Original Research Article

Impact of Instructional module on knowledge & practice related to use of personal protective equipment's for prevention of Covid-19 infection among Student of selected nursing college of Kashmir

ABSTRACT

Background: Covid19 has affected people all over the world especially health care workers who are constantly exposed to this virus while providing services to their clients. Health care workers act as carriers for the transmission of pathogens between patients & other health team members. This can be prevented by adopting proper infection control measures & techniques while rendering services. It can only be achieved when there is an up-gradation of knowledge & practice in health care workers especially nurses and nursing students as they are the only members of the health team who work round the clock with patients. They need to be up to date regarding infection prevention measures like the use of personal protective equipment's.

Methods: A pre-experimental one group pre-test post-test design was adopted for the study. 60 B.Sc. Nursing students from SMMCNMT, IUST, Awantipora, Kashmir and Institute of Nursing, South Campus, University of Kashmir were selected by Convenient Sampling technique. A standardized questionnaire and observational checklist was used to collect the data. Descriptive & Inferential statistics was used to analyze the data.

Results: Study reveals that all the study subjects (60) belong to the age group (18-20). Majority 35(58.3%) subjects were females and 25(41.7%) subjects are males; 39 (65%) of subjects were from rural area and 21(35%) subjects were from urban area; 20(33.3%) of study subjects were selected from B.Sc. Nursing first year; 20(33.3%) of study subjects were from BSc nursing 2nd year and 20 (33.3%) were from 3rd year. Sources of information to study subjects regarding personal protective equipment's include teachers (48.3%), family (16%), health personnel (10%) and electronic media (8.3%). Pre-test knowledge score revealed that 6.7% of the subjects had inadequate knowledge, 93.3% subjects had moderate knowledge while only 0% subjects had adequate knowledge regarding use of PPE's. Pretest practice score revealed that 8.3% of subjects had poor practice, 78.3% of subjects had average practice and 13.3% of subjects had good

practice regarding the use of PPE's. Post-test knowledge score revealed that 0% subjects had inadequate knowledge, 13.3% subjects had moderate knowledge and 86.7% subjects had adequate knowledge regarding the use of PPE's. Post-test practice score revealed that 0% subjects had poor practice, 15% subjects had average practice and 85% subjects had good practice regarding the use of PPE's. This indicates that the mean post-test knowledge scores i.e. 23.47(78.20%) is higher than the mean pretest knowledge scores i.e. 13.72(45.7%). The obtained value of t is 45.402 at $p<0.05$ level of significance. The mean posttest practice scores i.e. 9.93(82.80) is higher than the mean pretest practice scores i.e. 6.88(57.40%). The obtained value of t is 27.722 at $p<0.01$ level of significance.

Conclusion: The results revealed that Instructional Module was highly effective as there was significant increase in the post-test knowledge and practice scores among the B.Sc. Nursing students of SMMCNMT, IUST Awantipora, Kashmir and Institute of Nursing, South Campus, University of Kashmir.

Keywords: Impact, Instructional Module, Personal Protective Equipment's

Introduction:

Covid-19 is a severe respiratory syndrome that is caused by Coronavirus 2 (SARS-COV-2). It was first recognized in Wuhan, China in Dec. 2019 & was declared a pandemic by WHO on 11th March 2020(1). Since the inception of this pandemic globally, more than 17,000 health care workers have lost their lives due to Covid-19 and its associated complications (2)(3). To disintegrate the spread of the virus, international recommendations principally focused on the appropriate use of personal protective equipment (PPEs)(4)(5).

Firstly transmission of Covid-19 to health care workers likely occurred in Solano County, California in February 2020. At that moment, PPE precautions were not yet settled, so none of the health care workers wore PPE for Covid 19 protection. As a consequence of that, 121 health care workers were having a high, medium, or low risk of infection (6). So it is clear that health care workers are at the highest risk of exposure to Covid-19 while dealing with patients affected by Covid-19 in all the health care settings (7). The way they have to care for their patients involves close contact with blood and body fluids. So, they need appropriate protection to protect themselves from such hazards and this protection is provided only by Personal Protective

Equipment's (8). World Health Organization defines Personal Protective Equipment's as that equipment's that prevent and minimize the exposure of various biological, chemical radiological, electrical, and mechanical hazards. Personal Protective Equipment's protect health care workers from pathogens and hospital-acquired infections (HAI) at health care settings (9).

By caring for Covid-19 patients, health care workers act as frontline warriors in this pandemic. They are involved in the collection of Covid samples, carrying invasive and non-invasive procedures, dealing closely with Covid positive patients, and are at high risk of getting Covid-19 infection. Many protocols and guidelines for the prevention of Covid 19 infection are put forward by various international organizations and regulatory bodies like the Centre for Disease Control and Prevention (CDC), World Health Organization (WHO), European Agency for Safety and Health, Ministry of Health and Family Welfare (MoHFW) like Hand washing, use of alcohol-based sanitizers, maintenance of social distance and use of Personal protective equipment's. The use of Personal protective equipment's is one of the most essential elements for the prevention and control of Covid-19 infection (10).

PPE helps to secure that health care workers are safe from various hazards that they encounter in their working environment. PPE prevents health care workers from different environmental threats but no equipment is appropriate for all individuals, risks and threats: preferably, equipment must be selected and properly used according to setting and the level of threat or risk. It involves a selection of appropriate personal protective equipment according to the threat, proper sequence of donning and doffing, and proper disposal (11).

To overcome staff shortage in hospitals, on May 2021 central Government decided to rope in final year medical and nursing students for Covid-19 duty. Here arises the need of training programs for donning and doffing of Personal protective equipment's to protect these students from opportunistic infections(12).

Material & Methods:

Quantitative pre-experimental one group pre-test post-test research design was used in this study. 60 B.Sc. nursing students were selected by Stratified random sampling technique from Syed Mantaqi Memorial college of Nursing & Medical Technology, IUST Awantipora and Institute of Nursing South Campus, University of Kashmir. Data was collected in the month of November,

21 from Institute of Nursing, south campus, university of Kashmir and in December 21 from Syed Mantaqi Memorial College of nursing, IUST, Awantipora.

A standardized questionnaire of 30 questions & observation checklist of six items was used to collect data regarding use of personal protective equipment's for the prevention of Covid-19 infection.

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Categorization of knowledge score

Knowledge	Score
Good	21-30
Average	11-20
Poor	0-10

Each correct answer was given a score of 1 mark & 0 for wrong answer

Categorization of practice score

Practice	Score
Good	8-12
Average	4-8
Poor	0-4

Each correct step was given a score of 1 mark & 0 for wrong step.

The tool used for data collection was semi-standardized (13) and was validated by Dr. Tajali N Shora, Assistant Professor, Department of Community Medicine, Govt. Medical College, Anantnag.

 Ms. Rubeena Hakak, Associate Professor, Department of Microbiology, Govt. Medical College Anantnag.

 Ms. Asmat Parveen, Principal Syed Mantaqi Memorial College of Nursing & Medical Tech. IUST Awantipora. Ethical clearance was obtained from institutional ethics committee of Islamic university of science & technology, Awantipora Pulwama, under protocol number RP 031/2021. The collected data was summarized & tabulated by descriptive statistics such as mean, mean percentage, standard deviation, correlation & inferential statistics. Data analysis was done by Aneja coaching & Data analysis centre, NH1, Sahnewal Ludhiana-141120, 98884-07254.

Result and Discussion

The results were discussed under following sections.

Section A: Demographic variables.

Demographic Variables	Category	Frequency	Percentage
Age in years	Up to 18 Years	0	0.0%
	19-22 Years	60	100.0%
	23 Years or Above	0	0.0%
Gender	Male	25	41.7%
	Female	35	58.3%
Domicile	Rural	39	65.0%
	Urban	21	35.0%
Class	BSc Nursing 1st year	20	33.3%
	BSc Nursing 2nd year	20	33.3%
	BSc Nursing 3rd year	20	33.3%
Occupation of Father	Health worker	16	26.7%
	Businessman	24	40.0%
	Any other occupation	20	33.3%
Occupation of Mother	Health worker	23	38.3%
	Businesswoman	4	6.7%
	Any other occupation	33	55.0%
Previous Source of information	Family	16	26.7%
	Teachers	29	48.3%
	Health personnel	10	16.7%
	Electronic media	5	8.3%

Table 1: Frequency distribution of socio demographic variables

SECTION B:

Pre-test and Post-test knowledge & practice of subjects regarding personal protective equipment's for the prevention of Covid-19 infection.

Table 2: Pre-test level of knowledge of subjects regarding personal protective equipment's.

Pre-test knowledge	Score level	Frequency	Percentage
Inadequate	1-10	4	6.7%
Moderate	11-20	56	93.3%
Adequate	21-30	0	0%

Maximum Score=30 Minimum Score=0

Table 3: Pre-test practice related to use of personal protective equipment's for the prevention of Covid-19 infection.

Pre-test practice	Score level	Frequency	Percentage
Poor	1-4	5	8.3%
Average	5-8	47	78.3%
Good	9-12	8	13.3%

Table 4: Post-test knowledge related to use of personal protective equipment's for the prevention of Covid19 infection.

Post-test knowledge	Score level	Frequency	Percentage
Inadequate	1-10	0	0%
Moderate	11-20	8	13.3%
Adequate	21-30	52	86.7%

Table 5: Post-test practice related to use of personal protective equipment's for the prevention of Covid19 infection.

Post-test practice	Score level	Frequency	Percentage
Poor	1-4	0	0%
Average	5-8	9	15%
Good	9-12	52	85%

SECTION C:

Effectiveness of self-Instructional Module on knowledge of subjects regarding personal protective equipment's

Table 6: Comparison of pre-test & post-test knowledge of subjects.

n=60

Paired T Test	Mean± S.D.	Mean%	Range	Mean Diff.	Paired T Test	P value	Table Value at 0.05
PRETEST KNOWLEDGE	13.72±2.034	45.70	10-19	9.750	45.402 *Sig	<0.001	2.00
POSTTEST KNOWLEDGE	23.47±2.652	78.20	19-29				

** Significance Level 0.05 Maximum=30 Minimum=0

Table 7: Comparison of pre-test & post-test practice scores:

N=60

Paired t-test	Mean+-SD	Mean%	Range	Mean diff. value	Paired T test	P value	Table at 0.05
Pre-test Practice	6.88+-1.541	57.50	3-10	3.050	27.722*sig	<0.001	2.00
Post-test Practice	9.93+-1.528	82.80	6-12				

**Significance level 0.05. Maximum score=12, Minimum score=0.

SECTION D:

This section deals with the association of knowledge & practice scores with demographic variables.

Table 8: Association of pre-test & post-test knowledge score with socio- demographic variables.

Association of Pretest Knowledge Scores with Selected Socio-Demographic Variables.									
Variables	**Opts**	**ADEQUATE**	Moderate	Inadequate	**Chi Test**	**P Value**	**df**	**Table Value**	**Result**
Age in years	Up to 18 Years		0	0	NA				
	19-22 Years		56	4					
	23 Years or Above		0	0					

Gender	Male		23	2	0.122	0.726	1	3.841	Not Significant
	Female		33	2					
Domicile	Rural		37	2	0.424	0.515	1	3.841	Not Significant
	Urban		19	2					
Class	BSc Nursing 1st year		17	3	3.750	0.153	2	5.991	Not Significant
	BSc Nursing 2nd year		19	1					
	BSc Nursing 3rd year		20	0					
Occupation of Father	Health worker		16	0	3.616	0.164	2	5.991	Not Significant
	Businessman		23	1					
	Any other occupation		17	3					
Occupation of Mother	Health worker		23	0	3.506	0.173	2	5.991	Not Significant
	Businesswoman		4	0					
	Any other occupation		29	4					
Previous Source of information	Family		16	0	2.752	0.431	3	7.815	Not Significant
	Teachers		27	2					
	Health personnel		9	1					
	Electronic media		4	1					

There is no significance association between the pre-test level of knowledge scores and socio demographic variables (Age, gender, domicile, class, occupation of father, occupation of mother, previous source of information). The calculated chi-square values were less than the table value at the 0.05 level of significance

Table 9:

Association of Post-test Knowledge Scores with Selected Socio-Demographic Variables.									
Variables	**Opts**	**ADEQUATE**	**MODER**	**INADEQ..**	**Chi Test**	**P Value**	**df**	**Table Value**	**Result**
Age in years	Up to 18 Years	0	0		NA				
	19-22 Years	52	8						
	23 Years or Above	0	0						
Gender	Male	21	4		0.264	0.608	1	3.841	Not Significant
	Female	31	4						
Domicile	Rural	33	6		0.406	0.524	1	3.841	Not

	Urban	19	2						Significant
Class	BSc Nursing 1st year	15	5		5.481	0.065	2	5.991	Not Significant
	BSc Nursing 2nd year	17	3						
	BSc Nursing 3rd year	20	0						
Occupation of Father	Health worker	16	0		3.462	0.177	2	5.991	Not Significant
	Businessman	20	4						
	Any other occupation	16	4						
Occupation of Mother	Health worker	21	2		1.715	0.424	2	5.991	Not Significant
	Businesswoman	4	0						
	Any other occupation	27	6						
Previous Source of information	Family	16	0		3.422	0.331	3	7.815	Not Significant
	Teachers	24	5						
	Health personnel	8	2						
	Electronic media	4	1						

There is no significance association between the post-test level of scores and Socio demographic variables (Age, gender, domicile, class, occupation of father, occupation of

mother, previous source of information). The calculated chi-square values were less than the table value at the 0.05 level of significance

D2: Association of pre-test & post-test practice scores with selected socio- demographic variables.

Table 10:

Association of Pre- test PRACTICE Scores with Selected Socio-Demographic Variables.									
Variables	**Opts**	**POOR**	**AVERAGE**	**GOOD**	**Chi Test**	**P Value**	**df**	**Table Value**	**Result**
Age in years	Up to 18 Years	0	0	0	NA				
	19-22 Years	5	47	8					
	23 Years or Above	0	0	0					
Gender	Male	3	19	3	0.778	0.678	2	5.991	Not

	Female	2	28	5					Significant
Domicile	Rural	2	34	3	5.146	0.076	2	5.991	Not Significant
	Urban	3	13	5					
Class	BSc Nursing 1st year	3	14	3	2.148	0.709	4	9.488	Not Significant
	BSc Nursing 2nd year	1	16	3					
	BSc Nursing 3rd year	1	17	2					
Occupation of Father	Health worker	2	12	2	0.694	0.952	4	9.488	Not Significant
	Businessman	2	19	3					
	Any other occupation	1	16	3					
Occupation of Mother	Health worker	1	19	3	2.498	0.645	4	9.488	Not Significant
	Businesswoman	1	3	0					
	Any other occupation	3	25	5					
Previous Source of information	Family	2	13	1	3.231	0.779	6	12.592	Not Significant
	Teachers	3	21	5					
	Health personnel	0	9	1					
	Electronic media	0	4	1					

Table shows that there is no significance association between the pre-test practice level of scores and socio demographic variables (Age, Gender, Domicile, Class, Occupation of father, Occupation of mother, Previous source of information). The calculated chi-square values were less than the table value at the 0.05 level of significance.

Table 11:

Association of Post-test PRACTICE Scores with Selected Socio-Demographic Variables.									
Variables	**Opts**	**POOR**	**AVERAGE**	**GOOD**	**Chi Test**	**P Value**	**df**	**Table Value**	**Result**
Age in years	Up to 18 Years	0	0	0	NA				
	19-22 Years	0	9	51					
	23 Years or Above	0	0	0					
Gender	Male	0	6	19	2.723	0.099	1	3.841	Not Significant
	Female	0	3	32					
Domicile	Rural	0	5	34	0.415	0.519	1	3.841	Not Significant
	Urban	0	4	17					
Class	BSc Nursing 1st year	0	5	15	3.137	0.208	2	5.991	Not Significant
	BSc Nursing 2nd year	0	1	19					
	BSc Nursing 3rd year	0	3	17					
Occupation of Father	Health worker	0	3	13	0.294	0.863	2	5.991	Not Significant
	Businessman	0	3	21					
	Any other occupation	0	3	17					
Occupation of Mother	Health worker	0	3	20	0.383	0.826	2	5.991	Not Significant
	Businesswoman	0	1	3					
	Any other occupation	0	5	28					
Previous Source of information	Family	0	2	14	1.271	0.736	3	7.815	Not Significant
	Teachers	0	5	24					
	Health personnel	0	2	8					
	Electronic media	0	0	5					

Table shows that there is no significance association between the post-test practice level of scores and socio demographic variables (age, gender, domicile, class, occupation of father, occupation mother and previous source of information). The calculated chi-square values were less than the table value at the 0.05 level of significance.

DISCUSSION:

The present study was intended to evaluate the impact of Self-Instructional Module on knowledge & practice related to use of personal protective equipment's for the prevention of covid19 infection among the students of selected nursing colleges of Kashmir.

Data was collected by using standardized questionnaire & observation checklist from 60 B.Sc. Nursing students (30 from Syed Mantaqi Memorial college of Nursing, Awantipora & 30 from Institute of Nursing, South campus, University of Kashmir)

Major Findings of the Study:

Demographic Variables

1. All the subjects studied i.e. 60 (100%) were in the age group of 18-22.
2. Majority of the study subjects I.e. 35 (58.3%) were female students & 25 (41.7%) were male students.
3. 39 (65%) of subjects studied were from rural areas & 21(35%) of subjects were from urban areas.
4. 20 (33.3%) 0f study subjects were selected from B.Sc. Nursing 1st year, 20 (33.3%) from 2nd year & 20 (33.3%) from 3rd year.
5. In majority of study subjects, the occupation of father was business (40%) followed by other occupation (33.3%) & health workers (26.7%).
6. In majority of study subjects, the occupation of mother was any other occupation (55%) besides health worker (38.3%) & Business (6.7%).
7. Sources of information to study subjects regarding personal protective equipment's include Teachers (48.3%), Family (16%), Health personnel (10%), Electronic media (8.3%).

The findings of present study have been discussed according to the objectives as

follows;

Objective 1; To assess the pre-test knowledge score related to use of personal protective equipment's for the prevention of covid19 infection among the students of selected nursing colleges of Kashmir.

In pre-test knowledge, 6.7% of students had inadequate knowledge, 93.3% had moderate knowledge & no student had adequate knowledge.

The overall pre-test knowledge mean was 13.72 with mean% of 45.7% & standard deviation of 2.034. The highest score obtained was 19 & lowest score was 10.

Objective 2: To assess pre-test practice score related to use of personal protective equipment's for the prevention of covid19 infection among the students of selected nursing colleges of Kashmir.

In the pre-test practice, 5 (8.3%) of students had poor practice, 47(78.3%) of students had average practice & 8 (13.3%) of students had good practice.

The overall pre-test practice mean was 6.88 with mean% of 57.40% & standard deviation of 1.541. The highest score obtained was 10 & lowest score was 3.

The findings are consistent with the cross sectional study conducted by **Kamksha Garj, Anju Garewal…et al (10 April 2020)** on knowledge, attitude, and practice of donning and doffing of Personal protective equipment's among 155 health care workers during COVID-19 pandemic. Results showed that 51% of health care workers were not able to don Personal protective equipment's and 35.5% of health care workers go out of doffing area without removing gloves.

Objective 3: To assess the post-test knowledge score related to use of personal protective equipment's for the prevention of covid19 infection among the students of selected nursing colleges of Kashmir.

In post-test knowledge 0 (0%) students had inadequate knowledge, 8(13.3%) of students had moderate knowledge & 52 (86.7%) of students had adequate knowledge.

The overall post-test knowledge mean was 23.47 with mean% of 78.20% & standard deviation of 2.652. The highest score obtained was 29 & lowest score was 19.

The findings are consistent with the cross sectional study conducted by **Hossain MA, Sayeed S etal..(2020)** to assess the knowledge, attitude & practice of 393 health workers regarding personal protective equipment's for the prevention of covid19. Study results showed that 99.5% had good knowledge, 88% had positive attitude & 51.7% had good practice.

Objective 4: To assess the post-test practice score related to use of personal protective equipment's for the prevention of covid19 infection among the students of selected nursing colleges of Kashmir.

In post-test practice 0(0%) of students had poor practice, 9(15%) of students had average practice & 51(85%) of students had good practice.

The overall post-test practice mean was 9.93 with mean% of 82.80% & standard deviation of 1.528. The highest score obtained was 12 & lowest score was 6.

Objective 5: To evaluate the effectiveness of self-instructional module on knowledge & practice of students related to personal protective equipment's.

Findings related to self-instructional module of knowledge regarding use of personal protective equipment's for the prevention of covid19 infection among students of selected nursing colleges of Kashmir depicts that improvement mean% 32.50% with t value 45.402 at $p < 0.05$ level of significance which shows there is enhancement of self-instructional module.

Findings related to self-instructional module of practice regarding use of personal protective equipment's for the prevention of covid19 infection among students of selected nursing colleges of Kashmir depicts that improvement mean% 25.4% with t value 27.722 at $p < 0.01$.

Based on the results it accepts the hypothesis H1- which states that "there is significant difference between pre-test & post-test level of knowledge and practice scores".

The findings were supported by the study conducted by:

Sudhir Singh (2021) to assess the effectiveness of structured teaching program regarding donning knowledge of personal protective equipment use among 100 nursing students at

selected institute Faridabad Haryana, Mean post test score in experimental and control group was 25.72 and 13.71 respectively. The mean difference was 12.01. The t value was 59.524 which was significant at p value 0.00 which depicts the effectiveness of structured teaching program.

Objective 6: To find association between pre-test & post-test knowledge & practice with selected demographic variables (age, gender. domicile, class, occupation of father, occupation of mother, previous source of information) on using personal protective equipment's among students of selected nursing colleges of Kashmir.

Hypothesis H2 which states "there will be a significant association between post-test level of knowledge & practice scores and demographic variables" is rejected as there is no significant association between post-test level of knowledge & practice score and selected demographic variables (age, gender, domicile, class, occupation of father, occupation of mother, previous source of information

CONCLUSION:

The present study assessed the impact of self-instructional module on knowledge and practice related to use of personal protective equipments for prevention of Covid 19 infection among students of selected nursing colleges of Kashmir

The findings of the study revealed that, that overall pre-test knowledge score shows 93.3%of study subjects had moderate knowledge and 67% of study subjects had inadequate knowledge and 0% of study subjects had adequate knowledge

The overall pre-test practice score shows that 78.3% study subjects had average practice, 23.3% of study subjects had good practice and 83% of study subjects had poor practice

After, pre-test the self-instructional module was provided to the study subjects, in order to enhance their knowledge and practice related to use of personal protective equipments for prevention of Covid 19 infection.

The post-test knowledge score revealed that 86.7% of study subjects had adequate knowledge, 13.3% of study subjects had moderate knowledge and 0% of study subjects has inadequate knowledge.

The post-test practice score shows that 85% of study subjects had good practice, 15% of study subjects had adequate practice and 0 % of study subjects had poor practice

Above results revealed that the self-instructional module was very informative and it would help the study subjects to improve their knowledge and practice related to use of personal protective equipments for prevention of Covid 19 infection, Hence the selfinstructional module was competent, convenient, practicable and profitable.

Lack of adequate personal protective equipment's along with their improper use are the major contributing factors for increasing the number of Covid-positive cases all over the globe. The current study assessed the Impact of Instructional module on knowledge & practice related to us of personal protective equipment's for the prevention of Covid19 infection among the students of selected nursing colleges of Kashmir.

The results revealed that majority of nursing students had moderate level of knowledge and average level of practice in the pre-test. After pre-test, Instructional module was provided to study subjects to enhance their knowledge and practice regarding personal protective equipment's. In the post-test, both knowledge and practice of subjects was improved as evidenced by the adequate level of knowledge & good level of practice scores among majority of subjects in the post-test. Comparison of pre-test & post-test revealed that Instructional module was very informative and it helped the study subjects to improve their knowledge and practice related to personal protective equipment's. Hence the Self-Instructional module was competent, convenient, practicable and profitable.

Limitations:

- Due to limited time period Samples were selected only from two nursing colleges.
- Sample size was limited to 60 participants.

Recommendations:

1. Educational programs should be organized for nursing students and other nursing professionals regarding personal protective equipments for prevention of Covid 19 infection.

2. Special training sessions related to use of personal protective equipments should be organized for nursing students and other nursing professionals.

3. Adequate supply of personal protective equipments should be provided to nursing students during Covid 19 pandemic

4. The research studies on personal protective equipments should be conducted on regular basis

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