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RESEARCH ARTICLE
НАУЧНАЯ СТАТЬЯ

Nursing awareness of oxygen therapy among nurses at selected district hospital in Nepal

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Abstract. Relevance. Oxygen therapy is commonly used in the emergency and critical cases which is the first line treatment in many critical conditions. Oxygen therapy is a medical treatment prescribed mainly for hypoxic patients, which provides oxygen at higher concentrations than that found in atmosphere (>21%). Oxygen administering depends on the needs of the patients' conditions and in some cases medical treatment. The present study aims to assess the level of awareness on oxygen therapy among nurses and examine the association between level of knowledge, attitude and selected socio-demographic variables. *Materials and Methods.* A quantitative descriptive cross-sectional study design was used. A non-probability purposive sampling technique was used to select 125 samples. The data were collected for 6 weeks using a semi-structured self-administered questionnaire. Descriptive statistics (frequency, percentage, mean, standard deviation) was used for quantitative data analysis and inferential statistics (chi-square) were used to find out the association between level of knowledge, attitude and selected socio-demographic characteristics of the respondents. *Results and Discussion.* The study revealed that 74.4% of the nurses had unsatisfactory level of knowledge, 20% had average knowledge and 5.6% had satisfactory level of knowledge regarding oxygen therapy. A significant association was found between the knowledge level and age, educational status and experience of the respondents ($p=0.001, 0.000, 0.016$). *Conclusion.* The study concluded that the level of knowledge among nurses regarding oxygen therapy has lower than expected and is unsatisfactory. The results of the study can provide a framework for the healthcare policymakers to develop and implement educational programs on oxygen therapy for nurses in hospital setting.

Keywords: oxygen therapy, hypoxia, nurses, knowledge

Author contributions. The authors declare an equal contribution to the participations of the article.

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Oxygen therapy (OT) is a medical treatment prescribed mainly for hypoxic patients, which provides oxygen at higher concentrations than found in atmosphere (>21 %) [1]. It is listed as a core item on the World Health Organization's (WHO) model of essential medicines, which is a list of the most effective and safe [2]. OT is vital to sustain human life; it is one of the most widely prescribed for patients with different health conditions. Oxygen therapy is commonly used in the emergency and critical cases which is the first line treatment in many critical conditions. Oxygen administration depends on the needs of the patients' conditions and in some cases the medical team also advises. If oxygen therapy is given inappropriately, it could be fatal. Hence, patients must receive OT in an appropriate, safe, and comfortable way [3]. Although oxygen therapy is lifesaving, it may be associated with deleterious effects when administered for prolonged periods at high concentrations. In the human body, oxygen makes up 65 % of body mass. Oxygen plays a very essential role in the body; as it allows humans to burn food, releasing energy. Every cell in the human body needs oxygen to survive [4]. Individuals' health status, activity level, and hydration are factors affected by how much human beings need for oxygen. Without adequate oxygen, health problems are definitely occurring. Oxygen deprivation in the human body doesn't occur suddenly; it could take long time to occur, occurring over months or years. The reasons for oxygen deprivation are varied, that might result from individual's health factors or environmental factors. The health effects of oxygen deprivation can be severe; it's even linked to tumor growth [5].

Oxygen therapy, when performed with appropriate dosage, is useful; however, it has significant adverse effects in addition to its therapeutic characteristics when performed inappropriately. Among these adverse effects are hypoventilation, atelectasis, pulmonary oxygen toxicity, retrolental fibroplasia, irritation, pain and infection [6—7].

Nurses are the medical team who are directly dealing with patients' lives for 24 hours; OT is commonly used in the hospital so the knowledge on OT is essential for the nurses.

Oxygen supplementation is a lifesaving treatment in emergency conditions and is commonly used as a therapeutic agent in emergency and ICU departments. Many patients cannot survive without additional oxygen treatment [8]. Oxygen therapy is prescribed in patients to reduce the respiratory work [9]. Even if oxygen therapy is a lifesaving agent, it can also cause adverse effects when given for long periods at high concentration. According to Browne & Crocker; Oxygen should be administered to achieve a target saturation of 94—98 % for most critically ill patients or 88—92 % for those at risk of respiratory insufficiency or hypercapnia [10].

Decisions of nurses in oxygen therapy are very important and may impact patient outcomes. Critical care nurses must be equipped with knowledge, good attitude in the oxygen administration practices of critical ill patients [11]. In developing countries, the staff is not well trained in caring for critically ill patients, leading to a lack of knowledge of critical care principles and that cause a barrier to quality care [12].

A study among nurses' knowledge, attitude and practice about oxygen therapy in Orotta national hospital showed that the mean percentage score on knowledge, attitude and practice were 40 %, 60 % and 60 % respectively. Knowledge, attitude and practice on oxygen therapy was good in 43.3 % for knowledge; 63.3 % for attitude; 45 % for practice respectively. It was found out that poor knowledge, attitude and practice on oxygen therapy were attributed due to lack of training, availability of oxygen therapy guidelines, and adequate supply of oxygen and delivery devices. This study showed that there was a gap in knowledge, attitude and practice among the respondents [13].

Based on the evidence from earlier studies, nurses' knowledge and attitude regarding oxygen therapy are shown poor. In the context of developing countries

like Nepal few studies has been conducted till now. Taking into consideration of these issues, this study is aimed to assess knowledge and attitude on oxygen administration among nurses.

Materials and methods

A quantitative descriptive cross-sectional study design was used. A non-probability purposive sampling technique was used to select 125 samples. The data were collected for 6 weeks using a semi-structured self-administered questionnaire. Descriptive statistics (frequency, percentage, mean, standard deviation) was used for quantitative data analysis and inferential statistics (chi-square) were used to find out the association between level of knowledge, attitude and selected socio-demographic characteristics of the respondents.

The study has been approved by Institutional Review Ethical Committee of Gandaki Medical College (GMC—IRC) of Nepal. Written informed consent has also been obtained from the research participants.

Results and its discussion

The response of the study was only 88 % because of unviability of respondent during COVID19. More than half (57.6 %) of the respondents were aged 25 years and above, with a mean age of 26. More than half (56.8 %) of the respondent were PCL nursing. one third (63.2 %) of the respondents had more than 2 years of experience. Half (52.8 %) of respondents works in general wards. Majority (90 %) of the respondent did not get training regarding oxygen therapy.

Level of knowledge regarding oxygen therapy

Regarding the level of knowledge three fourth 74.4 % of the respondents had unsatisfactory level of knowledge on oxygen therapy. About 20 % of respondent had average level of knowledge on oxygen therapy. Only 5.6 % of respondent had satisfactory level of knowledge on oxygen therapy.

Table 1

Socio- demographic Characteristics of the Respondents (N=125)

Variables	Number	Percentage (%)
Age in years		
Less than 25 years	53	42.4
25–40	72	57.6
Median=25, Min=19, Max=39		
Education		
PCL	71	56.8
Bachelor	54	43.2
Experience		
0–2 years	46	36.8
More than 2 years	79	63.2
Working unit		
Critical ward	59	47.2
General ward	66	52.8
Training		
No	120	96.0
Yes	5	4.0

Table 2

Level of knowledge regarding oxygen therapy

Level	Number	Percentage
Unsatisfactory	93	74.4
Less than 60 %		
Average	25	20.0
60–75 %		
Satisfactory	7	5.6
More than 75 %		

Regarding the level of attitude almost all 95.2 % of respondents had positive attitude towards oxygen therapy. Only 4.8 % of respondents had negative attitude towards oxygen therapy.

Table 3

Level of attitude towards oxygen therapy

Level	Number	Percentage
Positive	119	95.2
Negative	6	4.8

Factors affecting the level of knowledge

The factors that may contribute to the knowledge level of respondents were analyzed. Chi-square test revealed a significant association between the level of

knowledge and age ($\chi^2= 9.034, p= 0.011$), Education ($\chi^2= 29.724, p= 0.000$), Experience ($\chi^2= 8.299, p= 0.016$). However working unit and training had no significant association with the level of knowledge of respondents.

Table 4

Association between level of knowledge and sociodemographic characteristics

Characteristics	Knowledge Level			χ^2	p-value
	Unsatisfactory n (%)	Average n (%)	Satisfactory n (%)		
Age in years					
Less than 25 years	39	9	5	9.034	0.011*
25–40	54	15	3		
Education					
PCL	66	4	1	29.724	0.000*
Bachelor	27	21	6		
Experience in years					
0–2 years	41	4	1	8.299	0.016*
More than 2 years	52	21	6		
Working unit					
Critical ward	45	12	2	1.034	0.596
General ward	48	13	5		
Training					
No	89	24	7	0.314	0.855
Yes	4	1	0		

Factors affecting the level of attitude

The factors that may contribute to the attitude level of respondents were also analyzed. Chi-square test revealed no association between the level of attitude with the sociodemographic variables.

The present study shows that majority of the respondents have unsatisfactory level of knowledge on oxygen therapy less than one third have average and only few respondents have satisfactory knowledge, whereas majority of respondents have positive attitude and only few respondents have negative attitude towards oxygen therapy.

The study findings are similar with the study conducted among north east Africa done by Fanuel et al [14] where poor or unsatisfactory knowledge on oxygen therapy. The study findings are also similar with the study done by Addis which revealed that nurses in hospital of Ethiopia do not have sufficient of knowledge about oxygen therapy [15]. The study findings are also in line with another study done in Turkey which

revealed that the majority of respondents in this study have inadequate knowledge on oxygen therapy [16].

The current study shows that age, education and experience have significant association with education status. The study findings which are significant with age is similar with the study conducted by the Demirel H. in Turkey [16]. Education level is significant in our study which is similar to study conducted by V. Uwineza Didi in hospital of Rwanda [17]. Likewise, another significant in our study experience is similar to the study conducted by Demirel H. in hospital of Turkey [16].

The current study shows no association between levels of knowledge with working unit, training. In contrary study conducted by Demirel H. [16] showed there were significant associations between the level of knowledge on oxygen therapy and working unit ($P=0.000$). The similar study done by Ghebremichael F.G. also showed there were no significant association between level of knowledge on oxygen therapy and training ($P=0.157$) [14].

Table 5

Association between level of attitude and socio-demographic characteristics

Characteristics	Attitude Level		χ^2	p-value
	Positive n (%)	Negative n (%)		
Age in years				
Less than 25 years	50	3	0.149	0.699
25–40	69	3		
Education				
PCL	68	3	0.119	0.730
Bachelor	51	3		
Experience in years				
0–2 years	43	3	0.472	0.492
More than 2 years	76	3		
Working unit				
Critical ward	58	1	2.358	0.125
General ward	61	5		
Training				
No	115	5	2.633	0.105
Yes	4	1		

The study regarding attitude shows there is no association between attitude towards oxygen therapy and selected variables.

Limitation of the study

The study was conducted in a single hospital and might not reflect the knowledge of all the nurses in general which might limit the generalizability of the findings of the study. Also as this study is a cross sectional study, chances of recall bias may be high.

Conclusion

The study revealed that the level of knowledge among nurses regarding oxygen therapy has lower than expected and their knowledge is particularly unsatisfactory in terms of oxygen therapy. There was a gap in knowledge and attitude among the participants. Some of the possible factors were also identified which includes age, education level and experience.

The results of the study can provide a framework for the policymakers to develop and implement educational programs on oxygen therapy for nurses in hospital setting.

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Осведомленность медсестер о кислородной терапии в отдельной районной больнице Непала

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Аннотация. *Актуальность.* Кислородная терапия обычно используется в неотложных и критических случаях и является лечением первой линии во многих критических состояниях. Кислородная терапия — лечение, назначаемое в основном пациентам с гипоксией, при котором подается кислород в концентрации более высокой, чем в атмосфере (> 21 %). Подача кислорода зависит от состояния пациента и, в некоторых случаях, от лечения. Настоящее исследование направлено на оценку уровня осведомленности медсестер о кислородной терапии и изучение связи между уровнем знаний и социально-демографическими данными. *Материалы и методы.* Был использован количественный описательный дизайн исследования. Для отбора 125 образцов использовалась невероятностная целенаправленная выборка. Данные были собраны в течение 6 недель с использованием анкеты для самостоятельного заполнения. Описательная статистика (частота, процент, среднее значение, стандартное отклонение) использовалась для количественного анализа данных, а статистические данные (хи-квадрат) использовались для выяснения связи между уровнем знаний, отношением и выбранными социально-демографическими характеристиками респондентов. *Результаты и обсуждение.* Исследование показало, что 74,4 % медсестер имели неудовлетворительный уровень знаний, 20 % имели средний уровень знаний и 5,6 % имели удовлетворительный уровень знаний о кислородной терапии. Была обнаружена значимая связь между уровнем знаний и возрастом, образовательным статусом и опытом респондентов ($p = 0,001, 0,000, 0,016$). *Выводы.* В результате исследования установлено, что уровень знаний медсестер относительно кислородной терапии ниже, чем ожидалось, и является неудовлетворительным. Результаты исследования могут послужить основой для разработки и реализации образовательных программ по кислородной терапии для медсестер в больницах.

Ключевые слова: кислородная терапия, гипоксия, медсестры, образование

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