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Article

Locus of Control and Self-Directed Learning Readiness of Nursing Students During the COVID-19 Pandemic: A Cross-Sectional Study from Saudi Arabia

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Abstract: Background: Coronavirus disease (COVID-19) has caused one of the worst global pandemics in recent decades. It has disrupted education systems worldwide, leading to a forced shift from traditional face-to-face to blended or fully distanced learning, requiring a higher level of student readiness for self-directed learning (SDL) and a more internal locus of control (LOC). Objective: This study explored the relationship between locus of control and level of readiness for SDL among Saudi nursing students and whether the COVID-19 pandemic has impacted this relationship. Methods: a cross-sectional correlational descriptive study was conducted to survey 277 Saudi nursing students enrolled in the bachelor program in one of the reputable universities in Saudi Arabia. An E-questionnaire containing two scales, the Self-Directed Learning Readiness Scale for Nursing Education, and the Locus of Control Scale, was used to collect data in addition to the selected participants' characteristics. Results: Nursing students had a moderate-to-low level of readiness for SDL (mean = 144.0), and the majority had an external LOC. There was a significant association between locus of control and level of readiness for self-directed learning ($r = 0.19^*$, $p = 0.001$), and the internal locus of control was more significantly associated with self-directed learning ($r = 0.22^*$, $p = 0.0001$) than with external locus of control. Conclusion: The study findings indicate a propensity of respondents towards an external locus of control, whereas the majority of the respondents reported low to moderate levels of readiness across all dimensions of self-directed learning. This study was not registered.

Keywords: locus of control; self-directed learning readiness; nursing students; Saudi Arabia; undergraduates; COVID-19 pandemic

1. Introduction

INTRODUCTION:

The coronavirus disease (COVID-19) pandemic has dramatically altered education worldwide. The disruption caused by COVID-19 compelled academic institutions to focus their efforts on facilitating a swift and unexpected transition to online education and assessment [1]. These efforts have resulted in a substantial rise in e-learning, whereby teaching and learning activities occur remotely via digital platforms, including nursing education [2]. The abrupt closure of educational institutions left students confused and greatly affected their academic schedules, performance, and achievements [3,4]. Moreover, it is likely to influence all aspects of university students' lives worldwide [5], and nursing students are no exception [6]. Disruptions caused by COVID-19 induced heightened stress and anxiety [7] and have affected students' educational requirements. [3,8]. In

Saudi Arabia, the unscheduled closure of schools and universities commenced on 9th March 2020, to control the spread of coronavirus, prompting universities to take swift action.

To continue teaching and learning during the COVID-19 pandemic while complying with preventative protocols and measures, universities worldwide have been urged to develop online courses with reformed content and innovative teaching methods within a relatively brief timeframe [9]. Nursing education institutions have transitioned from traditional face-to-face instruction to virtual modes [10]. This shift to virtual education necessitated the rapid conversion of content previously delivered in person to an online format, with limited opportunities for students to engage in clinical practice, as is customary in traditional nursing curricula [6]. The adoption of this mode of education introduced innovative approaches to assessment, compelling students to quickly adapt to the challenges of attending virtual classes and successfully fulfilling assessment requirements.

In this context, students must consider new methodologies for organizing, preparing, and engaging in their studies. This resulted in heightened levels of independence and self-direction in completing course requirements. Self-directed learning is one of the strongest predictors of improved learning outcomes and academic achievement among students undergoing education in online environments [11]. Extensive research has demonstrated that locus of control (LOC) and self-directed learning (SDL) are pivotal factors influencing students' performance and online learning readiness [12].

Locus of control pertains to the extent to which individuals believe they possess control over their own lives [13], while SDL refers to the degree of responsibility a learner accepts for their own educational journey [14]. SDL is the most significant criterion that enables nursing students to cultivate professionalism, a critical attribute for future success [15]. Distance learning provides meaningful learning by encouraging students to take charge of their education and manage various circumstances to achieve academically [16]. As a psychological construct, the LOC motivates students to learn. However, a global pandemic may affect LOC [17] potentially affecting academic achievement [18,19].

SDL and LOC have been recognized as prerequisites for lifelong learning, enabling individuals to continuously and critically appraise the knowledge acquired in an ever-changing world characterized by the influx of new evidence [20,21]. This aligns with the challenges posed by the COVID-19 pandemic [6]. Within the domain of nursing education, the adoption of lifelong learning strategies leads to a better quality of education and professional competence, fostering the development of professional values among nursing students [22] and ultimately contributing to improved nursing care outcomes [21,23]. Such traits correlate significantly with and are in congruence with the goals of Saudi Vision 2030 - a plan to enhance healthcare and education.

One of the predominant repercussions of the COVID-19 pandemic has been the onset of various psychological challenges, including stress and anxiety, also affecting higher education students [24]. The prevalence of perceived stress among students during COVID-19 was reported as high as 35%, with many experiencing moderate to extreme levels of anxiety [25]. Concomitantly, recent literature indicates that locus of control significantly correlates with perceived stress among students [26,27] and influences students' learning outcomes [28], especially the internal locus of control, which is considered a prerequisite for high academic performance [29].

In response to numerous calls for an exploration of the impact of the COVID-19 pandemic across all sectors, especially health and education, extensive research has been conducted to investigate students' readiness to embrace SDL [30–32], while others have focused on the impact of locus of control [33,34]. However, a literature gap exists concerning whether locus of control impacts the level of SDL among nursing students during the COVID-19 pandemic. Accordingly, the current study aims to address this gap in the literature by exploring nursing students' levels of readiness for SDL and the nature of their LOC. In the current global context, where many nursing schools utilize online learning platforms, students are compelled to exercise self-direction in their learning, making this study's potential contribution more valuable than ever. To the best of our knowledge, this is the first study to link students' LOC with SDL within the realm of nursing education during the COVID-19 pandemic in Saudi Arabia, thereby offering novel insights to nursing educators, academic leaders,

educational psychologists, and policymakers concerned with nursing students' learning and achievement.

BACKGROUND:

SDL plays a crucial role in preparing college students for postgraduate life [35]. It is an educational approach increasingly used in higher education, entailing the learner assuming responsibility of their own learning. The extent of control in this process depends on the learner's attitudes, abilities, and personality characteristics. SDL finds widespread application in problem-solving contexts, contractual arrangements, distance learning, and clinical documentation [36]. Cheng et al. noted that SDL involves the learner, with or without external support, in formulating learning objectives, selecting appropriate learning strategies, diagnosing learning needs, identifying learning resources, and evaluating learning outcomes [37].

SDL offers numerous advantages to nursing students, including the development of independent learning skills [38]. It fosters purposeful change, essential for effective personal and professional life [39]. Moreover, SDL enhances students' self-confidence and motivation [22,40,41]. Lee et al. identified an important direct influence of SDL on the professional values of nursing students [22]. The findings of this study should encourage nursing educators to promote SDL among nursing students, especially in light of the new generation's proficiency in using the Internet and other information sources. SDL has been studied in various countries, including Italy, Brunei, China, and Turkey, with researchers consistently noting a strong correlation between SDL use and positive educational outcomes.

Assessing nursing students' levels of self-direction can be achieved through the measurement of their levels of self-directed learning readiness (SDLR) [42]. A study conducted at Al-Jouf University in Saudi Arabia revealed that 77% of nursing students demonstrated high levels of SDLR [38], which positively correlated with academic performance in undergraduate nursing students [43]. Alsufyani et al. discovered that SDLR was affected by factors such as the gender, age, and clinical experience of nursing students, although another study reported no significant gender-based differences in SDLR scores [44].

Rotter expounded on the concept of LOC in a psychological context, referring to individuals' beliefs regarding their control over causality, situations, and life experiences [45]. In education, LOC refers to how students interpret the factors contributing to their academic successes or failures. LOC is categorized into internal and external types by Rotter [45]. Internally orientated individuals believe that their behavior is primarily guided by their personal decisions and efforts, whereas those with an external LOC attribute their behaviors to external factors.

Locus of control exhibits a significantly positive association with academic achievement [18], a crucial aspect for students [46]. Moreover, LOC plays a critical role in motivating learning [47]. Studies [48], [49], and [50] revealed that students with a high internal LOC are more likely to persevere in online education and achieve superior academic outcomes compared to those with an external LOC. By contrast, Harrell and Bower found no significant relationship between LOC and student perseverance in online learning [51]. Bahçekapılı and Karaman concluded that external LOC has a negative and insignificant relationship with students' academic achievement [52]. Arkan et al. examined the influence of SDL and LOC on nursing students and found that students with high levels of internal LOC are better prepared for SDL in a traditional classroom setting compared to students with low levels of internal LOC, regardless of their year of study [15].

Aim of the Study

This study aimed to explore whether a relationship exists between LOC and the level of readiness for SDL among nursing students during the first wave of the COVID-19 pandemic contingency.

Research Questions:

RQ 1: What is the nature of the nursing students' locus of control?

RQ 2: What is the level of readiness for self-directed learning among nursing students?

RQ 3: Is there a relationship between locus of control and readiness for self-directed learning among nursing students during the COVID-19 pandemic?

2. Materials and Methods

2.1. RESEARCH DESIGN

This study utilized a cross-sectional correlational descriptive design to elucidate relationships among variables, refraining from making inferences of causality [53].

2.2. RESEARCH SETTING

This study transpired at the Nursing College, at one of the reputable universities in Saudi Arabia, during the academic year 2020–2021. All nursing students enrolled in the 3rd through 8th levels of the bachelor's program who were available during data collection were invited to participate in the study. Convenience sampling was employed for participant selection.

2.3. PARTICIPANTS

The total number of nursing students enrolled in the nursing bachelor's program at King Saud University during the 2020–2021 academic year (target population) was 967 (497 females, 470 males). The sample size was calculated using the Raosoft website's sample calculator. A total of 276 participants were needed to achieve an effect size of 0.3 (medium), a level of significance (α) of 0.05, and a test power ($1 - \beta$) of 0.95. An additional 5% of participants were invited to account for attrition and/or withdrawal resulting in 290 participants being invited to participate.

2.4. INCLUSION CRITERIA

The study included nursing students (both male and female) enrolled in the 3rd to 8th levels who were available during data collection and willing to participate.

2.5. STUDY INSTRUMENTS:

A structured self-report questionnaire was used to collect the data and comprised three parts. The first part assessed participants' demographic characteristics, including variables such as age, marital status, academic level, permanent residence, and years of experience.

The second part utilized the Self-Directed Learning Readiness Scale for Nursing Education, developed by Fisher et al. [36] and revised and validated by Fisher and King [54]. This scale was initially developed to assist nursing educators in diagnosing students' attitudes, abilities, and personality characteristics necessary for SDL. The scale comprises 40 items grouped into three categories: self-management ($n = 13$), desire for learning ($n = 12$), and self-control ($n = 15$). A five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used to measure the students' responses. Reverse scoring was implemented for negatively stated statements (e.g., strongly agree to strongly disagree). The overall scores ranged from 40 to 200, with higher scores reflecting a stronger readiness for SDL. The scale's validity and reliability have been assessed in various nursing education studies [36,54–56], with Cronbach's alpha values between 0.70 and 0.85.

The third part of the questionnaire used the Locus of Control Scale, developed by Dag [57] adapted from Rotter's Internal-External Locus of Control Scale [45]. This scale evaluates whether individuals believe that the consequences of their actions are controlled by themselves (Internal LOC) or by external forces (External LOC). The scale comprises 47 items divided into five categories addressing factors such as personal control (18 items), belief in chance (11 items), meaninglessness of effort (10 items), belief in fate (3 items), and belief in an unjust world (5 items). Responses were ranked on a 5-point Likert scale (1 = not at all suitable to 5 = fully suitable). A higher score indicated a stronger belief in external LOC. The internal consistency of the original scale was assessed in previous studies

and found to be consistent, with a Cronbach's alpha value of 0.92 and a Pearson's product-moment correlation test value of $r = 0.88$ [57].

Cross-cultural and linguistic adaptation of the Locus of Control Scale adhered to Beaton et al.'s guidelines for cross-cultural adaptation of self-report measures [58]. For construct validity, two bilingual nursing professionals independently translated the scale into English and then performed blind back-translation into Turkish. Subsequently, the scale was reviewed by three academic and two professional experts proficient in both Turkish and English, who compared the back-translations to the original. Google Forms facilitated the administration of online surveys.

A pilot study involving 10 students was conducted to assess the linguistic clarity and cultural coherence of the scales with respect to the Saudi Nursing Academic culture and related nursing practices. No issues were reported by the students regarding questionnaire clarity or relevance; hence the pilot test responses were included in the study. The internal consistency analysis for both scales yielded a Cronbach's α of 0.91 for the locus of control survey and 0.86 for the self-directed learning scale. The CHERRIES Checklist for electronic surveys [59] was followed.

6. DATA COLLECTION PROCEDURE:

Upon obtaining approval from the Standing Committee for Scientific Research Ethics at King Saud University, and in accordance with COVID-19 restrictions and the university's epidemic prevention and control policies, all students were approached online, as physical contact was not possible. The college's scientific research unit coordinated with researchers and academic advising committee members to disseminate the online questionnaire link to nursing students who consented to participate. Academic-level coordinators were provided with the e-survey links to share with students via their academic email addresses. Data collection transpired over a 12-week period from January to March 2021.

7. ETHICAL CONSIDERATIONS:

Approval for the study was granted by the Bioethical Committee of the Institutional Review Board of the researchers' university (IRB log number: #####). Additional approval was obtained from the vice deanship for academic affairs, academic advisors, academic-level coordinators, and faculty members instructing undergraduate nursing students at academic levels 3rd through 8th. Permission to obtain information regarding the study and the participants' informed consent were translated into the LOC scale, and both LOC and RSDL were adapted from the authors. Participants were required to click "agree" to indicate not only their comprehension of the study's purpose, nature, benefits, and usage of data but also their voluntary agreement to participate. To ensure anonymity, no names or personally identifiable information were captured in the survey responses, indicating that the respondent's IP addresses, usernames, contact information (e.g., email addresses), or respondent tracking functionality were not used in creating the survey, and those with access to the responses could not associate a response with a respondent's identity [59].

8. STATISTICAL ANALYSIS:

Data were coded and analyzed using SPSS version 21 (IBM Corp., Armonk, NY, USA). Continuous quantitative variables were described after assessing their normal distribution, which was evaluated using the Shapiro-Wilk test. For variables displaying a normal distribution, means (\bar{X}) and standard deviations (SD) were calculated. Nominal categorical variables are described using frequencies (f) and percentages (%).

For RQ1 and RQ2, descriptive statistics, including frequencies, percentages, means, standard deviations, and minimum and maximum values were employed to summarize participants' demographic characteristics and assess their levels of RSDL and LOC. For RQ3, inferential statistics were applied. Pearson product-moment correlation analysis was used to ascertain the relationship between students' LOC and their readiness for SDL. A statistical significance threshold was set at $p \leq 0.05$.

3. Results

3.1. Descriptive Analysis:

Out of the 290 student participants, 277 completed the electronic survey, yielding a response rate of 95.5%. Table 1 presents an overview of the demographic characteristics of participants. Female students constituted 57% of the participants, whereas 43% were male. The mean reported age was 20.5 (± 1.6) with the majority (98.6%) being single. Regarding academic level, 29.2% were at Level 6, 23.5% were at Level 7, 16.2% at Level 4, 14% at Level 3, and 10.8% at Level 5. Most participants were residents of Riyadh City and resided in their family homes (92.4%).

Table 1. Demographic Characteristics of the Study Sample (n=277).

Item		Number (%)
Gender		
Male		119 (43)
Female		158 (57)
Age	Mean	20.51 \pm 1.6
Marital Status		
Single		273 (98.6)
Married		4 (1.4)
Academic level		
Level 3		39 (14.1)
Level 4		45(16.2)
Level 5		30 (10.8)
Level 6		81(29.2)
Level 7		65 (23.5)
Level 8		17 (6.1)
Residence		
Riyadh		255 (92.4)
Outside Riyadh		20 (7.2)

RQ 1: What is the nature of the nursing students’ locus of control?

Locus of control consists of five subscales: personal control, belief in chance, meaninglessness of effort, belief in fate, and belief in an unjust world. Table 2 shows that participants reported higher mean scores for external LOC (X = 86.2, SD = 19.7) than for internal LOC (X = 56.38, SD = 1.45), indicating that participants in this study believed that external factors or forces such as luck would determine their outcomes. The findings revealed that a higher mean score was reported for personal control (X = 56.38, SD = 1.45), followed by belief in chance (X = 32.21, SD = 7.97), belief in meaningless effort (X = 29.37, SD = 7.61), belief in an unjust world (X = 14.76, SD = 3.79), and belief in fate (X = 9.87, SD = 2.61).

Table 2. Results of Locus of Control Subscale Among the Study Sample.

Locus of control	Minimum	Maximum	Mean (SD)
Subscales			
Personal control	18	90	56.38 (14.47)
Belief in chance	11	55	32.21 (7.97)

Meaningless of the effortfulness	10	50	29.37 (7.61)
Belief in fate	3	15	9.87 (2.61)
Belief in unjust world	5	25	14.76 (3.79)
Internal locus of control	18	90	56.37 (1.45)
External locus of control	29	235	86.2 (19.7)

RQ 2: To what extent are nursing students ready for self-directed learning?

SDL was assessed using three subscales: self-management, desire for learning, and self-control. Results showed that almost 60% of participants reported a low level of readiness for SDL (144 ± 0.49), while 40% reported a high level. For the subscales, the highest mean score was for self-control ($X = 52.36$, $SD = 12.45$), followed by desire for learning ($X = 45.02$, $SD = 10.38$), and self-management ($X = 39.52$, $SD = 9.04$) (Table 3).

Table 3. Self-Directed Learning Among the Study Participants ($n = 277$).

SDL Subscales	Minimum	Maximum	Mean (SD)	Level	# (%)
Self-management	13	65	39.52(9.04)	Low High	227 (81.9) 50 (18.1)
Desire for learning	12	60	45.02 (10.38)	Low High	121 (43.6) 156 (56.4)
Self-control	15	75	52.36 (12.45)	Low High	157 (56.7) 120 (43.3)
Total level of readiness for SDL	40	200	144.0 (0.49)	Low High	166 (59.9) 111 (40.1)

High level of readiness > 150, Low level of readiness < 150

3.2. Inferential Analysis:

RQ 3: Is there a relationship between LOC and readiness for self-directed learning among nursing students during the COVID-19 pandemic?

Correlation analysis demonstrated a significant association between the locus of control and level of readiness for SDL ($r = 0.19^*$, $p = 0.001$), with the internal locus of control showing a more substantial association with SDL ($r = 0.22^*$, $p = 0.0001$) than the external locus of control, which exhibited no statistically significant association ($r = 0.10$, $p = 0.08$). Moreover, the self-directed learning subscales displayed statistically significant correlations with all the locus of control subscales. Table 4 presents the results of correlation analyses.

Table 4. Correlation Analysis Among the LOC Subscales and SDL Readiness Subscales.

SDL readiness subscales	Locus of control subscales					Overall LoC
	Personal control	Belief in chance	Meaninglessness of the effortfulness	Belief in fate	Belief in unjust world	
Self-management	$r = .38^*$ $p = (.0001)$	$r = .26^*$ $p = (.0001)$	$r = .25^*$ $p = (.0001)$	$r = .37^*$ $p = (.0001)$	$r = .33^*$ $p = (.0001)$	X
Desire for learning	$r = .33^*$ $p = (.0001)$	$r = .20^*$ $p = (.003)$	$r = .21^*$ $p = (.002)$	$r = .36^*$ $p = (.0001)$	$r = .24^*$ $p = (.001)$	X
Self-control	$r = .40^*$ $p = (.0001)$	$r = .24^*$ $p = (.001)$	$r = .22^*$ $p = (.001)$	$r = .39^*$ $p = (.0001)$	$r = .26^*$ $p = (.0001)$	X

Overall Level of readiness for self-directed learning	Internal LOC	External LOC	X
	r =.22*	r = .10	r = .19*
	p = .0001	p = .08	p = .001

*p ≤ 0.05

4. Discussion

To the best of our knowledge, this study marked the first attempt to explore LOC and RSDL among nursing students in Saudi Arabia during the COVID-19 crisis. SDL is a critical component of problem-solving abilities [60] and significantly contributes to building clinical competence in nursing students. The primary aim of this study was to scrutinize the nature of LOC and level of readiness for SDL among Saudi nursing students during the initial wave of the COVID-19 pandemic. Additionally, we explored whether there existed an association between LOC and SDL readiness. The robustness of this study ensues from its pioneering use of the English version of the Locus of Control Scale, initially developed by Dag [57], following its cross-cultural adaptation and validation for Saudi culture, all within the context of the COVID-19 pandemic contingency. These findings underscored a noteworthy association between the study variables. During the COVID-19 pandemic, the internal locus of control exhibited a significant decrease among the student population, while the external locus of control increased. This finding aligns with previous studies conducted in similar COVID-19 situations. For instance, external LOC was more prevalent among university students compared to internal LOC. This finding is consistent with those of Misamer et al. [61], Wali et al. [62], and Hammoud [63], who observed that most of their study participants displayed a higher external LOC than internal LOC, and there was a substantial shift from internal to external LOC during the initial wave of the COVID-19 pandemic. This phenomenon can be attributed to the challenging nature of the pandemic and accompanying rapid changes in all learning experiences, leading students to experience heightened stress. In response, those with external LOC tend to react emotionally and withdraw from stressful situations (such as the COVID-19 pandemic) compared to individuals with internal LOC, who demonstrate greater adaptability to stress and employ problem-solving strategies to mitigate its impact [62].

Regarding the level of readiness for SDL, the current study revealed that nearly 60% of the participating nursing students exhibited a low level of readiness. This finding is consistent with those of Ballad et al. [30], Nazarianpirdosti et al. [64], and Dogham et al. [65]. Conversely, the current findings contradict the conclusions of Samarasooriya et al. [66] and Alsufyani et al. [42], who posited that previous clinical experience and self-reliance among bridging program students or registered nurse (RN) students were significantly associated with high levels of SDL readiness. In this context, a previous systematic review by Nazarianpirdosti et al. [64] suggested that SDL appears to be insufficient. Furthermore, nursing students generally reported moderate levels of readiness for SDL.

Concerning the dimensions of SDLR readiness, the findings revealed that self-control was the most influential subscale when compared to self-management and the desire to learn. This finding corroborates those of Kaur et al. [67], Aljohani & Fadila [68], and Ballad et al. [30], who found that the majority of participating Indian, Saudi, and Omani students reported high self-control scores. This indicates that nursing students are fully cognizant of and responsible for their learning processes [30]. The current findings indicate that nursing students are proficient at managing their own conduct in pursuit of their goals and ideals, as well as effectively handling their learning in the context of the online educational platforms (LMS-Bb) available during the pandemic [69]. In contrast, students demonstrated fewer abilities, attitudes, and personality characteristics related to SDL.

Regarding the association between LOC and SDL readiness level among student participants, the current findings revealed a significant link between LOC and SDLR, particularly concerning the internal locus of control. This internal LOC exhibited a significant positive association with SDLR and all its dimensions and subscales, including self-control, self-management, and the desire to learn. This finding aligns with those of Sidola et al. [70], Syahputra & Affandi [71], Javidkar et al. [72] and Arkan et al. [15], who identified a significant positive association between internal LOC and academic

self-regulation (self-control) among student participants. This indicates that student with an internal LOC demonstrated low to moderate levels of readiness for SDL and relied on external circumstances to control their achievements. This association implies that students with an internal LOC exhibit limited control over their behaviors, emotions, and thoughts in pursuit of long-term goals. More specifically, they possess diminished abilities to monitor and manage their emotions, thoughts, behaviors and energy in ways that are conducive to their well-being, learning, and academic success [70].

In terms of desire to learn and self-management, the findings of the current study revealed a significant positive association between an internal LOC and the desire to learn and self-management. After referring to the literature, the researchers considered students' motivation to learn and self-efficacy as predictors of their desire to learn in comparison to the current findings. Rafique et al. [73] indicated that students who were internally controlled exhibited a greater readiness towards SDL in terms of learning motivation compared to those with an external LOC. This indicates that students possessing an internal LOC were more confident in executing their study plans, seeking timely assistance, managing their time, setting learning goals, and had higher expectations for their learning performance. Consequently, they were more innovative, motivated, and more inclined to share their ideas with their colleagues and teachers. They also demonstrated effective self-management and a genuine interest in learning. In contrast, externally controlled students lacked these attributes and relied more on external support to achieve their goals [73].

Limitations:

The generalizability of the findings is limited as the setting was a single nursing college, convenience sampling was employed, and the sample size was relatively small. Data were obtained using a cross-sectional self-report e-questionnaire, wherein dependent and independent variables were measured simultaneously. Therefore, it cannot provide sound information regarding the causal relationships among the investigated variables. Furthermore, this study focused on the relationship between LOC and SDLR and did not consider external variables that may affect students' SDL, such as mood, health status, and gender. Consequently, further longitudinal studies are required. Additionally, the causes of students' external control and lack of SDL readiness have not been explored, and the findings rely heavily on the COVID-19 crisis as the main precipitating factor.

Recommendations:

Based on the results of this study, several recommendations are proposed. Universities and administrators should work on developing policies for mentoring and counseling students to improve their loci of control. Institutions of higher education can establish sessions including presentations and classes on variables affecting the locus of control and enhancing SDL readiness. Nursing educators should be encouraged to create a conducive learning environment for implementing SDLR, promoting increased confidence, autonomy, motivation, and preparation for lifelong learning. Developing a systematic program led by specialists in mind coaching to increase internal locus of control is advised. Further research should explore external variables that influence students' LOC and SDLR skills.

Nursing students can use the SDL process to review and improve their learning processes [22]. Evidence suggests that SDL plays a positive role in nursing education and is significantly associated with academic achievement [74], professional competence, communication self-efficacy [75], assertiveness and accountability [64], and clinical competencies [76]. Given the importance of SDL in nursing education, nursing educators should motivate students to effectively utilize SDL skills. Furthermore, as SDL plays a pivotal role in fostering clinical competence among nursing students, the necessary measures should be taken to encourage this form of learning. In this regard, nursing professors must train their students and impart SDL skills before incorporating them into the curriculum. They can improve the quality of nursing education and teaching methods by adopting problem-based and student-centered curricula. Since the level of SDL in nursing students falls short of the desired level, future studies should investigate the factors influencing the development of students' readiness for SDL and evaluate the effect of educational interventions on SDL rates. Qualitative studies are required to investigate the factors that facilitate and inhibit SDL.

Further Studies:

Future studies should replicate this study using different target settings and populations, including nursing and non-nursing health colleges. Although these findings are applicable at the target-setting (college) level, they can be replicated both nationally and internationally.

Conclusion:

The overview of the preceding findings from the study indicates a propensity among respondents towards an external locus of control. The majority of the respondents scored low across all dimensions of readiness for SDL. Regardless of the SDL dimensions, the majority of the respondents displayed a low level of readiness for SDL, with self-control being the most impactful dimension compared to self-management and the desire to learn. This finding indicates that nursing students have the capability to regulate their conduct based on their goals and can manage their learning effectively considering the availability of necessary resources. Correlation analysis of the data revealed a significant positive correlation between the internal locus of control and readiness for SDL. Thus, the majority of student participants with an external LOC may benefit from educational administration and academic staff cultivating a learning environment that enhances their confidence in executing their study plans, seeking timely assistance, time management, goal setting, and higher expectations for learning performance. This would make them more innovative, motivated, inclined to share ideas with colleagues and teachers, adept at effective self-management, and keen on learning.

Thus, the results of this study advocate for the promotion of an internal locus of control among nursing students to foster their development as self-directed learners, a trait often considered positive and known to enhance nurses' potential to achieve their targeted goals. Moreover, the internal locus of control significantly contributes towards all three dimensions of readiness for SDL as well as the overall readiness of the participating nursing students. This underscores the importance of the internal locus of control in enhancing SDL approaches among nursing students, thereby enhancing life-long learning, achieving greater clinical competence, and attaining success.

Relevance To Clinical Practice:

The abrupt transformation of educational methods and learning experiences during the COVID-19 pandemic gave rise to conflicts between students and educators. From a more optimistic perspective, the COVID-19 contingency created new opportunities to improve university education systems. These improvements impacted all educational systems, including nursing education, and were implemented while considering numerous factors. First, nursing educators had to transition from the traditional in-class system to a self-directed learning experience, fostering students' creativity, interactivity, and innovative learning by enhancing their SDL skills. Second, it encouraged students to augment their autonomy in learning, directing them to acquire knowledge in a relevant and meaningful manner. Third, curricula and academic policies should undergo annual review and development. Moreover, SDL readiness can be cultivated and enhanced through various mechanisms, such as promoting students' awareness of their own SDL skills, employing learning contracts, embracing learning approaches that stimulate creativity, innovation, critical thinking, and independence, implementing contemporary teaching and assessment strategies that promote SDL, and providing the necessary technical and administrative support systems.

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