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Effectiveness of Online Course on Knowledge and Perception Regarding Cyber Safety among Nursing Students: Mixed Method Study

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Abstract--Introduction: The cyber space connects millions of online users across the world and increasing use of cyber space, cybercrimes also increased. Cyber safety or online safety or internet safety is to give knowledge and information about user's personal safety on internet and self-protection from computer crimes. The objectives of the study were: To determine the effectiveness of online course regarding cyber safety among Nursing students in terms of change in knowledge, To determine the level of perception and factors influencing online course regarding cyber safety as per viewed by Nursing students in experimental group and to associate the pretest knowledge regarding cyber safety among Nursing students and with their demographic variables in experimental group. Material and methods: Mixed method research approach, Explanatory Sequential mixed method was used in this study. Quantitative data was collected through online structured pretested questionnaire for both groups. Online course is administered only to experimental group. Post test was conducted after 15 days for both groups through online. Qualitative data collection through focus group discussion was done in experimental group. Each data was analyzed separately and data were interpreted together. Results: The mean post-test knowledge score (25.46 ± 3.54) of the experimental group was higher than the mean post-test knowledge score (14.57 ± 3.93) of the control group with the mean difference of 10.89. The calculated t value was ($t=17.20$) greater than the tabled value ($t_{68} = 1.99$). The data collected through interview was analyzed by using qualitative thematic analysis. Findings of the qualitative study showed that most of the

participants were having good knowledge and perception regarding the cyber safety. Conclusion: The result proved that the online course on cyber safety was effective.

Keywords---cyber safety, nursing students, online course, knowledge, perception, mixed method.

Introduction

The Internet is the major channel for education, creativity and self-expression, it is no longer only a framework and it has turned into a boundless space for data trade, informal communication, and the improvement of digital practices for human beings. so the number of internet users are increased and they are started at very young age itself moreover using a variety of devices and spending more time in online.¹

It has united individuals by empowering different types of relational correspondence, outstandingly email, texting, video conferencing, and person to person communication. In an extremely brief period, it has turned out to be troublesome for the greater part of us to envision a world without moment and persistent access to the web.² Social media use also continues to grow, with global users reaching 4.20 billion by January 2012. its equal to more than 53 percent of all the people on Earth. The number of social media users has heightened beyond 13 percent above the past 12 months. More than 490 million new users have joined social media since January 2020, equating to broad more than 1.3 million new users every day.³ In spite of the fact that individuals in all fragments of the general public utilize the Internet, particularly young people are the most continuous clients and in this manner progressively defenseless against Internet habit.⁴

The cyber space connects millions of online users across the world and increasing use of cyber space, cybercrimes also increased. Adolescents are risk taking group and use the new technologies, they are more prone to get cybercrimes. Cybercrimes are offences that committed against individual, companies or institutions by using computer, internet or mobile technology. Adolescents are vulnerable to various types of cybercrimes. Cybercrime is now a days increased more, as per the NCRB survey report the reported cases of cybercrime was 28248 at 2018, at 2019 the reported cases was 44,546. It is increased 63.5% cases of cybercrimes.⁵ As more people gain access to technology and the Internet, the need to teach users to navigate the online world responsibly and safely has become more urgent.⁶

Youthfulness is a time of the lifecycle when people are dealing with various and complex formative undertakings. These include huge changes in organic, physical, social, mental, passionate, and network relatedness spaces.⁷ reports discovered that youngsters matured more than 14 years were bound to put individual information online than those between 11 to 13 years of age. Adolescents are most commonly exposed cybercrimes are cyber threats, cyber

bullying, cyber grooming, email fraud, online transaction fraud, through online gaming on social networking profiles.

When it comes to healthcare field internet related things are increase like heart monitoring implants, infusion pumps, pacemakers, insulin pumps, and cochlear implants. Remote patient monitoring (RPM) is as telehealth is a type of healthcare that allows patients to use a mobile device to perform a routine test and then send the data back to their healthcare provider in real-time. ⁸

In today's digital society, concerns about the privacy and security of personal data are constantly increasing, especially in healthcare. Health care staff should be aware of the security measures need to protect their patient data. ⁹

Cyber safety or online safety or internet safety is to give knowledge and information about user's personal safety on internet and self-protection from computer crimes. Achieving the goal of creating a cyber-safe culture requires ongoing initiatives to educate and remind users about online risks.

Title of the study

Effectiveness of online course on knowledge and perception regarding cyber safety among Nursing Students: Mixed method study

Objectives

- To determine the effectiveness of online course regarding cyber safety among Nursing students in terms of change in knowledge.
- To determine the level of perception and factors influencing online course regarding cyber safety as per viewed by Nursing students in experimental group.
- To associate the pretest knowledge regarding cyber safety among Nursing students and with their demographic variables in experimental group.

Hypotheses

- H1: There will be a significant difference between pretest and posttest knowledge regarding cyber safety among Nursing students in experimental group.
- H2: There will be a significant difference between posttest knowledge of experimental and control group regarding cyber safety among Nursing students.
- H3: There will be a significant association between level of knowledge and perception, factor influencing online course regarding cyber safety.
- H4: There will be a significant association between pretest knowledge regarding cyber safety among Nursing students with their demographic variables in experimental.

Materials and Methods

Research approach

Mixed method research approach, Explanatory Sequential mixed method was used in this study. It has taken into account both quantitative and qualitative data.

The research design

Quantitative research: quasi experimental design, non-equivalent control group design.

Qualitative research: focus group interview

Research setting

The study was conducted in selected nursing colleges in Bareilly. The selected colleges are Rohilkhand college of nursing, Keshlata college of nursing, Jyoti College of nursing and vidya college of nursing.

Sample size

Quantitative research: 70 samples for experimental group and 70 samples for control group

Qualitative research: Focus group discussion was conducted until a point of reaching the saturation. Total 16 students.

Sampling technique

Quantitative research: Quota sampling technique was used

Qualitative research: Total of 16 samples were selected purposefully from the group.

Description of research tool

Tool 1: Demographic variable such as age, course, year of studying ,place of residency, number of siblings, mode of social media device, duration of using internet every day, mode of social network services using, type of mobile phone using.

Tool 2: Structured questionnaire contains the knowledge on cyber safety in 10 aspects, they are cyber bullying, cyber grooming, identity theft, online gaming, email fraud and online transaction fraud, cybercrime and health problems, cyber and nursing, cyber laws and cybercrime reporting

Tool 3: Focus group interview was focused on certain aspects of knowledge, perception related to cyber safety and online course factors influencing online course on cyber safety.

Intervention

The timing for administering online course is fixed according to the convenience of college authorities. Online course is administered only to experimental group.it consist of 10 videos related to cyber bullying, cyber grooming, identity theft,

online gaming ,email fraud, online transaction fraud, cyber and nursing ,cybercrime and health problem , cyber laws and reporting of cybercrimes. Each day 2 sessions were administered, total 10 sessions in 5 days. The total duration is 1 hour. Students in the control group given no online course. After the data collection period, they were given online course for 5 days

Result

Table 1
Comparison of mean pre-test and post-test knowledge scores of the experimental group

Test	Range	Mean± SD	Mean Difference	t- value (p value)
Pre-test	27-8= 19	15.93 ± 4.15	9.53	17.15 (0.000)
Post-test	30-15= 15	25.46 ± 3.54		

$t_{(69)} = 1.99$, $p < 0.05$

Table 1 interpreted the mean post-test knowledge score (25.46 ± 3.54) of the experimental group was greater than the mean pre-test knowledge score (15.93 ± 4.15) of the experimental group with the mean difference of 9.53. The calculated t value was (t=17.15) more than the tabled value ($t_{69} = 1.99$). Henceforth the finding denoted there is significance difference in the mean post-test knowledge scores.

Table 2
Comparison of post-test scores of the experimental and control group

Post-test	Range	Mean± SD	Mean Difference	t- value (p value)
Experimental group	30-15= 15	25.46 ± 3.54	10.89	17.20 (0.00001)
Control group	24-0= 24	14.57 ± 3.93		

$t_{(68)} = 1.99$, $p < 0.05$

Table 2 explicated **the** mean post-test knowledge score (25.46 ± 3.54) of the experimental group was higher than the mean post-test knowledge score (14.57 ± 3.93) of the control group with the mean difference of 10.89.

The calculated t value was (t=17.20) greater than the tabled value ($t_{68} = 1.99$). Indicating there is significance difference in the mean post-test knowledge scores. The chi square result revealed that association of socio-demographic characteristics of Experimental group with pre-test knowledge score. Among all demographic variables duration of using internet alone evidenced significant association with pre-test knowledge score at $p = 0.004^*$

Qualitative result

The data collected through interview was analyzed by using qualitative thematic analysis

Table 3
Themes and sub themes formed after data analysis

S.NO.	Theme	Sub-theme
1.	Knowledge related to cyber bullying	
2.	Perception related to cyber safety	
3.	Population characteristics	Previous experience Consciousness related to phishing email
4.	Current Practice of Cyber safety	
5.	Factors influencing online courses related to cyber safety	
6.	Cope up strategies for the victim of cyber crime	

Major themes revealed that:

- Most of the participants were have good knowledge regarding the cyber bullying and its safety.
- The most commonly participants were aware regarding the cyber grooming and its prevention strategy.
- The majority of the participants reported regarding the phishing emails and most are aware to manage this type of event.
- Most of the participants know about the legal process how they can complain these types of events occur in their day to day life.
- Majority of the participants expressed that the online courses regarding cyber safety will beneficial for their future in order to prevent from the cybercrime.
- Most of the participants felt that in the situation of cybercrime with their friends, it is necessary to use the appropriate cope up strategies. It can be taken as an important role to cover up from the painful events.

Discussion

Findings of the present study in similar with study conducted Tsimtsiou, Z., Drosos, E.et al. ¹⁰ conducted study to explore the impact of a health professional-led, school-based intervention in raising awareness on cyber-safety in adolescents. The findings of the study showed that response rate was 90.7%. Younger students scored significantly higher in all six parameters used in the evaluation of this intervention compared with all the older participants, they had kept the presented information on Safer internet websites and the results are compared with the older participants according to parameter wise they are about helpline Ypostirizo 70.2% vs. 33.7%, $p < 0.001$. They had already used it (32.5% vs. 12.3%, $p < 0.001$). They had learned new information on cyber safety (66.4% vs. 34%, $p < 0.001$). They rated the intervention as more interesting (median 8 vs. 7, $p < 0.05$), They had reconsidered the way they use Internet (median 7 vs. 6, $p < 0.05$) and they had changed their cyber behavior (median 7 vs. 5, $p < 0.05$).The researcher concludes that as per the effect of the intervention on the students

awareness on cyber-safety should be given in the earlier period itself and support services to be formulated for the implementation.

To add further to the present study findings, Minal S. Chaudhari et al¹¹ gained more insight from their study the result shows that nursing students have significant score (15.68) of cybercrime and having poor knowledge on cyber safety. There was a significance association found between cybercrime and cyber safety with their selected socio-demographic characteristics like age, gender, father occupation, mother occupation, monthly family income, Time spends on Internet.

Conclusion

The comparison of pre & post test scores on knowledge, in experimental and control group showed that, in the experimental group the post test scores were increased and its was supported by qualitative analysis also students were had good knowledge and perception regarding cyber safety. It proved that the online course on cyber safety was effective. It was also seen that there was statistically significant association between selected socio demographic variable duration of using internet in experimental group and type of mobile phone using in control group. It could be concluded that online was effective in increasing the knowledge and perception regarding cyber safety.

Conflict of interest – No

Source of funding – self

Ethical clearance – obtained from university ethical committee

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