

Research Article

Effectiveness of structured teaching programme on knowledge regarding management of extravasation of chemotherapeutic drugs

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Keywords: Chemotherapeutic drugs; Chemotherapy; Effectiveness; Extravasation; Knowledge; Structured teaching programme



Abstract

Background: More than 1 million intravenous chemotherapy infusions are given worldwide each day which leads to extravasation. Health professionals must know the drugs that cause tissue injury and take the necessary measures to prevent extravasation.

Objectives: The study aimed to assess the knowledge regarding the management of extravasation of chemotherapeutic drugs before and after the implementation of a structured teaching program among staff nurses.

Method: The pre-experimental group pre-test and post-test designs were adopted for the study. The convenience sampling technique was used to obtain 30 staff nurses of Ramaiah Medical College Hospital, India. Both Pre-test and Post-test were performed using the same structured knowledge questionnaire followed by 45 minutes of the structured teaching program. Data were processed through Statistical Package for Social Sciences version 20 and analyzed using descriptive and inferential statistics.

Results: More than half of the subjects were female (66.7%) and 36.7% of the subject had more than 10 years of professional experience. Most of the subjects (70%) had inadequate knowledge during the pretest. The mean knowledge score was 15.33 ± 4.003 and 24.67 ± 5.384 in pre-test and post-test respectively. There was a significant difference in pre-test and post-test knowledge scores regarding the management of extravasation of chemotherapeutic drugs.

Conclusion: The Study concluded that the structured teaching program was significantly effective in improving the knowledge regarding the management of extravasation of chemotherapeutic drugs among nurses.

Introduction

The human body is made up of multiple cells, any events associated with exposure of such DNA to harmful molecules originating from within or outside the body can lead to sudden alteration of the structure of cells and later can develop into cancer. World Health Organization reported cancer is the

second leading cause of death globally which was responsible for 8.8 million deaths in 2015 [1]. Indian Council of Medical Research (ICMR) 2016, reported that 6% of total deaths in India were due to cancers [2]. As per grading and staging of cancer available treatment options are chemotherapy, radiation therapy, surgery, immunotherapy and monoclonal antibody therapy [3]. American Cancer Society stated that



chemotherapy is the mainstay of cancer treatment for tumors and hematologic malignancies [4]. Chemotherapy can be administered intravenous, intramuscular, intracavitary (pleural, peritoneal), intrathecal, subcutaneous, topical, and oral, out of which the IV route is most common [3]. The American Cancer Society and the National Cancer Institute state that in 2016 breast cancer was 48%, cancer of the Colon and Rectum was 26%, and classical Hodgkin lymphoma 88% received chemotherapeutic drugs [5]. More than 1 million intravenous (IV) chemotherapy infusions are given worldwide each day and can lead to complications such as extravasation, ecchymosis, hematoma, and phlebitis [6]. As per damage potential Chemotherapeutic drugs, has classified into five categories: Vesicant (doxorubicin, epirubicin, daunorubicin, idarubicin, dactinomycin), Exfoliants (aclerubicin, liposomal doxorubicin, cisplatin), Irritants (mitoxantrone, etoposide), Inflammittants (methotrexate, raltitrexed) and Neutrals (asparaginase, bevacizumab) [7].

Vesicants have caused extravasation in 0.1% to 6% of patients with peripheral IV access and 0.3% to 4.7% of patients with CVADS (central vascular asses devices) [8].

Chemotherapeutic drugs attempt to destroy tumor cells by interfering with cellular functions and multiplication that will damage the intima of the vein causing extravasation, phlebitis, and sclerosis. Among them, extravasation is the most common complication [3]. Extravasation is the leakage of intravenously infused potentially damaging medications into the extravascular tissues around the site of infusion [9]. The exact incidence of chemotherapy extravasation varies greatly due to the general lack of reporting and the absence of a centralized registry of such events. Prevalence of extravasation due to the administration of chemotherapy ranges from 0.1% to 6% through peripheral intravenous access [10] and 0.26% to 4.7% through the central venous access device [11,12]. A Case study conducted to evaluate extravasation injuries in West India reported incidence of extravasation ranges from 10% to 30% [13] and in Chandigarh 29.8%. According to National Extravasation Information Service (2013), in England, the incidence of extravasation is 39% in adults out of which 5% received chemotherapeutic drugs through injections [14]. The escape of a drug into the extravascular space, either by leakage from a vessel or by direct infiltration leads to extravasation. Risk factors for the chemotherapy extravasation include small and/or fragile veins, lymphedema, obesity, impaired level of consciousness, and previous multiple venipunctures and iatrogenic causes include lack of training of nurses, poor cannula size selection, poor location selection, and lack of time [7].

Extravasation manifested as swelling, stinging, burning, pain at injected site, slowing or stopping the flow rate of infusion lack of blood return, and may lead to soft tissue destruction and necrosis [7]. One-third of all vesicant extravasation proceeds to ulcer formation that requires surgical interventions [8]. Extravasation leads to prolongation of hospitalization, unnecessary diagnostic procedures,

unnecessary treatments, stress, and life-threatening to the patient. It is important for health professionals, who are responsible for managing intravenous applications, to know the drugs that cause tissue injury and take the necessary measures to prevent extravasation [6]. The management of extravasation includes non-pharmacological management such as aspiration and removal of the catheter of the affected extremity as well as elevate, application of cold or warm compression, and pharmacological management such as antidots (dexrazoxane hydrochloride for anthracycline, hyaluronidase, dimethyl sulfoxide), local anti-inflammatory drugs in inflammation and pain management [7].

Several previous studies have demonstrated that nurses' education is essential to prevent, recognize, manage and document chemotherapy extravasation. As per Federal Nursing Council, Nurses are responsible for the planning, organization, execution, and assessment of all nursing actions in clients undergoing antineoplastic chemotherapeutic treatment. Nurses should update their clinical and theoretical knowledge for the management of extravasation through training, in-service education, and teaching programs [15]. Hence the study intended to assess the effectiveness of a structured teaching program on knowledge regarding the management of extravasation of chemotherapeutic drugs among staff nurses.

Methods and materials

The study employed with quantitative approach, and the study design selected was Pre experimental group pre-test and post-test design. The study was conducted among 30 staff nurses who were directly involved in the administration of chemotherapeutic drugs in different areas of Ramaiah Medical College Hospital, Bangalore, India, from November 2016 to June 2018. A nonprobability convenience sampling technique was used to select the sample. Sample size estimation was determined by a similar study conducted in Rajasthan, India, in 2016, using the formula $n = (\alpha_1 + \alpha_2)^2 (Z_{\alpha/2} + Z_{\beta})^2 / (m_1 - m_2)$. Where the n is the sample size, α_1 is Standard deviation of the pre-test (5.425), α_2 is the Standard deviation of the post-test (10.50), $Z_{\alpha/2}$ is the Z value at 95% Confidence intervals (1.96), Z_{β} is Power (1.28), m_1 is Mean of pre-test (12.45) and m_2 is Mean of the post-test (22.05). The estimated sample size was 32. Ten percent (10%) of attrition rate was expected so additional 3 samples were selected, so a total of 35 samples were selected for the study. On the pre-test 35 subjects were selected, whereas 5 subjects were lost due to attrition, so only 30 samples were included for analysis of the data. The inclusion criteria of the study were staff nurses who were directly involved in the administration of chemotherapeutic drugs, and present at the time of data collection. Staff nurses without chemotherapy administration experience were excluded from the study.

A structured lesson plan on the management of



Extravasation and a structured knowledge questionnaire was prepared in the English Language. It contains 35 items with various areas of extravasation, risk factors, signs and symptoms, preventive measures, and management of extravasation of chemotherapeutic drugs. A 'One' mark was awarded for the correct answer and a 'zero' mark for the wrong answer. The maximum score was 35 for the knowledge assessment. The tool and structured teaching program was sent to 9 experts for validation. The reliability of the self-structured knowledge questionnaire was obtained by using the internal consistency method with the Kuder-Richardson-20 formula. The reliability coefficient of the tool was 0.95 which indicated the tool was reliable. A pilot study was done to find out the reliability of the tool, practicability, and feasibility of the study.

Ethical clearance was obtained from Ramaiah Medical College Ethics Committee (MEUNC/EC/02/2018) on 20/02/2018. Written formal permission was obtained from the Administration of Ramaiah Medical College Hospital, Bangalore. The objectives of the study were clearly expressed to the participants as well verbal informal consent of participants was taken before data collection. On the 1st day (26/03/2018), a pre-test was conducted to assess the knowledge on the management of extravasation of chemotherapeutic drugs using a self-structured questionnaire for a duration of 35 - 45 minutes. On the same day, a structured teaching program was conducted through lecture cum discussion and demonstration method using power point presentation and pamphlets and Real Model for a duration of 45 minutes. On the 8th day(02/04/2018) following the pre-test, a post-test was conducted among the subjects using the same tool. Frequency and percentage distribution are used to describe the socio-demographic variables. Mean and standard deviation was used to describe the knowledge among staff nurses. Paired 't' test was used to evaluate the effectiveness of a structured teaching program and the Chi-square test was used to find the association between the level of knowledge and selected socio-demographic variables of staff nurses.

Results

Demographic characteristics

A total of 30 subjects, half of them 50% belong to the age group of 31 - 40 years of age whereas 13.3% belong to the age group of 41 - 50 years. With regard to gender, more than half of the subjects 66.7% were females and 33.3% were males. More than half of the subject 66.7% had completed General Nursing and Midwifery (G.N.M.) course, whereas 10% had done Post Basic Science of Nursing (P.B.Sc.N) and 23.3% Bachelor of Science in Nursing (B.Sc.N.). With regard to the total years of professional experience of the subjects 36.7% had more than 10 years, 26.6% had 6 - 10 years, 30% had 1 - 5 years and 6.7% had less than 1 year of professional experience. Of the majority of subjects, 70% were having less than 1 year, 6.7% of subjects had 1 - 3 years, 13.3% had 4 - 6 years and 10% had

more than 6 years of experience in chemotherapeutic drug administration. With regards to the Area of work majority of subjects 53.3% were working in the ICU, 30% were working in the Oncology ward and 16.7% were working in the General ward. None of the subjects had attended the Continue Nursing Education (CNE) program regarding the management of extravasation of chemotherapeutic drugs (Table 1).

Knowledge regarding the management of extravasation of chemotherapeutic drugs

The pretest result of the study stated that the majority of the subject had a clear idea about chemotherapy, whereas only a few subjects (8%) stated that extravasation is a complication of chemotherapy. Less than half of the subjects that is 40% knew the risk factor of extravasation. About 80% of subjects knew early signs of extravasation as warm skin, erythema, and edema at the injected site but only 40% knew the correct answer for late signs of extravasation. Only 23% of subjects had knowledge about the grading of extravasation. Though the most of subjects gave correct responses on preventive measures of extravasation only 16.1% knew that Vesicant drugs should be administered before antineoplastic drugs (Table 1). More than half of the subjects (63.3%) answered that the infusion or injection must be stopped in case of suspecting extravasation, whereas only 16.7% stated applying pressure over the site is strictly prohibited. Most

Table 1: Socio-demographic Characteristics of Respondents $n = 30$.

Characteristics	Frequency (n = 120)	Percentage%
Age		
21-30	11	36.70
31-40	15	50.00
41-50	4	13.30
Mean±SD	32.03±6.16	
Gender		
Male	10	33.30
Female	20	66.70
Professional Qualification		
GNM	20	66.70
P B Sc N	3	10.00
B Sc N	7	23.30
Professional Experience		
< 1 year	2	6.70
1 - 5 years	9	30.00
6 - 10 Years	8	26.60
> 10 Years	11	36.70
Area of work		
Oncology Ward	9	30.00
General Ward	5	16.70
ICU	16	53.30
Years of experience in chemotherapeutic drug administration		
< 1 year	21	70
1-3 years	2	6.7
4-6 years	4	13.3
> 6 years	3	10
Attended any CNE program regarding the management of extravasation of chemotherapeutic drugs		
Yes	0	0
No	30	100



of the subjects gave the wrong answer on the management of extravasation. The aggregate response was summarized in Table 2.1 and Table 2.2. During the pre-test majority of subjects, 70% had inadequate knowledge and 30% had moderate knowledge, whereas in the post-test majority of subjects 50% had adequate knowledge, 43.3% had moderate knowledge and 6.7% had inadequate knowledge (Table 3).

Effectiveness of STP on knowledge regarding management of extravasation of chemotherapeutic drugs

Paired *t* - test was used for analyzing the effectiveness of a structured teaching program on knowledge regarding the management of extravasation of chemotherapeutic drugs. The

paired *t* - test value was 7.747 and was tested at a $p < 0.05$ level of significance. The mean pre-test level of knowledge increased from 15.33 to 24.67 in the post-test. There was a significant difference in pretest and post-test knowledge scores regarding the management of extravasation of chemotherapeutic drugs before and after implementation of a structured teaching program with a 5% of error percentage (Table 4).

Association between the pre-test level of knowledge and socio-demographic variable

A Chi-square test was used to assess the association between pretest knowledge and socio-demographic variable

Table 2.1: Knowledge Questionnaire on meaning, risk factors, and preventive measures of Extravasation of chemotherapeutic drugs.

S.N.	Description	Correct Response (n = 30)	
		Pretest f(%)	Post-test f(%)
1.	Chemotherapy is a chemical substance used to treat cancerous cell	29(96.7)	27(90)
2	Sclerosis, phlebitis, and extravasation are the complications of Chemotherapeutic drugs	8(26.7)	7(23.3)
3	Extravasation is the accidental infiltration of chemotherapeutic drugs into the subcutaneous tissue	10(33.3)	28(93.3)
4	Vesicants, Irritants, and exfoliants are the classification as chemotherapeutic drugs as per their potential for tissue damage	16(53.3)	28(93.3)
5	Accidental leakage of the vesicant solution has a high potential to cause tissue necrosis	10(33.3)	19(63.3)
6	Aclarubicin, Cisplatin, and Doxorubicin are exfoliants	14(46.7)	22(73.3)
7	Small, fragile veins with peripheral vascular disease are risk factors for extravasation	12(40)	20(66.7)
8	High concentration, Low P ^H value, and high osmolality are the properties of medicine that have a high risk to develop extravasation	12(40)	15(50)
9	Warm, erythema, and edema at the injected site are early signs of extravasation	26(86.7)	24(80)
10	Late signs of extravasation occur after 2 days to 3 weeks	12(40)	21(70)
11	Blisters, necrosis, and ulcers are late signs and symptoms of extravasation	8(26.7)	25(83.3)
12	Ulceration and blanched skin refers to grade III extravasation	7(23.3)	15(80)
13	The occurrence of extravasation is confirmed by Visual assessment	24(80)	26(83.9)
14	Preventive measures of extravasation include the usage of large, soft, resilient veins in the forearm for cannulation	21(70)	27(90)
15	The cephalic vein is a preferred vein for peripheral IV Cannulation	14(46.7)	23(76.7)
16	18 Gauge IV catheter size is required for IV chemotherapeutic drug administration	23(76.7)	28(93.3)
17	The venous line should be flushed with 0.9% sodium chloride or 5% glucose	27(90)	22(73.3)
18	Selection of appropriate site, size of catheter, use of appropriate fluids, stabilization of catheter, and proper administration techniques can prevent extravasation	12(40)	22(73>3)
19	Vesicant drugs must be administered through the cannula, which is inserted within 24 hours	26(86.7)	28(93.3)
20	Vesicant drugs should be administered before antineoplastic drugs	5(16.1)	17(56.7)
21	Vesicant drugs need to infuse more than 12-24 hours through the central venous catheter	4(13.3)	4(13.3)

f: frequency; %: percentage

Table 2.2: Knowledge Questionnaire on Management of Extravasation of chemotherapeutic drugs.

S.N.	Description	Correct Response (n = 30)	
		Pretest f(%)	Post-test f(%)
1	Nurses' first action in case of suspecting extravasation is to stop injection/infusion	19(63.3)	83.3)
2	Never apply direct manual pressure to the site of extravasation	5(16.7)	13(43.3)
3	Stop infusion - classify drug - aspirate - apply cold/warm pack- mark area - elevate limb - inform doctor - documentation. Are the sequence of extravasation management	13(43.3)	24(80)
4	Cold pack is not useful in Vesicant non-DNA binding drugs	7(22.6)	21(70)
5	Hot pack is used in Vesicant non -DNA binding drug	5(16.7)	15(30)
6	Extravasation kit contains a Cold/warm pack, syringes, permanent marker, antidotes, management algorithm, documentation form	19(63.3)	27(90)
7	Antidote for Vincristine drug is hyaluronidase	10(33.3)	19(63.3)
8	The ideal time for administration of hyaluronidase in case of extravasation is 1 hour	8(26.7)	12(40)
9	A common route for injection hyaluronidase is subcutaneous	1(3.3)	23(76.7)
10	The antidote for anthracycline is dexrazoxane	5(16.7)	19(63.3)
11	Antidote DMSO (dimethyl sulfoxide) is used in the case of Vesicant DNA- binding drugs	3(10)	20(66.7)
12	The first immediate action taken by a nurse in case of extravasation caused by a vesicant-DNA-binding drug is the application of topical DMSO	1(3.3)	17(56.7)
13	Apply topical hydrocortisone cream 1% and warm pack to the extravasated area with exfoliants	3(10)	19(63.30)
14	The nurse is primary responsible person for the prevention and management of extravasation	25(83.3)	29(96.7)

f: frequency, %: Percentage

Table 3: Pre-test and post-test level of knowledge regarding management of extravasation of chemotherapeutic drugs.

S.N.	Level of knowledge	Pre-test (n = 30)		Post-test (n = 30)	
		Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
1	Inadequate knowledge (<50%)	21	70	2	6.70
2	Moderate knowledge (50-75%)	9	30	13	43.30
3	Adequate knowledge (>75%)	0	0	15	50
	Total	30	100	30	100

Table 4: Knowledge regarding management of extravasation of chemotherapeutic drugs before and after Structured Teaching Programme among staff nurses n = 30.

	Mean	SD	"t" test	p - value
Pre-test	15.33	4.003	7.747 df(29) S*	<0.001
Post-test	24.67	5.384		

S* = significant

Table 5: Association between pre-test score of knowledge with socio-demographic variable n = 30.

S.N.	Socio-demographic	Score of knowledge		Chi-square value (χ^2)	p - value
		Below median	Above median		
1.	Age in years			2.058 (df 1) NS	0.151
	<35	10	12		
	≥ 35	6	2		
2.	Gender			0.067 (df 1) NS	0.796
	Male	5	5		
	Female	11	9		
3.	Professional Qualification			0.067 (df 1) NS	0.796
	Diploma	11	9		
	Bachelor	5	5		
4.	Professional Experience			0.433 (df 1) NS	0.510
	1-5 years	5	6		
	6-10 years	11	8		
5.	Years of experience in chemotherapeutic drugs administration			0.014 (df 1) NS	0.904
	1-3 years	12	10		
	4-6 years	4	4		
6.	Area of work			0.179 # (df 2) NS	0.915
	Oncology	5	4		
	General ward	3	2		
	ICU	8	8		

NS: Not Significant at $p \leq 0.05$ df: degree of freedom # = 4 cells (66.7%) have expected count less than 5. The minimum expected count is 2.33.

at a 1% percentage error. A significant association between pre-test score of knowledge and socio-demographic variables such as age, gender, professional qualification, professional experience, years of experience in chemotherapeutic drug administration, and area of work was not found Table 5.

Discussion

The study includes 30 nurses out of which 66.7% were female. This predominance of females number in the oncology sector. The result corroborates the predominance of historical characteristics of nursing as a profession that almost all oncological work is performed by a female [16]. The front liner nurses of the oncological ward were of age 30 - 50 years and the maximum participants had their diploma degrees and none of them had attended any CNE program. Thirty percent of nurses had a moderate level of knowledge and 70% had an inadequate level of knowledge regarding the management of extravasation of chemotherapeutic drugs before a structured teaching program, whereas 50% had an adequate level of knowledge, 43.3% had a moderate level of knowledge and 6.7% have an inadequate level of knowledge after structured teaching program. The study finding was supported by a

descriptive study conducted to assess knowledge and practice of prevention and management of extravasation among 60 staff nurses in Uttar Pradesh, India in 2016. The result of the study showed that 23.3% had adequate knowledge, 66.7% had moderate knowledge and 10% had inadequate knowledge with a mean knowledge score of 13.43 ± 2.62 . The majority of the staff nurses have moderate knowledge with good practice [17]. A similar exploratory cross-sectional study was conducted to investigate the work of 21 nurses in the extravasation of antineoplastic chemotherapeutic drugs in Brazil. The result of the study revealed that 38.1% had inadequate knowledge, 33.4% had moderate knowledge and 28.5% had adequate knowledge. The study showed that the mean score of the subject was 2.81 with a standard deviation of 1.8335. Nurses comprise sufficient knowledge regarding the extravasation of chemotherapeutic drugs [18]. The present study showed that the mean knowledge score of subjects was 15.33 with a standard deviation of 4.003 in the pre-test whereas in the post-test mean knowledge score was 24.67 with a standard deviation of 5.384. There was a significant difference in knowledge score regarding the management of extravasation of chemotherapeutic drugs before and after implementation of the structured teaching program at



$p < 0.001$. The study revealed that a structured teaching program is effective in improving the knowledge of staff nurses. In the literature has been reported that a similar study program was effective in improving the knowledge of nurses. The finding of the study was supported by a single group pretest post-test intervention study conducted in Rawalpindi, Pakistan in 2012 among 35 oncology nurses to assess the effectiveness of educational sessions on knowledge, skill, and attitude regarding chemotherapy administration. The results showed that the mean knowledge score of subjects was 21.27 with a standard deviation of 8.934 in the pre-test whereas in the post-test mean knowledge score was 28.55 with a standard deviation of 7.005. Cochran's Q test showed that knowledge scores of pre-test had significantly increased at post-test with "educational training" at p - value < 0.001 [15]. A similar quasi-experimental study supports the present study that conducted to determine the effectiveness of planned teaching program on knowledge regarding prevention and management of thrombophlebitis/extravasation in cancer patients receiving chemotherapy among 40 staff nurses, in Rajasthan, India. The result of the study showed that the mean pre-test score of knowledge is 12.45 with a standard deviation of 5.925 whereas the post-test mean score of knowledge is 22.05. The paired t - test value is 14.14 at a $p < 0.05$ level of significance, which stated that there was a significant difference in pretest and post-test knowledge scores [19].

There was no association between the pre-test knowledge scores and socio-demographic variables of staff nurses directly involved in the administration of chemotherapeutic drugs in different areas at $p < 0.05$. The finding of the study is supported by an exploratory cross-sectional study conducted in Brazil. The result of the study revealed that there was no statistically significant association between knowledge about prevention and intervention on extravasation of antineoplastic drugs and selected socio-demographic variables such as specialization in oncology, length of time working with chemotherapeutic drugs, and a number of weekly working hours as the calculated p - value was more at 0.05 level of significance. Whereas there was a statistically significant association between knowledge about prevention and intervention on extravasation of antineoplastic drugs and sociodemographic variables such as work sector and type of institution where undergraduate courses by nurses were taken as the calculated p - value is less at 0.05 level of significance [18].

The finding of the study was contradicted by another postal survey study conducted to explore the nurses' experiences, attitudes, and educational preparation for the chemotherapy administration process among 507 nurses in London, UK. There was a significant association between time qualified, time working in oncology, and the number of years administering chemotherapy [20]. The present study was the first kind of study in India in which the effectiveness of a structured teaching program was assessed regarding the management of extravasation of chemotherapeutic drugs.

The structured teaching program was found to be effective in improving the knowledge of nurses. This study would be a contribution to evidence-based literature in the Indian context. Despite the narrow scope of the study and the various limitations, the results of the current study may be assumed to be an important addition to the existing body of knowledge, especially in the Indian context as no previous research within the oncology nursing population, has been conducted in this field. The potential limitation of the study includes its small sample size which might not be enough to represent the total population of our country.

Conclusion

The study concluded that among staff nurses directly involved in the administration of chemotherapeutic drugs, none of the subjects had adequate knowledge in the pre-test whereas in the post-test 50% had adequate knowledge. The pre-test knowledge score of subjects was 15.33 + 4.003, whereas in post-test mean knowledge score was 24.67 + 5.384. It showed that there was an overall increase in knowledge scores regarding the management of extravasation of chemotherapeutic drugs. With regard to the association between level of knowledge and socio-demographic variables, no association was found between pre-test level of knowledge and the socio-demographic variables at $p \leq 0.05$. Thus on the basis of the findings, the researcher concluded that a structured teaching program was effective in improving the knowledge of staff nurses regarding the management of extravasation of chemotherapeutic drugs.

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Corresponding author's affirmation

None of the material in the manuscript is included in another manuscript, has been published previously, or is currently under consideration for publication elsewhere. Ethical guidelines were followed by the investigator in performing the study. Each author has participated sufficiently and equally in the work to take public responsibility for the content of the paper and for the final version of the manuscript. If needed, the data will be provided and will cooperate fully to provide the data on which the manuscript is based for examination by the editors or their assignees.

Authors' contribution

Pooja Prakash, Santosh Kumar Das, Malathi Kotha, and Ayush Chandra contributed to the conceptualization and drafted the article. Avinash Chandra, Gyaljin Sherpa, and Barsha Prakash critically revised the article. Pooja Prakash and Malathi Kotha contributed to the statistical analysis, and study design. Sudikshya Acharya has contributed to data collection, questionnaire design, and revision of the manuscript.



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