RESEARCH ARTICLE

NURSE' KNOWLEDGE REGARDING INTRAVENOUS THERAPY IN A TERTIARY CARE HOSPITAL: A CROSS-SECTIONAL STUDY

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Manuscript Info	*Abstract*
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Context: In hospital settings, most of the time intravenous fluids and drugs administered to patients and nurses are responsible for administration and care of intravenous therapy. However, patients may develop complications related to intravenous therapy due to inadequate competency and knowledge of nurses regarding intravenous therapy.
Aims: The present study was conducted to ascertain the knowledge regarding administration and care of intravenous therapy among the staff nurses working at tertiary care hospitals.
Methods: A Cross-Sectional research design was adopted to ascertain the nurses' knowledge of intravenous therapy. A total of 400 nurses were selected through simple random sampling technique from a tertiary care hospital. A self-structured questionnaire was used to assess the nurses' knowledge of IV therapy. The data were analyzed using descriptive and inferential statistic.
Result: The finding of the study indicated that the overall mean knowledge score of nurses was 15.71±4.18. The demographic variables which influenced the level of nurses' knowledge significantly were their professional education (p=0.003) and attended refresher courses on IV therapy (p=0.000).
Conclusion: Nurses had an inadequate level of knowledge on administration and care of IV therapy. The administration of IV therapy could be improved by the provision of the in-service education programme.

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Introduction:-
Intravenous therapy and care of vascular devices play a central role in the delivery of modern health care treatment. Intravenous (IV) therapy has become a major component of patient care in hospital and nursing homes. It is prescribed for almost every individual who is admitted to the hospital and is used to support patient with acute and chronic problems.[1] As nurses play a pivotal role in rendering quality care, they must be knowledgeable of modified and advanced technique, to meet the specific need of each patient. [2]

Intravenous therapy is the administration of medicine, fluids, nutrition, blood and blood products through parenteral route for a patient. Administration of fluids and other product through a vascular access device is considered IV therapy.[3] One of the most common complications related to IV therapy is thrombophlebitis which is due to infection and a probable reason for increased complications. Complications associated with IV therapy are preventable by healthcare professionals especially nurse. To prevent IV therapy related complications, the nurses require enhancing their knowledge. [4-5]

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Knowledge and practice of nurses regarding IV therapy is an essential component to render quality care to the patient with IV therapy. [6] Nurses are continuously being asked to extend and expand their traditional roles for professional development. Furthermore, it was also suggested that nurses need to have the competency to provide patient care. [7] Very few studies were conducted on this topic in the healthcare setting previously.[8-9] Thus, the investigators felt the need to find out knowledge of nurses regarding care and administration of IV therapy.

Subjects and Methods:-
Study Design and Duration:
This cross-sectional study was carried out at a tertiary care teaching hospital in northern India to ascertain the nurses' knowledge regarding the administration of intravenous therapy. The study was performed from 11th March 2018 to 10th April 2018.

Ethical Consideration:
Ethical approval was obtained from the institutional ethics committee vide letter no. PMCH/IEC/20/244 dated 09.02.2018. The purpose of the study was well informed to all the participants and all of them were anonymized by name and institute. An informed written consent was taken from each participant.

Study Participants:
Nurses from selected tertiary care hospital were included as the study population. We enrolled only those nurses, who were willing to participate. A total of 400 participants were enrolled using simple random sampling technique while participants who have not been met inclusion criteria were excluded.

Sample Size Estimation:
Sample size was estimated by using formula $(Z1 - a/2)^2$ (p) (q)/d2 [10] with 5% margin of error, 95% confidence interval and prevalence were taken from the previous study [9] which was 50.9%. The minimum estimated sample size was 384 participants and after consideration of 5% no dropout rate, total 400 sample size was taken for this study.

Study Instrument and Questionnaire Design:
The study was conducted using a structured questionnaire. The questionnaire consisted two sections; Section I: 6 items related to demographic variables of participants (age, gender, professional qualification, total years of experience, area of working, and attended refresher course on IV therapy); Section II: 30 items related to care and administration of IV therapy; to assess nurses' knowledge. There were only multiple choice type questions in section II and to carry out quantitative analysis, it was required to score the responses, i.e. 'right answer' scores '1' while 'wrong answer' score '0'. The total maximum and minimum score were 30 and 0 respectively. The questionnaire was validated by a panel of experts including three physicians, three nurses and one native English speaker. To ascertain the reliability of the questionnaire, Cronbach's alpha was calculated and it was 0.87 which indicated the good internal consistency of all items in the tool. Further, this questionnaire was piloted on 30 nurses and found feasible.

Data Analysis:
The collected data was organized and transferred to excel sheets. Statistical analysis was performed by using the statistical computer package, IBM Statistical Package for the Social Sciences (SPSS 23.0). Data were analyzed through descriptive and inferential statistics. Participants' demographic variables were analyzed and presented in frequency and percentage while participants' level of knowledge was assessed and presented in mean, standard deviation and median. Student't' test and one-way ANOVA was used to find out the association of average knowledge regarding IV therapy with selected demographic variables of participants at 0.05 level of significance.

Results:-
As depicted in **Table 1**, most of the participants were male (61%), aged between 26 and 30 years (53.25%) and had a diploma in nursing (63.25%). Only 5.75% of participants had less than 1 year of working experience in hospitals and more than one-fourth (27.5%) of participants were working in medicine department. Majority of participants (86.25%) had not attended any workshop/seminar/conference on IV therapy.

Table 1:- The participants' demographical variables.

Demographic Variables	Respondents (N=400)

	Frequency (%)
Age(in years)	
21-25	81 (20.25)
26-30	213 (53.25)
>30	106 (26.5)
Gender	
Male	244 (61)
Female	156 (39)
Professional Education	
Diploma in nursing	253 (63.25)
Graduation in nursing	118 (29.5)
Post-graduation in nursing	29 (7.25)
Total experiences (in years)	
≤1year	23 (5.75)
1-3	107 (26.75)
3-5	169 (42.25)
>5	101 (25.25)
Area of working	
Medicine department	110 (27.5)
Surgery department	97 (24.25)
Orthopedics department	78 (19.5)
Gynaecological and obstetric department	68 (17)
Paediatric department	47 (11.75)
Attended seminar/workshop/conference on IV therapy	
Yes	55 (13.75)
No	345 (86.25)

As demonstrate in **Table 2,** the nurses' mean knowledge scores regarding IV therapy ranged between 14.2 and 16.8 with a total mean score of 15.71±4.18 on 30 items questionnaire. Nurses who were holding higher degree had better mean knowledge scores which was statistically significant (nurses holding diploma {14.3±4.13}, degree {15.6±4.2} and post-graduation in nursing {16.7±4.28}; p =0.003). Nurses who attended refresher courses such as seminars/workshops/conferences on IV therapy had a significantly better mean score than who did not attend the refresher courses (16.8±4.3 and 14.2±4.06; p=0.000). No other nurses' demographics variable is significantly affected the knowledge score of nurses regarding IV therapy.

Table-2:- Scores of participants on 30 items questionnaire according to their demographic variables.

Demographic Variables	Knowledge Scores		Test
	Mean±Sd	Median (IQR)	p-value
Age(in years)			
21-25	15.7±3.9	15 (11-19)	f=0.789
26-30	15.8±4.3	16 (11-20)	p =0.357
>30	16.1±4.3	16 (12-20)	
Gender			
Male	15.9±4.16	16 (11-19)	t =0.702
Female	16.1±4.23	16 (12-20)	p=0.483
Professional Education			
Diploma in nursing	14.3±4.13	14 (9-18)	f =9.013
Graduation in nursing	15.6±4.2	15 (11-19)	p =0.003*
Post-graduation in nursing	16.7±4.28	16 (11-20)	
Total experiences (in years)			
≤1year	15.7±4.1	15 (11-20)	f =0.837
1-3	15.5±4.13	15 (11-19)	p=0.568
3-5	15.17±4.1	15 (11-19)	
>5	15.28±4.21	15 (11-19)	
Area of working			
Medicine department	15.7±4.17	16 (11-21)	

Surgery department	15.9±4.32	16 (11-20)	f =2.428
Orthopedics department	16.1±4.31	16 (10-19)	t =0.287
Gynaecological and obstetric department	15.9±4.24	16 (11-20)	
Paediatric department	16.2±4.31	16 (11-21)	
Attended refresher courses such as seminar/workshop/conference on IV therapy			
Yes	16.8±4.3	17 (13-23)	t=4.324
No	14.2±4.06	14 (9-19)	p=0.000*

p-value* (<0.05) indicates significant difference between the groups.
IQR – interquartile range

Discussion:-
The findings of the present study highlight that nurses had a low knowledge score regarding administration and care of IV therapy. The total mean knowledge score of nurses in this study was 52.36% which was relatively low with other studies [8-9] as they reported nurses' knowledge on IV therapy were 68.75% and 66.7% respectively.

Findings of this study about influencing factors on nurses' knowledge were in the loop with another study [8] which reported that professional qualification and in-service education were associated with knowledge but the association of age and professional experiences with knowledge had contradiction with our study's findings. The inadequate knowledge of nurses reflects the probable reason that a majority of participants (>63%) were only diploma holders. As suggested in a study [11] diploma holder nurses are not prepared or have enough knowledge to render evidence-based care. Moreover, this study found that the level of nurses' knowledge was directly associated with the participants' level of education. On the basis of our study findings, we suggested that nurses should be encouraged to get higher education so that they may enhance their knowledge and ability to provide evidence-based care to their clients.

Other associated factor in our study was to attend refresher courses such as seminars/workshops/conferences on IV therapy which was consistent with other studies [8-9] which reported that participants who attended 46.8% and 88.8% respectively had significantly higher knowledge scores than those who did not attend in-service education. In view of the rapidly and continuously changing information and technology in the medical field, it is crucial that nurses must undergo regular training and continuing education programs for updating their knowledge and skills. As it was reported that interventional package was found to be an effective strategy to enhance the knowledge of nurses regarding patient care. [12] Therefore, it is necessary for health care institutes to arrange and ensure regular training and continuing education programs for nurses.

This was a single centric study. In addition, all information was self-reported, and no cross-validation of these data was made. Therefore the findings of our study should be generalized cautiously.

Conclusion:-
The present study concluded that nurses' working in a tertiary care hospital had inadequate knowledge of IV therapy. The factors which were influencing the level of knowledge are professional qualification and attended refresher courses. Hence, it is suggested to increase the participation of nurses in workshops/seminars/conferences regarding IV therapy. In addition, it is also recommended for reinforcement of IV therapy protocol and effective supervision for enhancing nurses' knowledge.

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