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SELF-DIRECTED LEARNING READINESS AMONG UNDERGRADUATE NURSING STUDENTS IN A NURSING CAMPUS

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ABSTRACT

Background: Self-directed learning is an instructional strategy, in which learners exercise a great deal of independence in setting learning goals and deciding what is worthwhile learning as well as how to approach the learning task within a given framework. The dynamic and complex patient care environment requires nurses to embrace the concept of self-directed learning. The study aimed to identify the readiness for self-directed learning among undergraduate nursing students.

Methods: A descriptive cross-sectional study design was used to conduct the study among 151 undergraduate nursing students. The stratified proportionate random sampling technique was used to select the sample from the total population. Self-Directed Learning Readiness Scale which is a self-administered, validated standard tool for Nursing Education was used to collect data. The duration of data collection was 2nd February 2023 to 24th February 2023. Data were analyzed by using descriptive statistics such as frequency, percentage, and mean, and inferential statistics such as chi-square.

Results: The mean age of the respondents was 22.4 years and almost all (97.4%) were female. Likewise, 62.9% were from Bachelor of Science in Nursing and 37.1% from Bachelor of Nursing Science. Most (81.5%) had heard about Self-directed learning. The majority of the respondents (66.9%) had a high level of self-directed learning readiness and 33.1% of respondents had a low level of self-directed learning readiness. Similarly, among the three domains, self-control has the highest mean score 58.66 ± 6.61. The level of self-directed learning readiness was significantly associated with age (p=0.029), academic program (p=0.002), and academic year (p=0.010).

Conclusions: The nursing students have self-directed learning readiness. Age, academic year and academic program were statistically significant with the readiness level for self-directed learning.

Key Words: *Self-directed learning, SDLR, nursing students*

INTRODUCTION

Self-directed learning (SDL) is the process by which individuals take the initiative, with or without the help of others, in identifying their learning needs, setting learning goals, identifying human and material resources for learning, selecting and implementing appropriate learning strategies, and evaluating the learning outcome.[1] Readiness is the degree to which the individual possesses the attitudes, abilities, and personality characteristics necessary for self-directed learning.[2] It is to the extent that individuals have the right mindset, skills, capacity, and personality traits required for taking charge of their own learning process. Anyone can become a self-directed learner, but the level of their ability to do so is influenced by factors such as the desire to learn, self-confidence, self-awareness, prior experience, and intelligence which are collectively called readiness for SDL.[3] SDL has become a key focus for nursing students in recent years due to advancements and changes in the nursing profession. It is crucial in a constantly changing environment as it allows nursing students to acquire the skills of independent learning, accountability, responsibility, and

assertiveness, which are essential qualities for nursing professionals throughout their careers. Thus, nursing students should be taught how to take control of their own learning in order to gain a deeper and more lasting understanding of the material.[4] In the constantly evolving healthcare industry, nurses need to continuously update their knowledge and skills beyond their formal education to meet public expectations.[5] As, various studies have been conducted to evaluate nursing students' motivation and readiness for SDL and have revealed varying levels of readiness. Despite the emergence of SDL, there is still a gap in awareness and implementation of this approach in nursing curricula.

METHODS

The descriptive cross-sectional research method was used to find out the Self-directed learning readiness among undergraduate nursing students of Maharajgunj Nursing Campus, Kathmandu. The population of study was all bachelor level nursing students i.e. 255. Among them, 160 students were from Bachelor of Science in Nursing (B. Sc. Nursing) and 95 from Bachelor of Nursing Science (BNS). Both male and female students were included. BNS third-year students were excluded from the study. The sample size for this study was 151 and it was calculated by Using Cochran Formula for Infinite Population at 5.0% allowable error with prevalence of 69.2%.[6] Probability stratified random proportionate technique was used for the selection of the required sample size.

A structured, self-administered questionnaire was used to collect the data, which consisted of two parts. Part one was socio-demographic characteristics and part two was Fisher's Self-Directed Learning Readiness Scale for Nursing Education (SDLRS).[7] SDLRS is a standardized and validated scale developed by Murray J. Fisher. This scale consists of 40 items categorized into three subscales as Self-Management, Desire of Learning, and Self-control. Responses to 36 items are ordinal on a five-point Likert scale format, where Likert-scale type questions are utilized ranging from 1- Strongly disagree, 2- Disagree, 3- Unsure, 4- Agree, and 5-Strongly agree. The other four items are scored in a reverse score (items 3, 11, 20, and 40). Overall scores can range from 40 to 200, with higher scores reflecting stronger readiness for self-directed learning.[7]The content validity of the instrument was established through the use of a modified reactive Delphi technique using experts from the nursing field.[8] In the context of Nepal, it has been used frequently to assess the readiness for self-directed learning among nursing students.[6, 9-11]The internal consistency for each component was estimated using Cronbach's coefficient alpha. The computed values of Cronbach's coefficient alpha for the total 40 items were 0.924 and the self-management subscale, the desire for learning subscale, and the self-control subscale were 0.85, 0.847, and 0.830 respectively.[8]

The total readiness score was calculated as high-level readiness (score>150) and low-level Readiness (score<150).[7]Permission for using the tools had been taken from Murray J. Fisher via email. Pretesting was done among 15 students at the Nepalese Army Institute of Health Sciences, College of Nursing.

The respondents were selected without any discrimination of ethnicity, culture, and socio-economic status. Respondents were provided with the questionnaire only after explaining the purpose of the study and obtaining voluntary written informed consent. None of the respondents were compelled to participate. The obtained information was kept in such a way that only researchers could access it and also ensure that obtained information would be used for research purposes only. The anonymity of the respondents will be maintained by coding the paper of the research questionnaire with numbers. Respondents will not be harmed in any way via words or actions. Confidentiality was maintained by not disclosing respondents' information. During the entire study period, all the ethical considerations were maintained. Written informed consent was obtained from each respondent prior to collecting the data. All the data were reviewed, organized, and coded. Data were analyzed using Statistical Package for Social Sciences (SPSS) Version 16. Descriptive statistics was used to analyze the data and the Chi-square test was applied to measure the association between the self-directed learning readiness and the selected variables.

RESULTS

Socio-demographic and Academic Characteristics

out of 151 respondents, the mean age was 22.4 years and almost all (97.4%) respondents were female. Most of the (88.1%) respondents were unmarried. The majority (77.5%) belonged to nuclear families and 72.8% of the respondents used to live in hostels (Table 1).

Table 1. Respondents' socio-demographic characteristics **n=151**

Characteristics	Number	Percent
Age (in completed years)		
17-22	90	59.6
23-28	53	35.1
≥29	8	5.3
Mean age ± SD: 22.4 ± 2.9		
Sex		
Male	4	2.6
Female	147	97.4
Marital status		
Married	18	11.9
Unmarried	133	88.1
Family type		
Nuclear	117	77.5
Joint	33	21.9
Extended	1	0.7
Types of residence		
With Family	41	27.2
Hostel	110	72.8

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Table 2. Respondents' academic characteristics **n= 151**

Characteristics	Number	Percent
Academic program		
B. Sc. nursing	95	62.9
BNS	56	37.1
Major stream (BNS)		
Adult health nursing	24	42.9
Community health nursing	14	25
Child health nursing	10	17.9
Psychiatric nursing	8	14.2
Academic year		
BSc. first	24	15.9
BSc. second	24	15.9
BSc. third	23	15.2
BSc. fourth	24	15.9
BNS first	27	17.9
BNS second	29	19.2
Academic performance		
Distinction	61	40.4
First	84	55.6
Second	5	3.3
Third	0	0
Fail	1	0.7
The primary source of motivation		
Personal interest	47	31.1
Career development	85	56.3
Self-improvement	18	11.9
Social pressure	1	0.7
Learning environment*		
Adequate availability of resources	100	66.2
Appropriate guidance and feedback from teachers	91	60.3
Available of supportive peer groups	91	60.3
Don't know	15	9.9

**** Multiple responses***

More than half of the respondents (55.6%) had secured first division and 56.3% of the respondents' primary source of motivation for learning was career development. Similarly, the majority (66.2%) said that their learning environment had adequate availability of resources (Table 2).

Table 3. Respondents' responses on self-management domain **n=151**

Items	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree	Median (Q1-Q3)
	No. (%)	No. (%)	No (%)	No. (%)	No. (%)	
I solve problems using a plan	0(0)	6(4)	23(15.2)	108(71.5)	14(9.3)	4(4-4)
I prioritize my work	1(0.7)	4(2.6)	16(10.6)	100(66.2)	30(19.9)	4(4-4)
I do not manage my time well	9(6.0)	60(39.7)	39(25.8)	34(22.5)	9(6.0)	3(2-4)
I have good management skill	2(1.3)	12(7.9)	51(33.8)	74(49.0)	12(7.9)	4(2-4)
I set strict time frames	7(4.6)	42(27.8)	53(35.1)	41(27.2)	8(5.3)	3(2-4)

I prefer to plan my own learning	1(0.7)	6(4.0)	10(6.6)	114(75.5)	20(13.2)	4(4-4)
I am systematic in my learning	1(0.7)	12(7.9)	38(25.2)	86(57)	14(9.3)	4(3-4)
I am confident in my ability to search out information	1(0.7)	8(5.3)	26(17.2)	91(60.3)	25(16.6)	4(4-4)
I set specific times for my study	1(0.7)	25(16.6)	33(21.9)	76(50.3)	16(10.6)	4(3-4)
I am self- disciplined	2(1.3)	7(4.6)	24(15.9)	91(60.3)	27(17.9)	4(4-4)
I am disorganized	34(22.5)	70(46.4)	34(22.5)	12(7.9)	1(0.7)	4(3-4)
I am methodical	1(0.7)	8(5.3)	57(37.7)	76(50.3)	9(6.0)	4(3-4)
I can be trusted to pursue my own learning	1(0.7)	5(3.3)	17(11.3)	109(72.2)	19(12.6)	4(4-4)

Self-Directed Learning Readiness was assessed in three different domains. Regarding the self-management domain, most of the respondents agreed that they preferred to plan their own learning (75.5%) whereas, only 7.9% of the respondents agreed that they were disorganized (Table 3).

Table 4. Respondents' responses on the desire for learning domain **n=151**

Items	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree	Median (Q1-Q3)
	No. (%)	No. (%)	No. (%)	No. (%)	No. (%)	
I need to know why	2(1.3)	1(0.7)	16(10.6)	96(63.6)	36(23.8)	4(4-4)
I critically evaluate new ideas	1(0.7)	6(4)	22(14.6)	97(64.2)	25(16.6)	4(4-4)
I learn from my mistakes	1(0.7)	2(1.3)	5(3.3)	107 (70.9)	36(23.8)	4(4-4)
I am open to new ideas	1(0.7)	2(1.3)	12(7.9)	97(64.2)	39(25.8)	4(5-4)
When presented with a problem, I cannot resolve I will ask for assistance	6(4)	29(19.2)	38(25.2)	68(45.0)	10(6.6)	4(3-4)
I like to evaluate what I do	2(1.3)	3(2)	13(8.6)	114(75.5)	19(12.6)	4(4-4)
I do not enjoy studying	18(11.9)	90(59.6)	24(15.9)	16(10.6)	3(2.0)	4(3-4)
I have a need to learn	0(0)	6(4.0)	10(6.6)	110(72.8)	25(16.6)	4(4-4)
I enjoy a challenge	2(1.3)	8(5.3)	23(15.2)	99(65.6)	19(12.6)	4(4-4)
I want to learn new information	0(0)	2(1.3)	4(2.6)	109(72.2)	36(23.8)	4(4-4)
I enjoy learning new information	1(0)	4(2.6)	4(2.6)	99(65.6)	43(28.5)	4(4-5)
I like to gather the facts before I make a decision	0(0)	2(1.3)	12(7.9)	102(67.5)	35(23.2)	4(4-4)

Regarding the desire to learn domain, themajority of the respondents (75.5%) agreed that they like to evaluate what they do whereas only 10.6% of the respondents agreed that they do not enjoy studying (Table 4).

Table 5. Respondents' responses on self-control domain **n=151**

Items	Strongly Disagree No. (%)	Disagree No. (%)	Unsure No (%)	Agree No. (%)	Strongly Agree No. (%)	Median (Q1-Q3)
I am able to focus on a problem	0(0)	11(7.3)	17 (11.3)	103 (68.2)	20(13.2)	4(4-4)
I prefer to set my own learning goals	2(1.3)	3(2.0)	10(6.6)	109 (72.2)	27(17.9)	4(4-4)
I am responsible	0(0)	2(1.3)	15(9.9)	100 (66.2)	34(22.5)	4(4-4)
I have high personal expectations	1(0.7)	21(13.9)	36 (23.8)	68(45)	25(16.6)	4(3-4)
I have high personal standards	1(0.7)	17(11.3)	51 (33.8)	57(37.7)	25(16.6)	4(3-4)
I have a high belief in my abilities	2(1.3)	13(8.6)	37 (24.5)	75(49.7)	24(15.9)	4(3-4)
I am aware of my own limitation	0(0)	6(4)	16 (10.6)	101 (66.9)	28(18.5)	4(4-4)
I am logical	0(0)	6(4.0)	30 (19.9)	92(60.9)	23(15.2)	4(4-4)
I evaluate my own performance	1(0.7)	3(2)	14(9.3)	109 (72.2)	24(15.9)	4(3-4)
I prefer to set my own criteria on which to evaluate my performance	1(0.7)	3(2.0)	35 (23.2)	95(62.9)	17(11.2)	4(4-4)
I am responsible for my own decisions/action	0(0)	2(1.3)	9(6.0)	112 (74.2)	28(18.5)	4(4-4)
I can find out information for myself	1(0.7)	3(2.0)	22 (14.6)	96(63.6)	29(19.2)	4(4-4)
I like to make decisions for myself	1(0.7)	10(6.6)	13(8.6)	88(58.3)	39(25.8)	4(4-4)
I prefer to set my own goals	1(0.7)	1(0.7)	7(4.6)	102 (67.5)	40(26.5)	4(4-4)
I am not in control of my life	32(21.2)	74(49.0)	20 (13.2)	19(12.6)	6(4.0)	4(3-4)

Concerning about self-control domain, the majority of the respondents (74.2%) agreed that they are responsible for their own decision and actions. Whereas, only 12.6% agreed that they are not in control of life (Table 5).

Table 6. Respondents' responses mean score on each domain **n=151**

Domain	Minimum	Maximum	Mean ± SD
Self-management	29	65	47.79 ± 5.44
Desire for learning	32	59	47.58 ± 4.5
Self-control	43	75	58.66 ± 6.61

The mean score was calculated from the respondents' responses in each domain. The self-control domain had the highest mean score whereas the self-management domain had the lowest mean score (Table 6).

Regarding the respondents' self-directed learning readiness, the majority (66.9%) had a high level of self-directed learning readiness and only 33.1% had low level of self-directed learning readiness (Figure 1). The mean score was 154.03 (± 13.75).

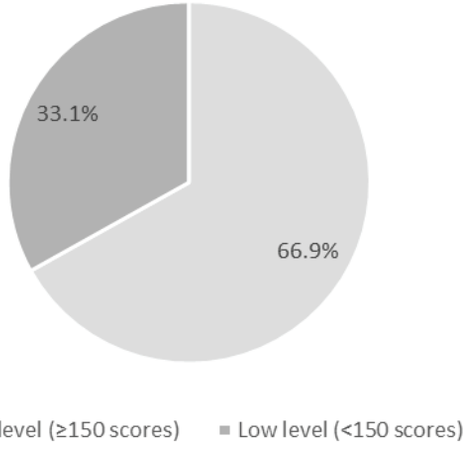

Figure 1. Level of self-directed learning readiness

Table 7. Association between level of self-directed learning readiness and selected variables

Variables	Level of readiness		Chi square	P-value
	High level No. (%)	Low level No. (%)		
Age in completed years			4.77	0.029
≤22	54(60.0)	36(40)		
>22	47(77.0)	14(23)		
Academic program			9.35	0.002
BSc. Nursing	55(57.9)	40(42.1)		
BNS	46(82.1)	10(17.9)		
Academic year				
BSc nursing 1st year	17(70.8)	7(29.2)	15.07	0.010
BSc nursing 2nd year	13(54.2)	11(45.8)		
BSc nursing 3rd year	12(52.2)	11(47.8)		
BSc nursing 4th year	13(54.2)	11(45.8)		
BNS 1st year	19(70.4)	8(29.6)		
BNS 2nd year	27(93.1)	2(6.9)		

Chi-square test was calculated to measure the association between SDLR and selected variables. Academic program, Academic years of BSc. Nursing and Bachelor of Nursing Science program were significantly associated with the p-value 0.029, 0.002 and 0.010 respectively (Table 7).

DISCUSSION

This study was carried out to find out the Self-directed learning readiness of 151 undergraduate students in B. Sc. nursing and BNS at Maharajgunj Nursing Campus under Tribhuvan University.

The present study's findings revealed that the majority (66.9%) of respondents had a high level of self-directed learning readiness. This finding is supported by the finding of the study conducted in Kathmandu where the majority 69.02% had a high level of readiness.[6] Similarly, studies conducted in various parts of Nepal also reported similar findings.[9,11] Likewise, studies conducted in other countries such as Pakistan, Sri Lanka, Iran, and Oman also reported similar findings.[12-15] In general, these findings suggest that students in South Asian countries like Nepal, Pakistan, and Sri Lanka are inclined towards self-directed learning and are ready to take responsibility for their own learning. Overall, the results indicate a growing interest in self-directed learning among students, which could lead to more innovative and effective approaches to teaching and learning. The present study's finding is contradictory to the findings of a study conducted in Saudi which showed a low level of readiness among nursing students.[16]

Self-directed learning readiness in this study was assessed regarding three domains self-management, desire for learning, and self-control. Regarding the result of these three domains, it was found that the highest mean score percentage of the self-control domain was 58.7 ± 6.6 followed by desire for learning (47.8 ± 5.4) and self-management (47.6 ± 4.6). These findings are supported by other similar studies conducted in different parts of Nepal.[9, 11]

Similarly, studies were done in Pakistan, Iran, and Oman.[11,14,15] Self-control is an important attribute that nursing students possess and is consistent across different countries. It is necessary to promote and develop self-control among nursing students to enhance their overall performance and success in their profession. This finding is contradictory to the findings of the study conducted among nurses in Sri Lanka where the domain desire for learning had the highest mean score (53.4).[13] This discrepancy may be due to the differences in characteristics of the population and the working-related factors where there is a lack of continuing education and in-service training programs for nurses within the health care systems of BNS students.

The present study showed that the age of the patient tends to be associated with self-directed learning readiness with a p-value of 0.029. This finding is supported by the study conducted among nursing students in Palpa

and Chitwan of Nepal.[9,11] This shows that increasing age enhances self-directed learning readiness, and it may be due to increased cognitive development, self-regulation, motivation, life experiences, and learning strategies. In contrast to these findings, there was no association between age and self-directed learning readiness in the study conducted among nursing students in Kathmandu, Eastern Nepal, and Pakistan.[6, 17, 12] This discrepancy may be due to the difference in the population characteristics.

Likewise, regarding the association between self-directed learning readiness and academic programs, the present study showed that BNS students had shown more self-directed learning readiness than B. Sc. Nursing students. A similar finding was found in the study done in Iran and Brunei.[14, 18] In contrast, no significant association was seen between academic programs and self-directed learning readiness in the study conducted in Chitwan.[11] It may also be due to the variation in population characteristics and sample size.

Correspondingly, the present study showed a significant association between the academic year and self-directed learning readiness with a p-value of 0.010. A similar finding was observed in a study conducted in Kathmandu and Palpa, Nepal.[6, 9] Studies done on Pakistani and Omani nursing students also reported consistent findings whereas the contradictory findings were seen in the study conducted in India. [12,15, 19] This discrepancy in the study may be due to different settings and populations.

CONCLUSIONS

Nursing students have a high level of self-directed learning readiness. The age, academic program, and academic year tend to be associated with the self-directed learning readiness among nursing students. Self-directed learning readiness is seen as high in the BNS. Thus, the university can act accordingly while reviewing the curriculum.

CONFLICT OF INTEREST

There is no conflict of interest in the study.

REFERENCES

1. Knowles MS. Self-directed learning: a guide for learners and teachers. [Internet]. Available from: https://eric.ed.gov/?id=ED114653
2. Wiley KR. Effects of a self-directed learning project and preference for structure on self-directed learning readiness. Nurs Res.1983 May 1;32(3):181???185. https://doi.org/10.1097/00006199-198305000-00011
3. Cazan AM, Schiopca BA. Self-directed learning, personality traits, and academic achievement. Procedia - SocBehav Sci. 2014 Apr 1;127:640–4. https://doi.org/10.1016/j.sbspro.2014.03.327
4. Nazarianpirdosti M, Janatolmakan M, Andayeshgar B, Khatony A. Evaluation of self-directed learning in nursing students: a systematic review and meta-analysis. Educ Res Int. 2021 Nov 20;2021:1–8. https://doi.org/10.1155/2021/2112108
5. O'Shea E. Self-directed learning in nurse education: a review of the literature. J AdvNurs. 2003 Jun 11;43(1):62–70. https://doi.org/10.1046/j.1365-2648.2003.02673.x
6. Shrestha S, Author_Id N. Readiness for self-directed learning among students of bachelor of science in nursing program of selected colleges in Kathmandu, Nepal. Int J Multidiscip Res and Analysis. 2022 Feb 9;05(02). https://doi.org/10.47191/ijmra/v5-i2-08
7. Fisher M, King J, Tague G. Development of a self-directed learning readiness scale for nursing education. Nurse Educ Today. 2001 Oct 1;21(7):516–25. https://doi.org/10.1054/nedt.2001.0589
8. Fisher M, King J. The self-directed learning readiness scale for nursing education revisited: a confirmatory factor analysis. Nurse Educ Today. 2010 Jan 1;30(1):44–8. https://doi.org/10.1016/j.nedt.2009.05.020
9. Nepal P, Adhikari D. Readiness for self-directed learning among nursing students of Lumbini Medical College and Teaching Hospital: a cross-sectional study. DOAJ. 2021 Dec. https://doaj.org/article/03a65a22b84547c5a8a91adf5541aba1
10. Shankar PR. Readiness for self-directed learning among first-semester students of a medical school in Nepal. Research Gate [Internet]. 2011 Jan 15; Available from: https://www.researchgate.net/publication/271529743_Readiness_for_self_directed_learning_among_first_semester_students_of_a_medical_school_in_Nepal
11. Singh IB, Paudel BK. Readiness for self-directed learning among nursing students in a medical college, Chitwan. J Chitwan Med Coll. 2020 Mar 14;10(1):27–30. https://doi.org/10.3126/jcmc.v10i1.28066
12. Ejaz S. Readiness for self-directed learning among nursing students in Lahore, Pakistan. Research Gate [Internet]. 2018 Aug 31; Available from: https://www.researchgate.net/publication/327337466_Readiness_for_Self-Directed_Learning_among_Nursing_Students_in_Lahore_Pakistan
13. Samarasooriya RC, Park J, Yoon SH, Oh J, Baek SE. Self-directed learning among nurse learners in Sri Lanka. J. Contin. Educ. Nurs. 2019 Jan 1;50(1):41–8. https://doi.org/10.3928/00220124-20190102-09
14. Gebru AA, Ghiyasvandian S, Mohammodi N, Kidane M. A self-directed in learning among undergraduate nursing students' in school of nursing and midwifery, TUMS, Tehran, Iran. Educ J. 2015 Jan 1. https://doi.org/10.11648/j.edu.20150404.13
15. Ballad CA, Labrague LJ, Cayaban ARR, Turingan OM, Balushi SMA. Self-directed learning readiness and learning styles among Omani nursing students: implications for online

learning during the COVID-19 pandemic. Nurs Forum. 2021 Oct 21;57(1):94–103. https://doi.org/10.1111/nuf.12664

16. Alharbi HA. Readiness for self-directed learning: How bridging and traditional nursing students differs? Nurse Educ Today. 2018 Feb 1;61:231–4. https://doi.org/10.1016/j.nedt.2017.12.002
17. Koirala N, Kafle SP. Self-directed learning readiness of the undergraduate nursing students: a study from Eastern Nepal. Birat J Health Sci. 2021 Jun 13;6(1):1263–8. https://doi.org/10.3126/bjhs.v6i1.37553
18. Chakkaravarthy K, Ibrahim N, Mahmud M, Hardaker G, Venkatasalu MR. Determinants of readiness towards self-directed learning among nurses and midwives: Results from national survey. Nurse EducPract. 2020 Aug 1;47:102824. https://doi.org/10.1016/j.nepr.2020.102824
19. Kalyani P K, Elizabeth V, Solomon S, Anna B P, Valerie U, Samuel P P, et al. Self-directed learning readiness of Indian medical students: a mixed method study. BMC Med Educ. 2018 Jun 8;18(1). https://doi.org/10.1186/s12909-018-1244-9