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Level of Self-Directed Learning Readiness (SDLR) in Online Learning among Pharmacy Students in Indonesia

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ABSTRACT

Background: Health science development is currently rapidly changing due to the Covid-19. Changes have taken place not only in terms of scientific development but also in terms of learning methods. Almost all learning methods have shifted into online learning, requiring students to be more active.

Objectives: This study aims to determine the level of SDLR among pharmacy students in Indonesia, especially during the pandemic.

Methods: The sampling was conducted using an proportional sampling technique based on the distribution of Pharmacy Schools (PTF) in all the provinces in Indonesia. The level of readiness of these pharmacy students was measured using a questionnaire that consisted of four domains. The questions were scored according to the characteristics of the questions (negative or positive).

Results: The results of this study showed that 1884 respondents participated in this study. The basic characteristics showed that 89.1% participants were private pharmacy schools and 84.4% of them were female respondents. The mean of each domain of SDLR for self-management, the desire to learn, the emotional competency, and the responsible decision-making was 3.24 ± 2.65, 3.37 ± 2.09, 3.04 ± 1 87, 3.16 ± 2.16, respectively. Based on gender, the difference of mean in sub domain was p=0.000 (need for learning), p=0.002 (hope for outcome), and p=0.000 (identifying problem).

Conclusion: In conclusion, the Self-Directed Learning Readiness (SDLR) among pharmacy students in Indonesia is quite high during the pandemic with a score above 3 (scale 1-4).

Keywords: online learning; pharmacy students; self-directed learning readiness (SDLR)

INTRODUCTION

Health science is currently rapidly developing, especially during a pandemic, where all the learning methods have shifted into distance learning 1. In addition to affecting learning methods, the rapid developments of sciences have also required students to be more active in both learning and seeking additional information to supplement what they have learned in higher education 2. Self-Directed Learning Readiness (SDLR) is a process where individuals will take the initiative, with or without the help of others, to identify learning needs, formulate learning objectives, identify learning resources both from humans and from other materials, to select and implement learning strategies as well as to evaluate learning outcomes3. SDLR (Self-Directed Learning Readiness) is one of the factors that determine students' success in the learning process4. The level of SDLR among health science students is affected by individual attitudes, self-discipline, learning abilities, and desire to learn. Some of these abilities will support the adaptability and long-life learning of health workers in the world of work5.

One study of Self-Directed Learning Readiness (SDLR) was conducted in India on medical students showed that it is necessary to revise the curriculum to cover learning methods that will improve students' SDLR6. A previous study on pharmacy students was conducted at the University of Maryland, it was focused on the

students' readiness to face laboratory practice. The results showed that 44% of students had a quite high level of readiness before conducting the laboratory practice as indicated by the students' activity of making study groups and writing reports. The research also showed that readiness to learn was also influenced by an individual's study habits7. The development of pharmaceutical science requires pharmacy students to be faster in accessing the latest evidence, especially concerning cases that occur in the field. In addition, competencies is also inherent in all health students. With the existence of SDLR, students will have the ability as lifelong learners, and this is a part of andragogy8. Another study in Malaysia regarding the readiness of students to participate in e-learning in Southeast Asia showed that most students were ready to participate in e-learning provided by their respective universities9.

In Indonesia, there are many studies about SDLR during pandemic. One of them is study that conducted in faculty of medicine in Sam Ratulangi University. It is showed that total of 109 students (69.87%) had high SDLR score, 44 students (28.2%) had moderate score, and three students (1.92%) had low score10. Another study about SDLR in Yogyakarta showed that a very weak negative relationship between learners' resilience and their grades11. This study aimed to determine the level of SDLR among pharmacy students in Indonesia, especially during the pandemic, in which most of the learning methods are online based.

METHODS

Study design

This study was cross-sectional research.

Population and samples

Based on Higher Education database from the Ministry of Education, Culture, and Research of Indonesia until August 2020, there were 258 pharmacy schools in Indonesia (public and private schools). The sampling was conducted using an area sampling technique based on the distribution of pharmacy schools in all the provinces in Indonesia. The inclusion criteria were pharmacy schools in Indonesia that had students until the fourth year grade, and willing to take part in this research. Pharmacy school with less than 100 students was excluded based on the consideration that the students were not evenly distributed in all semesters. After excluding pharmacy school based on the number of students, 149 pharmacy school were included. There were a total number of 81000 students at 149 pharmacy school and by using the Slovin formula, the minimum sample size was 1100.

Study instruments

The level of readiness of the pharmacy students was measured using a questionnaire that consisted of four domains, consisted self-management, desire to learn, emotional competency, and responsible decision making. This questionnaire used a Likert scale of 1-4 as well as negative and positive statements (1: strongly disagree, 2: disagree, 3: agree, and 4: strongly agree). The questions were scored according to the characteristics of the questions (negative or positive). The questionnaire was developed by adopting the previous studies1,5,6. The questions of the domains are listed in Table I.

Data collection

A proportional sampling technique was used based on the distribution of pharmacy school in each province. The total 1184 respondents participated in this study.

Data Analysis

The data were analyzed descriptively to describe the level of readiness of pharmacy students in online learning. The relationship between the respondent characteristics and SDLR scores was analyzed using the Student-T test and Linear Regression. The validation and reliability of the questionnaire were tested using the Cronbach alpha value and the r-value of Pearson correlation analysis (n=300). The Cronbach alpha obtained for the Self-management, Desire to learn, Emotional Competencies, and Responsible decision-making domains were 0.743, 0.626, 0.684, 0.834, respectively. Each of which met the reliability criteria (>0.6). The r count obtained for each item in the questionnaire was greater than the r table, thus meeting the validity criteria.

RESULTS AND DISCUSSION

A total of 1884 respondents who spread throughout Indonesia participated in this study. Table II shows the characteristics of the respondents in which 89.1% went to private pharmacy schools, with 84.4% of them

Table I. Questions in the self-management domain

Domain	Indicator (Subdomain)	Code
Self-Management	Time management skill	TMS
	Social networking	SN
	Environment support	ES
	Moral and ethical	ME
	Communication manner	CM
	Ability	A
Desire to Learn	Covering passion	CP
	Enthusiasm for learning	EL
	The need for learning	NL
	Hope the outcomes of learning	HOL
	The ideals to be achieved	IA
Emotional Competencies	Regulation	R
	Collaboration	C
	Connection	C
Responsible Decision Making	Critical Thinking	CT
	Identifying problems	IP
	Analyzing situations	AS
	Evaluation and reflection	ER
	Skills/performance	S/P
	Knowledge	K

Table II. Respondents' Characteristics

Characteristics	n= 1884 (%)	Mean (SD)
Types of Schools		
State Schools	206 (10.9)	
Private Schools	1678 (89.1)	
Gender		
Female	1590 (84.4)	
Male	294(15.6)	
Age		20.28 (2.63)
SDLR Domains (mean and SD using Likert 1-4 scale)		
Self-management		3.24 (2.65)
Desire to learn		3.37 (2.09)
Emotional competency		3.04 (1.87)
Responsible decision making		3.16 (2.16)

were female students. The mean age was 20.2 years. This characteristic was similar with previous studies, where the proportion of female students was more dominant than male students and most of them aged 20-25 years[6,8,9]

The four domains in the questionnaire obtained scores greater than 3, with the lowest score being the desire to learn domain. The results of this study are in line with those of a previous study, that pharmacy students had a high level of SDLR in different situations[8]. Nonetheless, the results of research on SDLR were different in terms of the readiness of pharmacy students to conduct laboratory practicum. There were more students with a low level of SDLR although the difference was not significant.

Table III presents the scores for each question in each subdomain. In the self-management domain, the lowest scores were found in environmental support. A previous study revealed that good time management skills affect the success of the learning process. Time management is a part of self-management, in which students are required to have the ability to manage their personal needs based on abilities and priorities. In addition, time limitation requires students to be able to improve their learning performance[12]. Based on the study in Kupang, it is showed that the use of the social interaction tool was positively associated with students' academic success, the perceived ease of using the social presence tool was negatively associated with students' success. Students are reliant on themselves in the online learning environment, and they may have a better chance of academic

Table III. Distribution of mean of Subdomain in Self-directed Learning Readiness

Domain	Subdomain	Mean (SD) (n=1884)
Self-Management	Time management skill	2.97 (0.37)
	Social networking	3.21 (0.38)
	Environment support	2.88 (0.58)
	Moral and ethical	3.07 (0.63)
	Communication manner	2.94 (0.46)
	Ability	3.16 (0.44)
Desire to Learn	Covering passion	2.74 (0.56)

success[13]. Another study demonstrated that SDLR is influenced by environmental elements such as the teacher-student connection, the facilitation process, and the availability of learning resources, as well as motivational factors such as academic performance, interest in topics, and the fulfillment of self-expectations[14].

Based on the desire to learn domain, enthusiasm for learning obtain the lowest score. Meanwhile, in the emotional competence and responsible decision-making domains, critical thinking and analyzing situation ability had the lowest scores. Support for learning readiness during the pandemic is very crucial to conduct distance learning. The presence of facilities such as mobile phones, laptops or computers, and the internet is the key to properly conduct learning processes. As has been known, not all regions in Indonesia have equally good access to the internet, preventing the learning process to run well. In addition to facility support, supports for the learning process in the form of clear learning objectives, appropriate assessments, workloads given by lecturers, and good teaching methods are also important in conducting distance education[15].

The desire to learn domain determines a student's ability as a lifelong learner[5]. Pharmacy students should have the ability as lifelong learners regarding the rapid changes in health science[8,16]. Therefore, the low score for the enthusiasm for learning subdomain should be a concern for both lecturers and the management degree program. It is necessary to further explore the factors that potentially lower enthusiasm for learning. Heavy workloads, uninteresting learning models, and complicated assessment methods may affect the enthusiasm for learning.

Table IV shows significant differences in the scores of certain domains based on the types of schools. The scores for the emotional competence domain and several sub-domains on private pharmacy schools were higher than those of state pharmacy schools. The presence of differences in the domain and subdomain scores based on the types of pharmacy schools indicated the desire of pharmacy students to achieve better results. This study was the first study that showed the differences between public and private pharmacy schools. Various things can lead to the differences in the scores of the domains and subdomains of SDLR, including the level of stress due to adapting to the distance learning process, the pandemic conditions that require everyone to stay at home to maintain health which then restricts social life, as well as increased tasks with a certain time limit, thus causing students to lack time to live a healthy life, rest and work out[16]. The types of schools also determine the quality of the human resources. Lecturers' readiness in facilitating distance education should pay attention to not only the materials to be delivered to students, but also the condition of the students who will have to understand the materials and complete various assignments at the same time. Therefore, there were various factors caused by the types of schools that led to the differences in the results, in addition to differences in the number of students in public and private schools. There was one study of which the result is in line with this study, especially in terms of the time management section. Private schools obtained higher scores significantly for time management than public school [12].

Table V presents significant differences in the subdomain scores based on gender, where the score for the need for learning and hope for outcome subdomains among female students was higher than that among male students. The result is also in line with previous research on the students of health study programs in which the SDLR scores of female students were better than male students[17]. In addition, according to the situation in each country, female students usually have more social responsibilities than male students, so they are used to identifying problems and learning new things to find solutions to these problems[12].

The results of the linear regression analysis between the respondents' age and the domain scores showed a significant relationship in the subdomains of social networking and skill performance with p values of 0.04 and 0.01. A previous study conducted on the students of the health study program also showed similar results, where senior students had better SDLR scores than junior students. This study also showed that the demographic characteristics of the students such as gender, previous educational background, and personal characteristics

Table IV. Differences between domain and subdomain scores based on the types of pharmacy institutions status

Domain	Public school of pharmacy (mean, SD)	Private school of pharmacy (mean, SD)	P-value
Emotional competencies	2.75 (0.34)	3.05 (1.97)	0.029*
Subdomain	PTN (mean, SD)	PTS (mean, SD)	P-value
Time management	2.85 (0.40)	2.98 (0.36)	0.000*
Social networking	3.13 (0.35)	3.22 (0.39)	0.002*
Moral Ethic	2.89 (0.85)	3.09 (0.63)	0.000*
Communication manner	2.86 (0.37)	2.95 (0.46)	0.006*
Covering passion	2.46 (0.57)	2.77 (0.55)	0.000*
Enthusiasm of learning	2.44 (0.65)	2.65 (0.63)	0.000*
Ideals to be achieved	3.40 (0.37)	3.49 (0.34)	0.003*
Self-regulated	2.60 (0.47)	2.85 (0.44)	0.000*
connection	2.71 (0.44)	2.83 (0.45)	0.000*
Critical thinking	2.52 (0.48)	2.78 (0.44)	0.000*
Identifying problem	2.88 (0.41)	3.00 (0.35)	0.000*
Situation analysis	2.88 (0.41)	2.97 (0.39)	0.002*
Evaluation and reflection	2.61 (0.54)	2.81 (0.48)	0.000*
Skill performance	3.09 (0.42)	3.18 (0.410)	0.002*

Table V. Differences in subdomain significance based on gender

Subdomain	Male (mean, SD)	Female (mean, SD)	*p* value
Need for learning	3.19 (0.50)	3.31 (0.46)	0.000
Hope for outcome	3.56 (0.43)	3.65 (0.40)	0.002
Problem identification	3.03 (0.40)	2.98 (0.34)	0.000

greatly affected the SDLR level of the students in the first year. This should be of concern for both lecturers who teach in the first year and academic supervisors, to be able to implement various learning strategies and methods.

Table VI presents the total score per domain both at the national level and based on the types of pharmacy school. It can be concluded that the scores for the domains of SDLR among the students at private pharmacy school of were higher than those at the national level. This is possible because private schools had a higher proportion of students.

Figure 1 shows the proportion of the students of which the SDLR scores were above the national average. It was only in terms of the desire to learn domain that the students of private pharmacy schools had a better proportion than public pharmacy school. Although the students from private schools had better scores in terms of the domain and subdomain scores than the students from public schools, public schools had a higher number of students whose scores were above the national average. This indicates that the students from public schools made better efforts for SDLR. These efforts can be made by the students in terms of the adaptation process and by the educational institutions in terms of improving facilities and infrastructure. In addition, public schools may have previously applied distance learning, encouraging students to have better readiness to participate in the distance learning process during the pandemic.

Several factors that can determine the level of SDLR among students in the health sector in Indonesia, based on a previous study are curriculum, lecturer experiences, student background, and cultural factors in a country. Improvements to the curriculum and the ability of lecturers to change the student-based learning process will improve SDLR. In the context of learning during the pandemic, it is not only changing the learning method from face-to-face meetings to online learning but also maintain the concept of student-based learning. In some situations, a particular study program that has always become a favorite study program over generations and lecturer experiences determine the success of the study, which certainly will affect the SDLR of students[16]. A previous study on medical students at several public universities also showed that the proportion of students with a high SDLR was 44-62%[16].

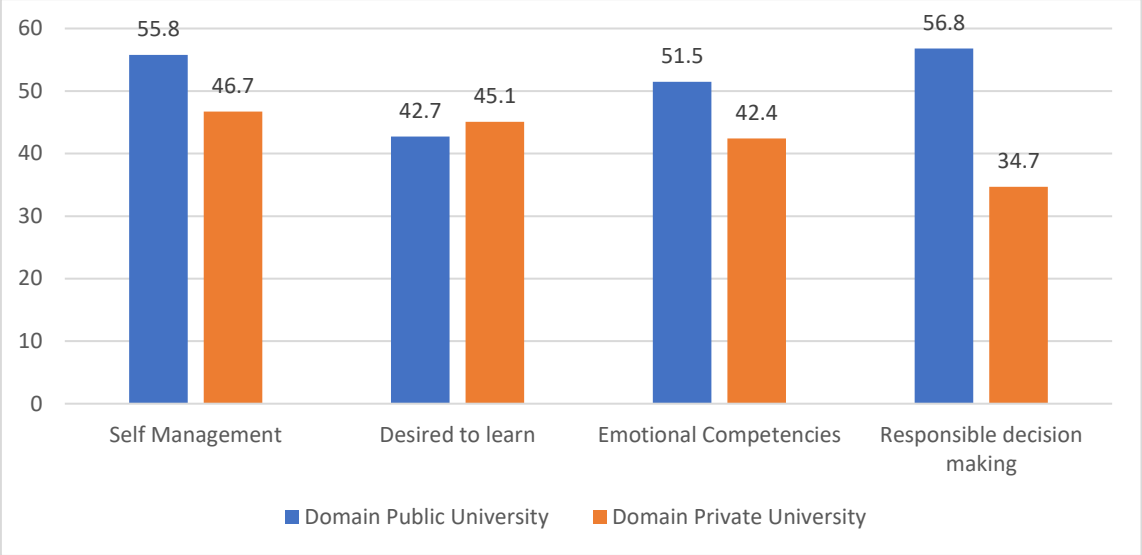

Figure 1. The proportion of SDLR Scores of Each Domain on National SDLR Scores

Table VI. SDLR domain scores at the national level and based on the types of schools of pharmacy

Domain	National Mean (SD)	Public University Mean (SD)	Private University Mean (SD)
Self-Management	36.44 (3.40)	35.60 (3.38)	36.54 (3.39)
Desire to learn	28.92 (2.67)	28.00 (2.57)	29.04 (2.67)
Emotional Competencies	25.83 (2.87)	24.74 (3.09)	25.96 (2.82)
Responsible decision making	29.96 (3.13)	28.88 (3.06)	30.09 (3.11)

This study had a strength, i.e. a national survey was conducted, allowing the results of the study to descriptively represent pharmacy students in Indonesia. In addition, the questionnaire used in this study was adopted from various previous studies on the students from the health study program of which the validity and reliability had been tested. However, this study also had a limitation, i.e. the number of private schools involved was higher than the number of public schools, possibly affecting the results of the statistical analysis.

CONCLUSION

In general, the pharmacy students in Indonesia have a quite high level of SDLR during the pandemic with a score greater than 3 (scale 1-4). It is necessary to conduct future studies regarding some domains with a quite low level of SDLR. Future research needs to explore the factors of the low level by considering both student readiness and the facilities and infrastructure of educational institutions.

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STATEMENT OF ETHICS

This research was conducted with ethical approval from Ahmad Dahlan University No. EC:012010054.

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