A Study to Assess the Effectiveness of Structured Teaching Programme on Knowledge Regarding Adenovirus Infection in Children Among Nursing Students in Selected Nursing Colleges, Bangalore

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Abstract: <u>*Introduction:*</u> *Adenovirus (AdV) infections occur worldwide and are associated with sporadic as well as institutional and community outbreaks and epidemics. Most infections occur in children and are mild or asymptomatic. Typically, in Adenovirus infections result in self-limiting respiratory, gastrointestinal or ocular infections, however, Adenovirus can cause severe disseminated disease in children and immunocompromised children[1]. AdV infections are more common in young children, due to lack of humoral immunity. Epidemics of AdV infection may occur in healthy children or adults in closed or crowded settings. The disease is more severe and dissemination is more likely in patients with impaired immunity (e.g., organ transplant recipients, human immunodeficiency virus infection). Fatality rates for untreated severe AdV pneumonia or disseminated disease may exceed 50%. More than 50 serotypes of AdV have been identified. Different serotypes display different tissue tropisms that correlate with clinical manifestations of infection[2]* <u>*Methodology:*</u> *In the present study, evaluative research approach was selected; one group pre-test and post-test design was adopted. Sample size was 60 and samples were nursing students in selected Nursing Institutions, Bangalore. Samples were selected by using convenient sampling techniques. Structured knowledge questionnaire was used to collect data from the participants. Data was analyzed by both descriptive and inferential statistics.* <u>*Results:*</u> *The pre-test mean knowledge score was (10.52) and the post-test mean knowledge score was (19.40). The paired 't' test value between pre-test and post-test was 29.25 which is statistically significant at 0.05 level degree of freedom. The study reveals that there is a significant association between the knowledge level and certain demographic variables such as age, gender, religion, education, place of residence, state belongs, knowledge regarding adenovirus infection in children, source of information. Therefore, the research hypothesis is accepted.* <u>*Conclusion:*</u> *The pre-test knowledge level was deficient. The study result showed that there is increase in the knowledge level after administration structured teaching programme on knowledge regarding Adenovirus infection in children. Thus, structured teaching programme is effective in increasing the knowledge level of nursing students regarding Adenovirus infection in children.*

Keywords: Adenovirus, pre-experimental approach, Likert scale, structured teaching programme

1. Introduction

Adenoviruses most commonly cause respiratory illness. However, depending on the infecting serotype, adenoviruses may also cause conjunctivitis, gastroenteritis, cystitis, and, less commonly, neurologic illness. Respiratory illness symptoms caused by adenovirus infection range from common cold symptoms, pharyngitis, and rhinitis, to bronchitis or pneumonia. Young infants and patients with compromised immune systems are more susceptible to severe complications from adenovirus infection.[2]

An adenovirus infection can occur in a child of any age. Children ages 6 months to 2 years who are in child care are more likely to become ill with these viruses. Adenovirus infections of the digestive tract are more common in children under the age of 5. Most children have had at least one adenovirus infection by age 10. Adenoviruses are a group of viruses that cause a variety of infections, such as: Respiratory illness, such as a cold, Infection of the eye (conjunctivitis, also called pink eye) Croup, Bronchiolitis, Pneumonia.[3]

In children, adenoviruses most often cause infections in the respiratory system, but they also cause infections of the digestive tract. Respiratory infections are most common in the late winter, spring, and early summer. They can include: Runny nose, Sore throat, Fever, Severe cough, Swollen lymph nodes, Headache, Pink eye. Symptoms of a digestive tract infection may start 3 to 10 days after exposure. Symptoms usually occur in children younger than 5 years and may last 1 to 2 weeks. They can include: Watery diarrhoea that starts suddenly, Fever, Belly (abdominal) pain, Vomiting.4

Human adenovirus type 3 (HAdV-3) respiratory infections occur worldwide in both children and adults, leading to severe morbidity and mortality, particularly in the paediatric age group and especially in neonates. HAdV-3 has recently become the major agent of acute respiratory infection worldwide, being responsible for 15% to 87% of all adenoviral respiratory infections. However, despite the increased prevalence of HAdV-3 as respiratory pathogen, the diversity of hexon proteins in circulating strains remains unexplored. This study was designed to explore the variation in HVRs of hexon among globally distributed strains of HAdV-3 as well as to discover possible relationship among them, thus possibly shedding light on the cause for the increased prevalence of HAdV-3.

In this study, for the first time they analysed the hexon proteins of all 248 available strains of HAdV-3 from the NCBI database and compared them with those of the HAdV-3 prototype (GB stain). We found that the HVRs of HAdV-3 strains circulating worldwide were highly heterogeneous and have been mutating continuously since -their original

isolation. Based on their immense heterogeneity, the strains can be categorized into 25 hexon variants (3Hv-1 to 3Hv-25), 4 of which (3Hv-1 to 3Hv-4) comprises 80% of the strains. This heterogeneity may explain why HAdV-3 has become the most prevalent HAdVs type worldwide. The heterogeneity of hexon proteins also shows that the development of a vaccine against HAdV-3 might be challenging. The data on hexon variants provided here may be useful for the future epidemiological study of HAdV-3 infection.[5]

An evaluative research approach with pre-experimental design was used to assess the effectiveness of structure teaching programme on knowledge regarding prevention of childhood accidents among mothers of under five children at Piparia, Vadodara. 50 mothers from Piparia village were selected for data collection by non - probability convenient sampling. The study findings revealed that structured teaching programme was highly effective in improving knowledge of mothers regarding childhood accidents. [5]

A cross-sectional study was conducted in Mwanza, Tanzania from June to August 2017 involving 137 children less than two years of age admitted with acute diarrhoea in the health facilities located. Sociodemographic and other relevant information were collected using standardized rotavirus surveillance tool adopted from WHO. Stool specimens were collected and tested for human adenovirus antigen using immunochromatographic tests. The median age of enrolled children was 12 months. The result showed the prevalence of human adenovirus was found to be 46 (95%). By multivariable logistic regression analysis, only prolonged duration of diarrhoea was found to predict human adenovirus infection among rotavirus-vaccinated children with acute diarrhoea. A significant proportion of rotavirus-vaccinated children with prolonged acute diarrhoea have adenovirus infection. The study concluded that there is a need to consider other viral pathogens as potential cause of diarrhoea especially in this post rotavirus vaccination period.[6]

A study was conducted in Beijing,china. Nasopharyngeal aspirates (NPA) were collected from hospitalized children with RTIs from April 2017 to March 2018. The result showed HAdV was detected in 72 (5.64%) of the 1276 NPA specimens, with most (86.11%, 62/72) HAdV-positives cases detected among children < 6 years of age. HAdV-B3 (56.06%, 37/66) and HAdV-C2 (19.70%, 13/66) were the most frequent. Of the 72 HAdV-infected cases, 27 (37.50%) were co-infected with other respiratory viruses, most commonly parainfluenza virus (12.50%, 9/72) and rhinovirus (9.72%, 7/72). The main clinical symptoms in the HAdV-infected patients were fever and cough, and 62 (86.11%, 62/72) were diagnosed with pneumonia. The study concluded that HAdV prevalence is related to age and season. HAdV-B and HAdV-C circulated simultaneously among the hospitalized children with RTIs in Beijing, and HAdV-B type 3 and HAdV-C type 2 were the most frequent.[7]

Under-five children are more prone to get adenovirus infection and B.Sc. Nursing students has to be aware of the prevalence, symptoms, treatment, management of this infection, guided by all the above facts researcher felt the need to assess the knowledge regarding adenovirus infection using a structured teaching program.

2. Objectives

1) To assess the pre-test knowledge level regarding adenovirus infection in children among nursing students in selected nursing college, Bangalore.
2) To evaluate the effectiveness of structured teaching programme on knowledge regarding adenovirus infection in children among nursing students in selected nursing college, Bangalore.
3) To find out the association between the post-test knowledge scores regarding adenovirus infection in children with selected demographic variables among nursing students in selected nursing college, Bangalore.

Hypothesis
H_1: There was a significant difference between pre-test and post-test knowledge scores regarding adenovirus infection in children among nursing students in selected nursing colleges, Bangalore.
H_2: There was significant association between the post-test knowledge scores regarding adenovirus infection in children with selected demographic variables among nursing students in selected nursing colleges, Bangalore.

Conceptual Framework: The conceptual framework selected for the present study iwas based on Ludwing Von Bertanlanffy's modified general system theory. According to her general system theory is a science of wholeness and its purpose is to unite scientific thinking on discipline and which provides a framework for analysis the whole of any given system

3. Materials and Methods

To accomplish the objectives of the study, one group pre-test post -test design was adopted. In this study target population were nursing students. In this study, sample size consisted of 60 nursing students studying in a selected nursing college, Bangalore. For the present study, convenient sampling technique was used to select 60 nursing students. Structured knowledge questionnaire consists of two parts. The instrument was developed in English after an extensive review of literature and expert's opinion.

Inclusive criteria: Nursing students who:
- are willing to participate in the study
- are available at the time of data collection.
- both male and female students.

Exclusive criteria
- Students who are not available at the time of study.
- Students who don't have interest.

4. Results

Section 1: Demographic Characteristics of Respondents

Table: Classification of Respondents by Demographic Characteristics, N=60

Characteristics	Category	Respondents	
		Number	Percent (%)
Age (years)	19-20	9	15
	21-22	21	35
	22-23	19	31.6
	24 and above	11	18.3
Gender	Male	25	41.7
	Female	35	58.3
Religion	Christian	54	90.0
	Muslim	2	3.3
	Hindu	4	6.7
Place of Residence	Rural	10	16.7
	Urban	50	83.3
Education	1st year	6	10
	2nd year	24	40
	3rd year	21	35
	4th year	9	15
State belonging	Karnataka	4	6
	Tamil Nadu	15	25
	Andra Pradesh	6	10
	Others	35	58.3
Previous knowledge on adenovirus infection	Yes	54	75.0
	No	6	25.0
Source of information	Teachers	37	82.2
	Parents	0	0
	Friends	4	8.8
	Mass media	4	8.8

The above figure indicates that among 60 respondents, the respondents **15%** (9) were 19-20 years of age, **35%** (21) were 21-22 years of age, **31.6%** (19) were 22-23 years of age and (11)**18.3%** were 24 and above age.

Overall and Aspect wise Pre-test and Post-test Knowledge Scores on adenovirus infection
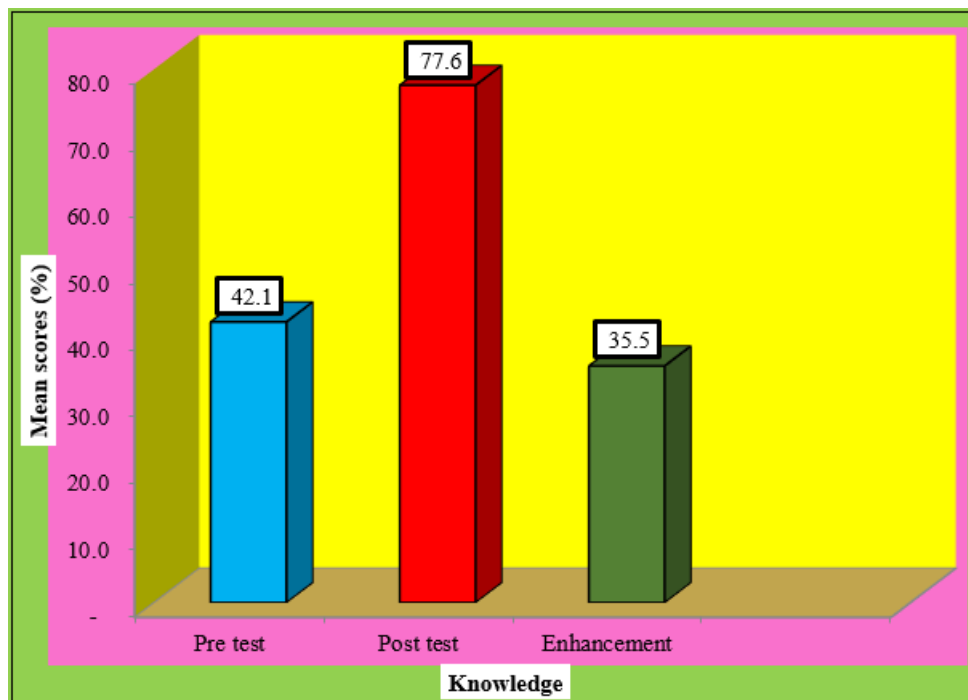
The above figure indicates that the mean pre-test score is 42.1% and the mean post-test knowledge scores is 77.6% and the enhancement is 35.5%.

Section 2: Association between Demographic variables and Post-test Knowledge level on adenovirus infection.

Association between Demographic variables and Post-test Knowledge level on adenovirus infection, N=60

Demographic Variables	Category	Sample	Knowledge Level				χ^2 Value	P Value
			Moderate		Adequate			
			N	%	N	%		
Age (years)	19-20	9	3	33.3	6	66.6	4.21*	P<0.05 (3.841)
	21-22	21	8	38.0	13	61.9		
	22-23	19	6	31.5	13	68.4		
	24 and above	11	2	18.1	9	81.8		
Gender	Male	25	16	64.0	9	36.0	6.25*	P<0.05 (3.841)
	Female	35	11	31.4	24	68.6		
Religion	Christian	54	25	46.3	29	53.7	1.71 NS	P>0.05 (5.991)
	Muslim	2	0	0.0	2	100.0		
	Hindu	4	2	50.0	2	50.0		
Education	1st year	6	3	50.0	3	50.0	4.36*	P<0.05 (3.841)
	2nd year	24	6	25.0	18	75.0		
	3rd year	21	7	33.3	14	66.6		
	4th year	9	2	22.2	7	77.7		
State belonging	Karnataka	4	1	25	3	75	1.31 NS	P>0.05 (5.991)
	Tamil Nadu	15	4	26.6	11	73.3		
	Andra Pradesh	6	3	50.0	3	50.0		
	Others	35	15	42.8	20	57.1		
Place of Residence	Rural	10	1	10.0	9	90.0	5.94*	P<0.05 (3.841)
	Urban	50	26	52.0	24	48.0		
Previous knowledge on adenovirus infection	Yes	54	12	22.2	42	77.7	4.95*	P<0.05 (3.841)
	No	6	2	33.3	4	66.6		
Source of information	Teachers	37	8	50.0	8	50.0	0.53 NS	P>0.05 (7.815)
	Parents	0	0	0	0	0		
	Friends	4	5	50.0	5	50.0		
	Mass media	4	5	38.5	8	61.5		

* Significant at 5% Level,
NS: Non-significant

The above figure indicates that out of 60 respondents, 33.3% of are with belong to between 19-20 years of age and 38% of belong to between 20-21 years of age, 31.5% of belongs to 22-23 years of age and 18.1 % of belongs to 24 years & above had moderate knowledge on adenovirus infection; 66.6% of age is 19-20 years, 61.9% of age is 21-22 years, 68.4% of age is 22-23 years and 81.8% of age is 24 years and above had adequate knowledge on adenovirus infection.

Section I: Description of socio-demographic variables in frequency and percentage

- The majority of the respondents 15% (9) were 19-20 years of age, 35% (21) were 21-22 years of age, 31.6% (19) were 22-23 years of age and 18.3% were 24 and above age.
- Regarding gender the majority of the respondents 58.3% (35) were females and the remaining 41.7% (25) were males.
- In related to religion among 60 respondents, the majority of the respondents 90% (54) belong to Christian, and the remaining 3.3% (2) belong to Muslim, and 6.7% (4) belong to Hindu.
- The respondents educational status was 1st year 10 % (6), 2nd Year 40 % (24), 3rd Year 35 % (21) and 4th Year 15 % (9).
- The majority of the respondent's state belonging was 6%*(4) were Karnataka, 25% (15) were Tamil Nadu, 10% (6) were Andra Pradesh and 58.3 % (35) were Others.
- Majority of the respondents 83.3% (50) were from urban areas and the remaining 16.7% (10) were from rural areas.
- The majority of the respondents 75% (25) were having previous knowledge on adenovirus infection and the remaining 45% (15) were not having previous knowledge on adenovirus infection.
- The majority of the respondents 82.2% (37) received information on adenovirus infection from the Teachers, and 0%(0) from the parents and 8.8% (4) from the mass media and Friends.

Section II: Analysis and interpretation of Pre-test knowledge level of nursing students regarding adenovirus infection in children.

- Majority 66.7% (40) of respondents had inadequate knowledge regarding adenovirus infection in children in the pre- test, the remaining 33.3% (20) had moderately adequate knowledge and none of the respondents had adequate knowledge regarding adenovirus infection in children.
- Aspect wise pre-test mean knowledge score regarding Introduction, Definition, Morphology and Classification about adenovirus infection was 2.27(37.8%) Pathogenesis, Incubation period and Risk factors of adenovirus infection were 0.60(60%), Epidemiology and Mode of transmission of adenovirus infection were 1.07(35.6%), Clinical manifestation Diagnostic Evaluation of adenovirus infection were 2.40(48%), Management, Prevention and Complications on adenovirus infection were 4.18(41.8%) respectively.

Section III: Analysis and interpretation of aspect wise mean Pre-test and post-test knowledge score of nursing students regarding adenovirus infection in children.

- majority 55% (33) had adequate knowledge, 45% (27) had moderate knowledge and none of them had inadequate knowledge in the post test.

- Aspect wise Post-test Mean Knowledge scores. The mean knowledge score in Introduction, Definition, Morphology and Classification of adenovirus infection was 5.12(85.3%), Pathogenesis, Incubation period and Risk factors was 0.93(93.3%), Epidemiology and Mode of transmission of adenovirus infection were 2.12(70.6%), Clinical manifestation Diagnostic Evaluation of adenovirus infection are 3.80(76%) and Management, Prevention and Complications of adenovirus infection was 7.43(74.3%). The total mean post-test knowledge scores of respondents regarding adenovirus infection was 19.40(77.6%) and with standard deviation 2.1(8.4%) indicates adequate knowledge.

Section IV: Analysis and interpretation of effectiveness of structured teaching programme by comparing mean pre - test and post- test knowledge scores regarding adenovirus infection in children among nursing students.

- The pre-test and post-test mean knowledge score of respondents on water recreational illness. The findings revealed that the mean post-test knowledge scores was 77.6%, which is significantly higher than the pre-test score of 42.1% as observed. Further, "t" value of pre-test and post-test knowledge level of the sample was found to be significant at 5% level (t=29.25*). However, the findings revealed that the structured teaching programme on adenovirus infection was effective strategy as by statistician result.

Section V: Analysis and interpretation of association between the mean post-test knowledge scores of nursing students regarding adenovirus infection in children with their selected socio-demographic variables.

- Indicates association between demographic variables and post-test knowledge score. The post-test knowledge level on adenovirus infection in children is significant at 0.05 level to certain demographic variables like previous knowledge (4.95*) and other variables like age (4.21*), gender (6.25*), religion (1.71), place of residence (5.94*), education 4.36*), state belongs (1.31) and source of information (0.53) are non-significant at 0.05 level.

Ethical Consideration
The proposed study was conducted after the approval of research ethical committee members of SEA College of Nursing. Prior permission was obtained from the principal of selected colleges, Bangalore for conducting the study. Consent from each subject was obtained before starting data collection. Assurance was given to them that anonymity of each individual would be maintained.

5. Conclusion

The focus of this study was to evaluate the effectiveness of structured teaching programme on knowledge regarding adenovirus infection in children among nursing students in selected nursing colleges, Bangalore

6. Implications of the Study

The findings of the study can be used in the following areas of nursing profession.

1) **Nursing Practice: Several** implications can be drawn from the present study for nursing practice.
- The present study revealed that nursing students had inadequate knowledge, so that concerted efforts must be made by the students to increase knowledge regarding adenovirus infection in children. The expected role of the professional nurse emphasizes those activities, which improves the knowledge among nursing students.
- The expected role of the professional nurses emphasizes those activities, which improves the knowledge among degree students regarding adenovirus infection in children.
- Nurses act as facilitator for the degree students to improve the knowledge level of adenovirus infection in children.

2) **Nursing Education:** Nursing education is to bring changes in the behaviour of people so as to prepare them to play their roles effectively as an individual and as a good responsible citizen.
- Nursing education should emphasize more on preparing prospective nurses to impart health education. This can be best done by equipping the nursing curriculum with knowledge regarding dissemination of health information using various methods of educational technology.
- As a nurse educator, there are abundant opportunities for nursing professionals to educate the nursing students.
- The study emphasizes significance of in-service education regarding adenovirus infection in children.

3) **Nursing Administration: Nursing administration is to organize and direct human and material resources**
- The nursing administrator can take part in developing protocols, regarding the health education programmed related to Adenovirus infection in children.
- The nursing administrator can mobilize the available resource personnel to impart the knowledge on Adenovirus infection in children.
- The nurse administrators should encourage innovative ideas in the preparation of appropriate teaching material. She should organize sufficient manpower; money and material for disseminating health information.

4) **Nursing Research:** Nursing research is to explore new solution and remedies to overcome the health-related problems.
- This study helps nurse researchers to educate the nursing students by providing evidence to help in identifying Adenovirus infection in children to prevent further complications in their future life.
- Nurses should come forward to carry out studies on knowledge on Adenovirus infection in children among nursing students.

Limitations of the Study
- The study was conducted only among selected BSc nursing students.
- The study was confined to 60 students of selected nursing college which limits generalization.
- The investigator developed the tool for data collection as non-standardized tool could be located. So, the limitation involved is the use of constructed tools.

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