrospinal fever", was first described by Gaspard Vieusseux on a small outbreak in Geneva in 1805. The first patient on whom Heinrich Quincke performed a lumbar puncture reportedly had meningococcal meningitis, and Quincke is credited with describing the technique of lumbar puncture (1891), though Heuber was the first to recover "biscuit-shaped" meningococci from the spinal fluid.

Anton Weichselbaum was credited with identifying the meningococcus in 1887, and describing it as the *Diplococcus intracellularis meningitidis*. In the late 19th century, meningitis was treated by drainage of CSF by repeated lumbar punctures. At the turn of the century, Jochmann in Germany and Flexner in New York began experiments that demonstrated the protective effects of anti-meningococcal serum in experimental meningococcal infections in animals. The discovery of antibacterial activity of sulphonamides in the early 1930s ushered in the antibiotic era. Francis Schwentker treated first patient of meningococcal meningitis with sulphonamide therapy. *Mycobacterium tuberculosis* and *Neisseria meningitidis* were the two most common causative organisms of meningitis. Sir Alexander Fleming, the Scottish bacteriologist, discovered penicillin in 1928. For this he became the co-winner of the Nobel Prize in 1945. Children suffering from meningitis require special care from nurses to ensure maximum performance. By applying the clinical pathway, it provides opportunities for collaborative practice and team approaches that can maximize the expertise of multi health care team. Meanwhile, clinical pathways provide an appropriate framework to promote and measure the success of the clinical effectiveness cycle. Therefore, this study was conducted to assess the effect of clinical pathway on nurses regarding to care of children with meningitis.

## RESEARCH QUESTION

Do the senior staff nurses of M Abdur Rahim Medical College Hospital possess proper knowledge regarding meningitis and its management?

## OBJECTIVES

### General objective

The study was carried out with a view to assess knowledge and practice on meningitis and its management of the senior staff nurses working in M Abdur Rahim Medical College Hospital, Dinajpur.

### Specific objectives

- To assess knowledge on meningitis and its management of senior staff nurses.
- To observe practice of management of meningitis of senior staff nurses.
- To find out socio-demographic characteristics of the respondents.
- To find out the relationship between knowledge on meningitis and its management and socio-demographic characteristics of the respondents.
- To find out the relationship between knowledge and practice on meningitis and its management of the senior staff nurses.

### Variables used in this study

A. **Dependent variable:** Knowledge on meningitis and its management Practice on meningitis and its management

### B. Socio-demographic variables

1. Age of the respondents
2. Sex
3. Academic qualification
4. Professional qualification
5. Marital status
6. Length of service
7. Any training on infection control
8. Religion
9. Residence
10. Monthly family income
11. In service training
12. Designation of the respondents
13. Current working place of the respondents

## OPERATIONAL DEFINITIONS

### Type of family:

In this study families were classified as follows:

- (a) Nuclear family: Parents or parent (either father or mother) with one or more unmarried children.
- (b) Extended (Non nuclear) family: Parents or parent with married or never married children with or without relatives (e.g., father-in-law, mother-in-law, uncle, aunt, etc) eating from the same kitchen.

**Income:** Material return in kind or cash in exchange of goods and services earned by the person (respondent) only is known as personal income and by the household members is known as household income. Household income or total family income consists of total income of all the members of the family living in the same household and taking food from the same cooking pot.

## METHODOLOGY

**Type of study:** This was a cross-sectional type of descriptive study.

**Place of study:** The study was carried out in the Department of Public Health of Varendra University.

**Duration of the study:** This research work was a part of Master of Public Health (MPH) programme of Varendra University with duration of 4 months in the summer session from May, 2017 to August, 2017.

**Study population:** All the senior staff nurses working at M Abdur Rahim Medical College Hospital, Dinajpur during the study period constituted the study population.

**Sample size:** The sample size of this study was 302.

**Determination of sample size:** The sample size was determined by using the following formula:

$$\text{Sample size, } n = (z^2pq)/d^2$$

Where, p = proportion of factor in the population or the expected frequency. q = 1-p, d = Margin of error. Z = Area under normal curve corresponding to the desired confidence level (CI).

Now for the present study, Z = 1.96 at 9.5% CI, p = 0.26 (Approximate' 26% of the senior staff nurses possess knowledge on pre-operative management of appendicitis), q = 1 - 0.26 = 0.74 and d = 0.05,  
 $n = 1(1.96)^2 (0.26) (0.74)] / (0.05)^2 = 295.65 = 296$

Due to availability, the total sample size taken for this study was 302.

**Sampling technique:** Purposive sampling technique was followed.

**Data collection instruments:** A partially structured questionnaire which was duly pre-tested was used to collect data from the respondents.

**Data collection procedure:** The researcher herself collected data from the senior staff nurses working in M Abdur Rahim Medical College Hospital, Dinajpur by face to face interview through a partially structured questionnaire. All efforts were made to collect data accurately. For open questions, the respondents were asked in such a manner so that they could speak freely and explain their opinion in a normal and neutral way. No leading questions were asked.

**Inclusion criteria of the respondents:** All the senior staff nurses working in M Abdur Rahim Medical College Hospital, Dinajpur during study period were included in the study.

**Exclusion criteria:** Unwilling to participate in the study.

**Data analysis:** After proper verification, data were coded and entered into the computer by using SPSS/PC programme. Data were analyzed according to the objectives of the study by using SPSS/PC+ software computer programme. Descriptive variables were explained with mean and standard deviation. Statistical significance was found by applying relevant statistical tests at appropriate probability level (p = 0.05 or p = 0.01).



## RESULTS

**Table 1: Distribution of the respondents by age**

Age in Group	Respondents	
	No	%
Up to 30 years	7	2.3
31 - 45 years	144	47.7
46+ years	151	50.0
Total	302	100.

$$X \pm SD = 44.77 \pm 6.62 \text{ years}$$

Regarding age distribution of the respondents it was found that out of 302 respondents majority (50.0%) were in the age group of 46 years and above, 47.7 % were in the age group of 31-45 years and only a very few 2.3% were in the age group of up to 30 years. The mean age of the respondents was  $44.77 \pm 6.62$  years.

**Table 2: Distribution of the respondents by educational status**

Educational Status	Respondents	
	No	%
Diploma in Nursing	95	31.5
B.Sc in Nursing	157	52.0
MPH/ M.Sc	50	16.6
Total	302	100.

Regarding educational status it was revealed that out of 302 respondents majority (52.0%) had B.Sc in nursing, 31.5% had diploma in nursing and 16.6% had MPH/ M.Sc degree.

**Table 3: Distribution of the respondents by length of services**

Length of Service	Respondents	
	No	%
Up to 5 years	29	9.6
11 - 15 years	32	10.6
16+ years	241	79.8
Total	302	100.

$$X \pm SD = 20.32 \pm 8.19 \text{ years}$$

Regarding length of service it was observed that 79.8%, 10.6% and 9.6% of the nurse had length of service of more than 16 years, 11-15 years and up to 5 years respectively. The mean service length of the respondents was  $20.32 \pm 8.19$  years.

**Table 4: Distribution of the respondents by monthly family income**

Monthly family income	Respondents	
	No	%
Taka up to 30,000	189	62.6
Taka 30,001+	113	37.4
Total	302	100.

$$X \pm SD = \text{BDT } 33,440.40 \pm 10,175.93$$

Table 4 showed that most (62.6%) of the respondents' monthly family income was BDT up to 30,000 and 37.4% had income Taka >30,000. The average monthly family income was BDT  $33,440.40 \pm 10,175.93$ .

**Table 5: Distribution of the respondents by their position in service**

Position in service	Respondents	
	No	%
SSN	266	88.1
Supervisor	7	2.3
Instructor	25	8.3
Superintendent	4	1.3
Total	302	100.

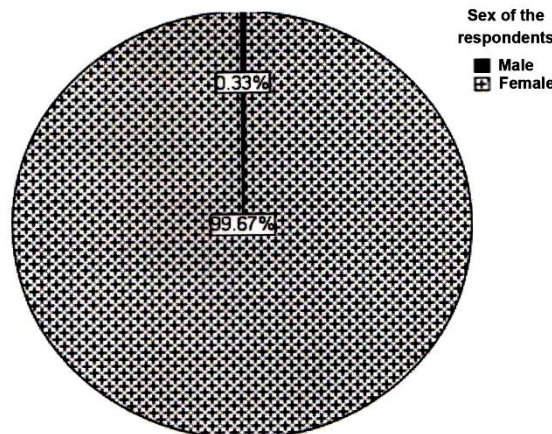
Above table showed that most (88.1%) of the respondents were senior staff nurses followed by instructor, supervisor and superintendent, which compromised of 8.3%, 2.3% and only 1.3% respectively.

**Table 6: Distribution of the respondents by present working place**

Present working place	Respondents	
	No	%
Medicine ward	79	26.2
Surgery ward	40	13.2
Gynae ward	44	14.6
O.T	55	18.2
Others	84	27.8
Total	302	100.

From the table 6, it was found that 26.2% of the respondents were in medicine ward, 18.2% in O.T, 14.6% in Gynae ward, 13.2% in surgery ward and 27.8% of the respondents had other present working place.

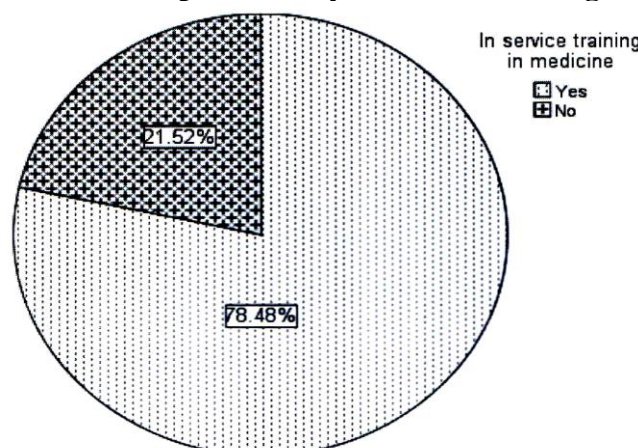
**Distribution of the respondents by sex**



**Figure 1: Distribution of the respondents by sex**

It was found that almost all (99.67%) the respondents were female and only a very few (0.33%) were male.

**Distribution of the respondents by in service training in medicine**



**Figure 2: Distribution of the respondents by in service training in medicine**

It was found that majority (78.8%) of the respondents had in service training and only 21.52% had no in-service training.

**Table 7: Distribution of the respondents by knowledge on cause of acute meningitis**

knowledge on cause of acute meningitis	Respondents	
	No	%
Tick borne meningoencephalitis, measles, vricella-zoster virus	292	96.7
Don't know	10	3.3
Total	302	100.

Regarding knowledge on cause of acute meningitis it was observed that most (96.7%) of the respondents knew as tick borne meningoencephalitis, measles, vricella-zoster virus and only 3.3% didn't know about cause of meningitis.

**Table 8: Distribution of the respondents by knowledge on agents responsible for meningitis**

knowledge on agents responsible for viral meningitis	Respondents	
	No	%
Listeria monosytogens, neisseria meningitides, tuberculosis, rickettsia, prowazekii	292	96.7
Others	10	3.3
Total	302	100.

Above table showed that most (96.7%) of the respondents knew the agents like Listeria monosytogens, neisseria meningitides, tuberculosis, rickettsia, prowazekii, which were responsible for viral meningitis and only 3.3% knew other elements as agents of meningitis.

**Table 9: Distribution of the respondents by knowledge on agents responsible for protozoal meningitis**

Knowledge on agents responsible for protozoal meningitis	Respondents	
	No	%
Primary meningoencephalitis eg: Naegleria, fowleri, sappinia, diploidea, Tryupanosoma	292	96.7
Don't know	10	3.3
Total	302	100.

Above table showed that most (96.7%) of the respondents knew the agents responsible for protozoal meningitis were Primary meningoencephalitis eg: Naegleria, fowleri, sappinia, diploidea, Tryupanosoma and only 3.3% didn't know about the agent.

**Table 10: Distribution of the respondents by knowledge on complications of meningitis**

Knowledge on complications of meningitis	Respondents	
	No	%
Disseminated intravascular coagulation cerebral palsy	301	99.7
Others	1	0.3
Total	302	100.

Above table showed that most (99.7%) of the respondents knew about complications of meningitis as disseminated intravascular coagulation cerebral palsy and only 0.3% knew other things as complications.

**Table 11: Distribution of the respondents by knowledge risk group of meningitis**

Knowledge risk group of meningitis	Respondents	
	No	%
Children	301	99.7
Others	1	0.3
Total	302	100.

It was revealed that most (99.7%) of the respondents knew children were the risk group of meningitis and only 0.3% knew others as risk group.

**Table 12: Distribution of the respondents by knowledge on most common organism that cause acute meningitis**

Knowledge on most common organism that cause acute meningitis	Respondents	
	No	%
Streptococcus pneumonia, neisseria, meningitides and haemophilus influenza	299	99.00
Others	3	1.0
Total	302	100.

It was found that majority (99.0%) of the respondents knew most common organism that cause acute as Streptococcus pneumonia, neisseria, meningitides and haemophilus influenza and remaining 1.0% knew other factors as most common organism.

**Table 13: Distribution of the respondents by knowledge on prognosis of meningitis**

Knowledge on prognosis of meningitis	Respondents	
	No	%
Disease associated with high rates of mortality and severe morbidity	298	98.7
Don't know	4	1.3
Total	302	100.

It was found that majority (98.7%) of the respondents knew about prognosis of meningitis and remaining 1.3% didn't know.

**Table 14: Relationship between age group and knowledge on cause of acute meningitis**

Age group	Knowledge on cause of acute meningitis		
	Tick borne meningoencephalitis, measles, vricella-zoster virus	Don't know	Total
Up to 30 years	7 (100.0%)	0(0.0%)	7 (2.3%)
31 – 45 years	134 (93.1%)	10 (6.9%)	144 (47.7%)
46+ years	151 (100.0%)	0 (0.0%)	151 (50%)
Total	292 (96.7%)	10 (3.3%)	302 (100%)

$$X^2 = 11.384, df = 2, p < 0.01$$

Above table showed the relationship between age group of the respondents and their knowledge on cause of acute meningitis. Among the respondents aged 30 years or below (2.3%), all of them (100%) had correct knowledge. Among the respondents in the age group of 31 to 45 years (47.7%), 93.1% had correct knowledge and among the respondents aged 46 years or above (50.0%), all of them (100%) had correct knowledge. The difference of knowledge on cause of acute meningitis among the different age groups of the respondents was found statistically significant ( $p < 0.01$ ).

**Table 15: Relationship between age group and knowledge on agents responsible for meningitis**

Age group	Knowledge on cause of acute meningitis		
	Listeria monosytogens, neisseria meningitides, tuberculosis, rickettsia, prowazekii	Others	Total
Up to 30 years	7 (100.0%)	0(0.0%)	7 (2.3%)
31 – 45 years	134 (93.1%)	10 (6.9%)	144 (47.7%)
46+ years	151 (100.0%)	0 (0.0%)	151 (50%)
Total	292 (96.7%)	10 (3.3%)	302 (100%)

$$X^2 = 11.384, df = 2, p < 0.01$$

Above table showed the relationship between age group of the respondents and their knowledge on agent responsible for meningitis. Among the respondents aged 30 years or below (2.3%), all of them (100%) had correct knowledge. Among the respondents in the age group of 31 to 45 years (47.7%), 93.1% had correct



knowledge and among the respondents aged 46 years or above (50.0%), all of them (100%) had correct knowledge. The difference of knowledge on cause of acute meningitis among the different age groups of the respondents was found statistically significant ( $p < 0.01$ ).

**Table 16: Relationship between professional educational qualification and knowledge on cause of acute meningitis**

Professional educational qualification	knowledge on cause of acute meningitis		
	Tick borne meningoencephalitis, measles, vricella-zoster virus	Don't know	Total
Diploma in Nursing	85 (89.5%)	10 (10.5%)	93 (31.5%)
B.Sc in Nursing	157 (100.0%)	0 (0.0%)	157 (52.0%)
MPH/ M.Sc	50 (100.0%)	0 (0.0%)	50 (16.6%)
Total	292 (96.7%)	10 (3.3%)	302 (100%)

$$X^2 = 22.536, df = 2, p < 0.01$$

Above table showed the relationship between professional educational qualification of the respondents and their knowledge on cause of acute meningitis. Among the respondents of diploma in nursing (31.5%) had knowledge on tick borne meningoencephalitis, measles, vricella-zoster virus (89.5%). Among the respondents of B.Sc in nursing (52.02%) 100% had correct knowledge. The difference of knowledge on cause of acute meningitis among the different educational qualification of the respondents was found statistically significant ( $p < 0.01$ ).

**Table 17: Relationship between professional educational qualification and knowledge on agent responsible for meningitis**

Professional educational qualification	knowledge on cause of acute meningitis		
	Listeria monosytogens, neisseria meningitides, tuberculosis, rickettsia, prowazekii	Others	Total
Diploma in Nursing	85 (89.5%)	10 (10.5%)	93 (31.5%)
B.Sc in Nursing	157 (100.0%)	0 (0.0%)	157 (52.0%)
MPH/ M.Sc	50 (100.0%)	0 (0.0%)	50 (16.6%)
Total	292 (96.7%)	10 (3.3%)	302 (100%)

$$X^2 = 22.536, df = 2, p < 0.01$$

Above table showed the relationship between professional educational qualification of the respondents and their knowledge on agent responsible for meningitis. Among the respondents of diploma in nursing (31.5%) had knowledge on listeria monosytogens, neisseria meningitides, tuberculosis, rickettsia, prowazekii (89.5%). Among the respondents of B.Sc in nursing (52.02%) 100% had correct knowledge. Among the respondents of MPH/ M.Sc (16.6%) 100% had the correct knowledge. The difference of knowledge on cause of acute meningitis among the different educational qualification of the respondents was found statistically significant ( $p < 0.01$ ).

## DISCUSSION

This was a cross sectional type of descriptive study which was carried out with a view to assess the knowledge and practice on meningitis and its management of the senior staff nurses working in M Abdur Rahim Medical College Hospital, Dinajpur. The sample size was 302 which was selected purposively. The present study provided some important basic information about the nurses' knowledge on management of meningitis. Present study showed that out of 300 respondents majority (50.0%) were in the age group of 46 years and above. 47.7 % were in the age group of 31-45 years and only a very few 2.3% were in the age group of up to 30 years. The mean age of the respondents was  $44.77 \pm 6.617$  years (Table No. 1). In another study near half of the participants was found in the age group of 26-30 years.

Majority of the respondents (52.0%) had BSc in nursing. 31.5% had diploma in nursing and 16.6% had MPH/MSc degree (Table No.2). The educational level should be improved among the nurses through motivation. Regarding length of service it was observed that 79.8%, 10.6% and 9.6% of the nurses had length of service of more than 16 years, 11-15 years and up to 5 years respectively. The mean service length of the respondents was  $20.32 \pm 8.19$  years (Table no. 03). The average time of their experience in medicine ward in another study varied from 14 and 18 years, the longest experience was 24 years and the shortest was

three.

Most (62.6%) of the respondents' monthly family income was BDT 10001-30000. The average monthly family income was BDT 33,440.40 ± 10,175.93 (Table No. 4). It was revealed that most (88.1%) of the respondents were senior staff names followed by instructor, supervisor and superintendent, which comprised of 83%, 23% and only 1.3% respectively (Table No. 5). It was found that 26.1% of the respondents were in medicine ward, 18.2% in O.T, 14.6% in Gynae ward, 13.2% in surgery ward and 27.8% of the respondents had other present working place (Table No. 6). It is a good sign that they had different knowledge and practices for the management of the patients. Regarding knowledge on cause of acute meningitis it was observed that most (96.7%) of the respondents knew as tick borne meningoencephalitis, measles, varicella-zoster virus and only 3.3% didn't know about cause of acute meningitis (Table No. 7). It indicates that the knowledge of the nurses about meningitis were much appreciating. It was revealed that most (96.7%) of the respondents knew about agents like *Listeria monosytogens*, *neisseria meningitidis*, tuberculosis, rickettsia, *proWazekii* were responsible for viral meningitis and only 3.3% knew other elements as agents of meningitis (Table No. 8). Most (96.7%) of the respondents knew agents responsible for protozoal meningitis were Primary meningoencephalitis eg: *Naegleria fowleri*, *sappinia diploidea*, *Trypanosoma* and only 3.3% didn't know about the agents (Table No. 9). Most (99.7%) of the respondents knew about complications of meningitis as disseminated intravascular coagulation, cerebral palsy and only 0.3% knew other things as complications (Table No. 10). In another study the knowledge on complication is almost same of the nurses.

It was revealed that most (99.7%) of the respondents knew children were the risk group of meningitis and only 0.3% knew others as risk group (Table No. 11). It was found that majority (99.0%) of the respondents knew most common organisms that cause acute meningitis as *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae* and remaining 1.0% knew other factors as most common organisms (Table No. 12). It was found that majority (98.7%) of the respondents knew about prognosis of meningitis and remaining 1.3% didn't know (Table No. 13). It was found that 1005 of the respondents had knowledge on causative organism of meningitis, clinical features of meningitis, mumps as one of relatively common viral cause of meningitis, CSF for study, CBC, CT scan of brain, MRI of Brain as investigations commonly done for meningitis and broad spectrum analgesic, anti convulsant, antiviral as management of meningitis. It was found that almost all (99.67%) the respondents were female and only a very few (0.33%) were male (Fig. no. 01), majority (78.48%) of the respondents had in service training and only 21.52% had no in-service training (Fig. no. 02). There was statistically significant relationship between age group of the respondents and their knowledge on cause of acute meningitis, age group of the respondents and their knowledge on agents responsible for meningitis ( $p < 0.01$  each). The relationship of professional educational qualification of the respondents with their knowledge on cause of acute meningitis and knowledge on agents responsible for meningitis were found statistically significant ( $p < 0.01$  each).

## CONCLUSION

This was a cross sectional type of descriptive study which was carried out with a view to assess the knowledge and practice on meningitis and its management of the senior staff nurses working in M Abdur Rahim Medical College Hospital, Dinajpur. The sample size was 302 which was selected purposively. The present study provided some important basic information about the nurses' knowledge on management of meningitis. Present study showed that majority (50.0%) of the respondents were in the age group of 46 years and above, 47.7% were in the age group of 31-45 years and only a very few 2.3% were in the age group of up to 30 years. The mean age of the respondents was 44.77 ± 6.62 years. Majority of the respondents (52.0%) had BSc in nursing degree, 31.5% had diploma in nursing and 16.6% had MPH/MSc degree. The educational level should be improved among the nurses through motivation.

Regarding length of service it was observed that 79.8%, 10.6% and 9.6% of the nurses had length of service of more than 16 years, 11-15 years and up to 5 years respectively. The mean service length of the respondents was 20.32 ± 8.19 years. Most (62.6%) of the respondents' monthly family income was BDT 10001-30000. The average monthly family income was BDT 33440.40 ± 10175.93. It was revealed that most (88.1%) of the respondents were senior staff nurses followed by instructor, supervisor and superintendent, which comprised of 83%, 23% and only 1.3% respectively. It was found that 26.2% of the respondents were in medicine ward, 18.2% in O.T, 14.6% in Gynae ward, 13.2% in surgery ward and 27.8% of the respondents had other present working place. Regarding knowledge on cause of acute

meningitis it was observed that most (96.7%) of the respondents knew as tick borne meningoencephalitis, measles, varicella-zoster virus and only 3.3% didn't know about cause of acute meningitis. It was revealed that most (96.7%) of the respondents knew about agents like *Listeria monosytogens*, *neisseria meningitidis*, tuberculosis, rickettsia, *pro w azekii* were responsible for viral meningitis and only 3.3% knew other elements as agents of meningitis.

Most (96.7%) of the respondents knew agents responsible for protozoal meningitis were Primary meningoencephalitis eg: *Naegleria fowleri*, *sappinia diploidea*, *Trypanosoma* and only 3.3% didn't know about the agents. Most (99.7%) of the respondents knew about complications of meningitis as disseminated intravascular coagulation, cerebral palsy and only 0.3% knew other things as complications. It was revealed that most (99.7%) of the respondents knew children were the risk group of meningitis and only 0.3% knew others as risk group. It was found that majority (99.0%) of the respondents knew most common organisms that cause acute meningitis as *Streptococcus pneumoniae*, *Neisseria meningitidis* and *Haemophilus influenzae* and remaining 1.0% knew other factors as most common organisms. It was found that majority (98.7%) of the respondents knew about prognosis of meningitis and remaining 1.3% didn't know. It was found that almost all (99.67%) the respondents were female and only a very few (0.33%) were male, majority (78.48%) of the respondents had in service training and only 21.52% had no in-service training. There was statistically significant relationship between age group of the respondents and their knowledge on cause of acute meningitis, age group of the respondents and their knowledge on agents responsible for meningitis, professional educational qualification of the respondents and their knowledge on cause of acute meningitis and professional educational qualification of the respondents and their knowledge on agents responsible for meningitis ( $p < 0.01$ ).

## RECOMMENDATIONS

In the light of the present study findings, I would like to make the following recommendations:

1. Training program on meningitis for the nurses should be arranged in regular basis to update their knowledge.
2. Hospital based patient education program should be strengthened about meningitis.
3. There is need for continuing medical education program aimed at improving knowledge of nurses.

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