Original Article

Self-reported clinical practice readiness of nurses graduating from India: A cross-sectional survey in Uttarakhand

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Abstract:

BACKGROUND AND AIM: Considering lack of data on clinical acumen and clinical practice readiness of graduating nurses in India; this cross-sectional survey was undertaken to assess the self-reported clinical practice readiness of graduating nurses from a selected state in India.

MATERIALS AND METHODS: The survey was conducted at randomly selected public and private nursing institutes in Uttarakahnd, India, during June–July 2017. Total 173 final-year nursing undergraduates were selected through cluster sampling technique and they were asked to report their clinical competencies using a prevalidated and reliable tool, i.e. Comprehensive Nursing Competencies Questionnaire.

RESULTS: The mean competencies score for basic nursing skills was reasonably high (236.5 ± 25.0). However, it was significantly low for the advanced nursing skills (148.7 ± 25.6) and selected basic nursing tasks such as perioperative care, elimination related interventions, and handling of medical equipment (recoding electrocardiogram and using defibrillator). Graduating nurses with younger age and longer duration of clinical placement had higher mean competency score in basic as well as advanced nursing skills ($P < 0.05$). Whereas, nurses studying at private nursing institutes had lower mean competency score for advanced nursing skills ($P = 0.001$).

CONCLUSION: Clinical practice readiness of graduating nurses for basic nursing skills is good. However, it is seriously poor for the advanced nursing skills. This could be because of lack of sufficient clinical learning material, experienced clinical nursing faculty, and poorly equipped nursing skill labs. Nursing regulatory bodies must regularly monitor and ensure that deficiencies are rectified and nursing faculty remain clinically updated and active to produce clinically competent nurses.

Keywords:

Clinical nursing competencies, clinical practice readiness, clinical skills, new graduating nurses, nursing student

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Introduction

Today nursing educational institutions are expected to produce nurses which are clinically practice ready inspite being novice to meet the growing healthcare demands of an aging population, and a projected looming nursing shortage.[1] Average life expectancy has doubled since 1990,[2] which has significantly contributed in increased incidence of noncommunicable morbidity and mortality.[3] This phenomenon has led to looming demand of health-care beds and nursing manpower.

However, unfortunately, there is a global shortage of health workers, in particular nurses and midwives, who represent more than 50% of the current shortage in health workers. Further, the WHO estimates that the world will need an additional 9 million

nurses and midwives by 2030.[4] Developed countries like USA are facing serious shortage of nurses because of aging nursing workforce and decreased nursing program enrollments because of nursing faculty crunch. According to the American Association of Nurses (ANA), 500,000 seasoned nurses will be retiring by 2022 and it is estimated by the U. S. Bureau of Labor Statistics that 1.1 million new nurses will be required for their replacement and avoid shortage.[5] In addition, presently, India alone is facing shortage of more than 2 million nurses.[6]

On the other hand, India is one of top supplies of nurses to gulf and OECD countries, especially USA, Canada, UK, Ireland, Australia, and New Zealand.[7,8] Consequently, production of graduate nurses has significantly expanded in India from just 165 nursing colleges in 2004[9] to 1667 in 2017.[10] This is evident from data that there is very rapid growth in the number of nurses produced in India to meet the national and international needs of nurses; however, there is always challenge to maintain quality with rapid production of quantity. Further, acute shortage of nurses necessitates the readiness of nurses to immediately take-up the full-fledged role as registered nurse to ensure patient safety and quality of care. In addition, recruiters always need to know the degree of readiness of nurses produced from the countries, which are the major suppliers for the nurses. There are number of studies conducted about clinical readiness of nurses graduated from developed countries. However, there are only few such studies conducted in other countries. Single institute-based studies conducted at Italy[11] and Norway[12] reported good level of nursing competencies among graduating nurses. Contrarily, recent studies conducted at Ohio, USA,[13] Victoria, Australia,[14] and Shiraz, Iran[15] reported that graduating nurses were clinical skill deficit and very few of them were possessing entry-level competencies and practice readiness. Surprisingly, there is no data on the clinical practice readiness of nurses produced by these rapidly mushroomed institutes in India. However, one of the blogger mentioned about scarcity of nursing faculty, inadequate skill development and knowledge and lack of collaboration between nursing services and education departments in India.[16] Therefore, this study was planned to assess the clinical practice readiness of graduating nurses in a selected state of India. The findings of this study will not only guide the nurse educators for transforming nursing curriculum but also inform national and international recruiters about status of practice readiness of nurses in a part of country.

Materials and Methods

Study setting and design
This cross-sectional survey was conducted with an aim to assess the clinical practice readiness of nurses graduating from selected public and private nursing institutes in Uttarakhand. It is a fastest growing state in northern part of India. This state has total 20 nursing institutes recognized by the Indian Nursing Council (public-5 and private-15), which are enrolling students in baccalaureate nursing program. Therefore, considering 40% proportionate sample from public and private institutes, total two public and six private nursing institutes were randomly selected for the present study.

Ethical considerations
Before data collection, ethical approval was obtained from the Institute Ethics Committee of All India Institute of Medical Sciences (AIIMS), Rishikesh (AIIMS/IEC/16/119). Participation was voluntary and participants could withdraw consent at any time. At all times, the research adhered to the National Ethical Guidelines for Biomedical and Health Research of India Council of Medical Research (2017).

Participants
Each of the selected institute enroll about 40–60 students annually in the baccalaureate nursing program; thus, total 382 final-year students studying in baccalaureate nursing program of the selected eight colleges were considered as the study population. The study was conducted in the last months of their final year of baccalaureate nursing program, i.e., June–July 2017.

Sample size was estimated using the formula, $(Z_{1-a/2})^2$ (p) (q)/d²,[17] with absolute error of 5%, confidence interval 95% and above, and good level of nursing competency (66.9%);[11] the estimated sample size was 168 participants, whereas considering 10% nonresponse rate, total 185 sample size was considered for the present study. A sampling frame of students studying in final year of baccalaureate nursing program was obtained from selected colleges and desired sample was selected using simple random sampling by obtaining 25 participants from each institute. However, 27 students were either absent on day of data collection or did not compete questionnaire (86.5% response rate); thus, finally data collected from 173 participants were considered for analysis [Figure 1].

Data collection methods and instrument
Self-structured prevalidated and reliable ($r = 0.93$) instrument, i.e., "Comprehensive Nursing Competencies Questionnaire (CNCQ)," was used to assess the clinical practice readiness of graduating nurses. The tool consisted of total 100 essential nursing skills items based on the prescribed curriculum for the baccalaureate nursing program in India, which was divided into two sections, i.e., (i) basic nursing skills
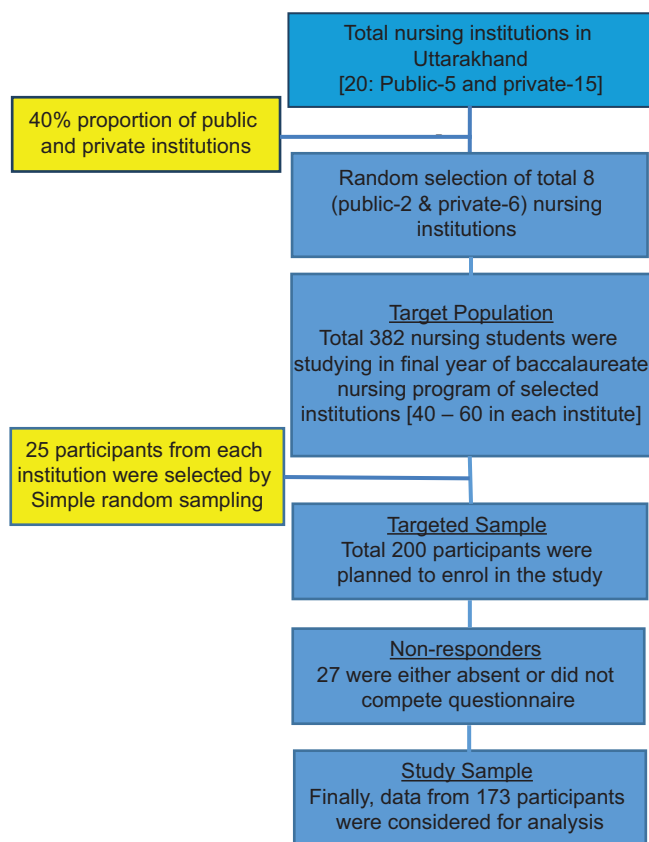
Figure 1: Cluster sampling flow chart

(52 items) and (ii) advanced nursing skills (48 items). Each listed nursing skill practiced during nursing program was measured on six-point rating scale, i.e. perform independently (5), under supervision (4), only assisted (3), only observed (2), only read (1), and don't know anything (0). The basic nursing skill section included total 52 items (with score range: 0–260) under different categories, i.e. admission and discharge, personal hygiene, medication administration, invasive procedures, wound care and bandaging, respiratory nursing interventions, elimination, perioperative nursing, infection control, handling of basic medical equipment, and documentation. Similarly, advanced nursing skills section included 48 items (with score range: 0–240) under different categories, i.e. medical surgical nursing, child health nursing, obstetrical and gynecological nursing, and mental health nursing.

Each participant was handed over the questionnaire in classroom under the supervision of research team and they were asked to first fill sociodemographic data sheet, followed by ranking each nursing skill item based on level of competence they achieved during their nursing program, i.e. perform independently, under supervision, only assisted; only observed, only read theoretically, don't know anything. Participants took about 45–60 min to fill the questionnaire.

Operational definitions

The two terms frequently used in the present study are operationally defined: (i) Clinical practice readiness: Graduating nurses' level of clinical competency for each selected basic and advanced nursing skills, assed on scale of performed independently-5, under supervision-4, only assisted-3; only observed-2, only read theoretically-1, to don't know anything-0). (ii) graduating nurses: Final year baccalaureate nursing students, who were above to compete their nursing program in a month and so.

Statistical analysis

Data were coded and then entered to excel sheets and Statistical Package for Social Sciences (SPSS 21.0) developed by International Businesses Machines Corporation (IBM), New York, USA, was used for statistical analysis. Descriptive and inferential statistics were used for data analysis. Socio-demographic characteristics such as age range, gender, range of percentage of marks obtained in previous academic year and length of clinical experience were presented using frequency and percentage. However, average clinical nursing competency score for basic and advanced nursing skills and their subcategories was analyzed and presented by using mean, standards deviation. Further, independent performance of each selected nursing skill by the participant was presented using percentage distribution. One-way ANOVA or unpaired *t*-test was used to determine association of basic and advanced clinical nursing competencies score with selected sociodemographic characteristics at 0.05 level of significance.

Results

Sociodemographic characteristics

Majority of participants were females (92.5%) with mean age 21.6 ± 1.1 years. Slightly more than half of participants (55%) scored >70% marks in previous university exams. Further, only 60.7% participants had clinical placement throughout the year [Table 1].

Self-reported clinical practice readiness

Overall, CNCQ mean score of basic nursing skills was reasonably high (236.5 ± 25); except some the basic nursing skills. However, overall CNCQ score for the advanced nursing skills was very low (148.7 ± 25.6); further, which was markedly low for the medical surgical nursing skills [Table 1].

It was found that participants with younger age, and who had clinical posting for the longer duration had higher overall CNCQ score for basic and advanced nursing skills (*P* < 0.05). Further, students from public nursing college had higher overall CNCQ score for advanced nursing skills as compared to their counterparts in private institutes (*P* < 0.001) [Table 2].

The response of participants about their independent performance of all the identified basic and advanced nursing skills is presented in Tables 3 and 4.

Discussion

Increasing international and national demand of nurses and growing migration of nurses to developing countries

Table 1: Mean competencies score for nursing skills of participants (*n*=173)

Domains of nursing care skills	Maximum score	Mean±SD	Rank order
Basic nursing care skills	260	236.5±25.0	-
Personal hygiene	30	29.0±2.9	I
Medication administration	35	33.3±3.2	II
Admission/discharge	20	18.3±2.5	III
Respiratory nursing interventions	30	27.0±4.4	IV
Documentation	15	13.5±2.3	V
Invasive procedures#	30	21.4±2.6	VI
Wound care and bandaging	30	25.1±3.8	VII
Infection control and BMW	20	16.5±2.3	VIII
Elimination	25	20.3±3.5	IX
Perioperative nursing	15	11.7±2.8	X
Handling basic medical equipment	15	10.6±2.7	XI
Advanced nursing care skills	240	148.7±25.6	-
Mental health nursing	35	24.4±11.6	1
Child health nursing	70	45.3±6.5	2
Midwifery	70	44.0±8.8	3
Medical surgical nursing	65	35.0±8.7	4
Overall nursing care skills	500	385.2±42.9	-

#Invasive procedure: IV cannulation, venous blood sampling, peripheral blood glucose monitoring, NG tube insertion and feeding. SD=Standard deviation, BWM=Biomedical waste management, IV=Intravenous, NG=Nasogastric

lead to rapid proliferation of nursing institutes offering nursing program especially in private sector.[18] Several reports highlighted the compromised quality of nursing education with this rapid mushrooming such as poor infrastructure, serious teaching staff shortage, inadequate clinical experience for the nursing students.[18-20] New graduating nurses are expected to seamlessly integrate into the role of registered nurse in spite being novice and debate about clinical practice readiness of novice nurses remains palpable across globe. Further, it is more important for India being a major supplier for the nurses internationally and there is an acute shortage of nurses nationally.

However, there is no data about the clinical practice readiness of new graduating nurses in India. Therefore, this state-level survey was conducted to assess self-reported clinical practice readiness of new graduating nurses from state Uttarakhand, India. It was found in the present study that there was reasonably high mean clinical competency score for basic nursing skills (236.5 ± 25.0). However, competency score was very low for the advanced nursing skills (148.7 ± 25.6). Recent studies conducted at Ohio, USA,[13] Victoria, Australia,[14] and Shiraz, Iran[15] also reported clinical skill deficit and lack of adequate practice readiness of graduating nurses, where Kavanagh and Szweda[13] reported that only 23% newly graduate demonstrated entry-level competencies and practice readiness and recommended that nursing faculty must maintain clinical currency like medical faculty to strengthen the practice reediness of nursing students. In our study, low practice readiness for advanced nursing skills primarily could be because

Table 2: Association of nursing competencies scores with selected demographic characteristics of participants (*n*=173)

Demographic variables	n	Basic nursing skills score		Advanced nursing skills score	
		Mean±SD	P	Mean±SD	P
Age					
≤21	81	241.32±17.83	0.000**	150.97±23.96	0.030*
22	65	239.51±18.95		150.91±25.57	
≥23	27	214.74±33.05		136.78±28.14	
Gender					
Male	13	240.54±15.33	0.514	147.00±23.02	0.784
Female	160	236.16±23.67		148.87±25.88	
Institution of training					
Government	95	238.08±22.86	0.319	154.55±29.85	0.001**
Private	78	234.55±23.48		141.65±16.92	
Percentage in previous university exam					
50-59	03	218.33±21.45	0.055*	145.00±16.37	0.201
60-69	75	232.09±26.28		145.36±22.96	
70-79	86	240.78±18.71		150.27±25.59	
>80	9	238.22±27.96		163.44±42.87	
Clinical posting duration					
Throughout the year	105	254.55±12.75	0.000**	165.97±16.91	0.000**
Half of the year	24	249.75±14.67		151.33±29.47	
Only for few months	44	210.02±25.69		131.95±31.67	

**P<0.01, *P<0.05. SD=Standard deviation

Table 3: Percentage of participants independently practiced basic nursing skills (*n*=173)

Admission/discharge		Infection control and BMW		Documentation	
Skills	**Percentage**	**Skills**	**Percentage**	**Skills**	**Percentage**
Vitals sign monitoring	95.9	BMW management	94.2	TPR charting	72.8
Health assessment	83.8	Use of PPE	88.4	Nurse's notes	61.3
Admission of patient	69.9	Disinfection	50.9	Informed consent	59.5
Discharge/discharge teaching of patient	69.4	Fumigation/fogging	01.7		
Hygiene care		**Elimination**		**Innovative procedure**	
Skills	**Percentage**	**Skills**	**Percentage**	**Skills**	**Percentage**
Bed making	94.8	Catheter care	83.8	Veinipuncture	76.3
Oral care	93.6	Suppositories	49.7	PBG monitoring	79.8
Hair care	91.3	Enema	42.8	Venous blood sampling	67.0
Back care	89.6	Urinary catheterization	37.6	NG tube feeding	39.9
Bed bath	84.4	Bowel wash	13.3	NG tube insertion	5.9
Medication administration		**Oxygenation/respiratory care**		**Wound care and bandaging**	
Skills	**Percentage**	**Skills**	**Percentage**	**Skills**	**Percentage**
IV infusion	90.2	Nebulization	95.4	Bandaging	83.2
Intramuscular injection	87.9	Steam inhalation	91.3	Surgical wound dressing	55.5
IV drugs	87.3	O_2 administration by simple face mask	85.1	Bed sore dressing	52.0
Oral drug	84.4	O_2 administration by nasal prongs	75.1	Pin site care dressing	39.9
Subcutaneous injection	82.6	Assisted patient with incentive spirometer	71.7	Removal of sutures and staples	28.3
Intradermal injection	82.6	O_2 administration by partial/nonrebreather /venturi mask	54.3	Burns wound dressing	22.5
Eye, ear, nasal drops instillation	80.9				
Preoperative care		**Handling basic medical equipment**			
Skills	**Percentage**	**Skills**		**Percentage**	
Preoperative care	38.1	Pulse oximeter		79.2	
Postoperative care	32.4	Recoding ECG		34.7	
Intraoperative care	21.4	Using defibrillator		2.9	

ECG=Electrocardiogram, BMW=Bio-medical waste, PPE=Personal protective equipment, TPR=Temperature, pulse and respiration, IV=Intravenous, NG=Nasogastric, PBG=Peripheral blood glucose

most of the private nursing institutions do not owe their parent hospitals and place nursing students in small nursing homes for clinical experience, where students do not get enough opportunity to experience and practice advanced nursing skills.

Further, out of basic nursing skills, mean competency score was highest for the personal hygiene related skills, followed by medication administration, admission and discharge, respiratory nursing intervention, documentation, and invasive procedures such as intravenous cannulation, intravenous blood sampling, peripheral blood glucose monitoring etc., However, it was low for some of the basic nursing skills such as ECG reading, use of defibrillator, perioperative care, infection control, wound care and elimination related nursing skills. Similarly, there was low mean score for all the advanced nursing skills which was lowest for medical surgical nursing skills, followed by obstetric and gynecological nursing and child health nursing. This shows that graduating students are not getting enough opportunity to practice advanced

nursing skills. Similar findings has been reported by other study from Korea.[21] The reason could be lack of clinical learning material, poor student-patient ratio, lack of tertiary care patient services, and high fidelity nursing skill labs.

Longer duration and intense clinical experience contributes in better clinical practice readiness of nurses.[22] Our study reported that participants, who were placed in clinical experience for longer duration reported higher mean competency score for basic as well as advanced nursing skills (P = 0.001). Nursing students studying at public institutes had higher mean score for advanced nursing skills as compared to their counterparts in private hospital (P = 0.001). However, contradictory findings has been reported by a study from Thailand.[23] More than 88% nursing institutions are private in India[18] and most of these do not owe parent hospital, thus place the students in affiliated small nursing homes, where they do not get enough opportunity to experience and practice advanced nursing skills.

Table 4: Percentage of participants independently practiced advanced nursing skills (*n*=173)

Medical surgical nursing		Child health nursing		Obstetrical and gynecological nursing	
Skills	Percentage	Skills	Percentage	Skills	Percentage
Blood transfusion	34.1	Nebulisation	62.4	Perineal care	50.3
Endotracheal/tracheostomy suctioning	24.3	New born assessment	48.5	Assisting the mother with breast feeding	47.4
Tracheostomy care	17.3	Intramuscular injection	37.0	Antenatal care	42.8
Care of central venous catheter	15.6	Immunization	31.8	Postnatal care	39.3
Administration of TPN	15.6	Care of new born	30.6	Antenatal examination	37.6
Colostomy care	15.6	Care of new-born in radiant warmer	27.2	Postnatal examination	26.0
Arterial blood sampling	14.4	IV medication with use of infusion pump	20.2	Nonstress test	20.2
Care of intercostal chest drainage site	13.9	care of new born under phototherapy	19.6	Vaginal examination	19.1
Gastrostomy/jejunostomy feeding	9.8	Administration of oxygen by oxygen tent	18.5	Examination of placenta	13.3
Gastric lavage	6.9	Administration of oxygen by oxygen hood	16.8	Partogram	12.1
BLS	6.3	care of new-born in incubator	13.3	Collection of pap smear	9.8
Care of patient on mechanical ventilator	4.6	Paediatric vein puncture	9.8	Normal vaginal delivery	4.6
Care of patient with cardiac catheterization	1.7	Neonatal resuscitation	4.6	IUCD insertion	3.5
		Paediatric BLS	0.6	Episiotomy and suturing	1.1
Mental health nursing					
Skills	Percentage	Skills	Percentage	Skills	Percentage
History collection	94.2	MMSE	86.1	Process recording	63.0
Behavioural therapy	12.7	Care patient for ECT	11.0	Use of restraints	7.5
Assisting in AT	3.5				

TPN=Total parental nutrition, IUCD=Intrauterine contraceptive device, ECT=Electroconvulsive therapy, AT=Abrasion therapy, MMSE=Mini-mental status examination, BLS=Basic life support, IV=Intravenous

It was a serious finding in the present study that even 50% of graduating nurses could not independently practiced some of the basic nursing procedures such as pressure sore dressing, burns wound dressing, perioperative care, nasogastric tune insertion, NG tube feeding, insertion of suppositories, enema administration, bowel wash, urinary catheterization, removal of sutures, pin site care, fogging, recording electrocardiogram and use of defibrillator. Surprisingly, only few of the participants independently practiced advanced nursing skills in medical surgical nursing, midwifery and child health nursing advanced nursing skills. We astonished to see that not even 10% participants independently practiced some of the advanced nursing skill such as gastrostomy/jejunostomy feeding (9.8%), pediatric venipuncture (9.8%), collection of pap smear (9.8%), gastric gavage (6.9%), basic life support (BLS) (4.6%), neonatal resuscitation (4.6%), pediatric BLS (0.6%), normal vaginal delivery (4.6%), episiotomy (1.1%), care of patient with cardiac catheterization (1.7%). The reason could be less opportunity, and thus low confidence to perform these skills. Woods *et al*.[24] also reported that overall confidence and clinical preparedness of nursing students was high, however they lacked confidence in

venipuncture, assisting in intubation and managing multiple patient assignments. This could be because of lack of opportunity of practice these advanced level of nursing skills or the lack of clinical supervision by nursing faculty.

This clearly shows that graduating nurses from India may be possessing reasonably good level of basic nursing skills but they may be lacking advanced nursing skills especially who are graduating from private nursing institute without a parent teaching hospital. Further, nursing faculty do not maintain clinical practice currency like medical faculty; and students are abandoned in clinical areas to master clinical skills whatever comes-on their way during clinical postings.

Limitations
Despite a rigorous study design, this study still faced some critical limitations. It was a self-reported clinical practice readiness study, so it may have the risk of "*reporting bias.*" In addition, study had a narrow definition of clinical practice readiness as only level of competencies of selected hundred clinical nursing tasks was assessed in the present study.

Conclusion

Graduating nurses had reasonably good level of clinical practice readiness for the basic nursing skills. However, they lacked the competencies in advanced nursing skills. Therefore, regulatory bodies must check that nursing institutes have sufficient facilities and processes for adequate clinical learning experience in basic and advanced nursing skills. Further, nursing faculty must be clinically updated and regularly practice to ensure planned development and mastery of essential clinical competencies among graduating nurses. A countrywide multi-centric study is recommended to be conducted to understand the contributing factors of poor clinical readiness of nurses in India.

Conflicts of interest
There are no conflicts of interest.

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