# Internet addiction, self-directed learning, and Self-esteem among nursing students during COVID 19 Pandemic

**Ola El-Sebaie Badr**[1], **Heba Mohamed Abdelaal** [2], **Esraa Elsayed Rushdan**[3]

(1,3) Nursing Education, Faculty of Nursing, Alexandria University.
(2) Psychiatric Nursing, Faculty of Nursing, Alexandria University

## Abstract

**Background:** COVID-19 pandemic causes a lot of restrictions to prevent the virus spread as converting to distance education which negatively affect the psychosocial status of adolescents. Nursing students commonly used the internet for different social purposes in addition to participating in distance learning. So,the average daily time spent on the internet during the pandemic increased matched to the pre-pandemic era, which has increased the risk of internet addiction, at the same time may increase nursing students' levels of self-directed learning to achieve their learning goals which chronologically may increase their self-esteem levels. **Aim of the study:** This study aims to investigate the prevalence of Internet Addiction (IA) among nursing students and its association with their Self-Directed Learning (SDL) and Self-Esteem during COVID 19 Pandemic **Setting:** This study was carried out at the Faculty of Nursing, Alexandria University in all its departments, online through Microsoft teams' platform. **Subjects:** The subjects of this study comprised of 358 students who selected by stratified sample method from all nursing students (N = 1704) at the second semesters of the academic year 2020-2021. The sample size was selected using stratified sample method and distributed according to proportional allocation technique. **Tools:** Three tools will be used for data collection Tool I: Self Rating Scale of Self-Directed Learning (SRSSDL), Tool II: Internet addiction Scale, and Tool III: Rosenberg Self-esteem Scale. **Results**: The present study found that, 43.3% of students suffered from moderate level of internet addiction. Also, there was a statistically significant correlation between internet addiction and self-esteem negatively. In addition, to the reverse relation between internet addiction and self-directed learning (SRSSDL). It can be **concluded** that Internet addiction among students was established to be associated with different psychiatric disorders such as low self-esteem, and academic disorders such as low self-directed learning however it can be modified by motivation either intrinsic (goal achievement) or extrinsic (faculty and family members). **Recommendations**: Educational workshops should be conducted to all nurse educators about importance of nursing students' time management planning. Also, training of nursing students how to manage deprivation from their social environment, school, and physical activities throughout information literacy training program.

## Introduction

The outbreak of Corona virus (COVID-19) pandemic affected educational activities worldwide, leading to the widespread closures of schools and transition to distance learning. It changes learning strategies by relying more on using technology in education. These changes make learners assigning more responsibility of their learning and depending on themselves (Sen & Onyema, 2020). Moreover, the explosion of knowledge, rapid development of technology and the accelerated rate of changes in all aspects of life have led to transformation in education (Brem, et al. (2021). Guglielmino, 2013). Formal education and training no longer

effectively assist students to meet future learning desires (Miklos&Elens, 2019; Chu &Weng, 2011). So, attention has been shifted to lifelong continuous learning which is achieved through self-directed learning approaches (Douglass & Morris, 2014; Sulasiwi, 2019).

Moreover, Engagement in SDL is essential for personal and professional fulfillment, developing high quality of live and empowering learners to respond and adapt to changes (Ors,2018; Jeon& Park, 2021). It can foster curiosity, increase confidence, autonomy, self-esteem, and motivation (Dangprasert, 2021). Also, it develops the ability of learners to assess their knowledge

deficits then search for relevant resources and helps them address those deficits as well as to develop necessary skills for lifelong learning (Demirel&Tekkol,2018; Karimi et al, 2010).

On the other hand, the Internet has numerous activities that attract its users, the Internet displays a chance to communicate with people all over the world without any restriction, and young adults have become an important goal of this commercial concern. There has been a tremendous growth of Internet use all over the world, and this is anticipated to continue with its use, becoming an essential part of daily life. Completing work, playing games online, reading and writing emails, and engaging in communication are common activities involving Internet use, Internet activities and technologies that are increasing rapidly have attracted young adults, leading to excessive use of the Internet and maladaptive Internet attitude known as "Internet addiction" (Shirinkam, 2016, Akin, 2011).

The term "addiction", even traditionally utilized to describe a physical dependence of substances, has been applied to the excessive use of the Internet. Internet addiction disorder is expressed as too much computer use that contradicts daily activities and can harm daily function. Various studies showed that adolescents are the most exposed group to Internet addiction as they carry communication with others on social network sites rather than the actual contact in real life (Chen, 2020, Khiat, 2015). University students are thought to

be at a hazardous risk to excessive Internet use worldwide. Internet addiction among these students was established to be associated with different psychiatric disorders such as depression, stress, anxiety, low self-respect, low self-esteem, and low psychosomatic well-being. (Abdel-Salam et al. 2019, Nazir, 2013).

Therefore, this paper will be intended to investigate the prevalence of Internet Addiction (IA) among nursing students and its association with their Self-Directed Learning (SDL) and Self-Esteem during COVID 19 Pandemic.

## Subjects and Methods

### Design, setting, and participants

A descriptive correlative design was conducted using a cross-sectional online survey of undergraduate nursing students at Faculty of Nursing, Alexandria University in Egypt.

The subjects of this study comprised of 358 Students from all nursing students (N=1704) at the second semesters of the academic year 2020-2021. The sample size was estimated using epidemiological information 7 software (EPi info 7 software) using the following parameters: Population size 1704, Expected frequency 50%, Accepted error 5%, Confidence coefficient 95%, Sample size rounded number 358. It was selected using stratified sample method and distributed according to proportional allocation technique. The response rate of the questionnaire was 21% as illustrated in table (1).

**Table 1:** Students' distribution in the study

| Academic level | Total students' number | Target students | Responded students | Percent from total sample size (358) | Response rate for each level |
|---|---|---|---|---|---|
| **First level** | 512 | 105 | 147 | 41.1% | 28.7% |
| **Second level** | 330 | 68 | 94 | 26.3% | 28.4% |
| **Third level** | 398 | 81 | 67 | 18.7% | 16.8% |
| **Fourth level** | 464 | 96 | 50 | 14.0% | 10.8% |
| **Total** | 1704 | 350 | 358 | 100% | Total response rate 21% |

### Data collection Tools

Data of the current study were collected through online survey. Survey was developed using Microsoft Office Form however, the survey accessed by any email type. Questions were grouped on several consecutive screens;

therefore, each tool is presented in one screen. Moving forward and backward among screens was allowed. The required answering option was applied to all questions. The link was posted on several channels and groups that are accessed only by the faculty students, with instruction and

explanation of the study aims. The link was first posted on 20th May 2021, reminders were posted day after day, and the data collection ended on 20 June 2021.

**Tools**: Three tools were used for data collection.

**Tool I: Self Rating Scale of Self-Directed Learning (SRSSDL)** This scale was developed by Williamson (2007). It was used to assess level of nursing student's self-directed learning. This tool was adapted by A.Elmegeed (2012) for nursing students at faculty of nursing Alexandria University, its content validity was tested by five experts from faculty of nursing Alexandria University and tested for internal consistency using cronbach alpha, and the efficient value was 0.72. It consists of 60 items. Students' responses were measured on the 5-point Likert scale as follows; always (5), often (4), sometimes (3), seldom (2), never (1). The scoring system of this tool was ranged from 60-300 distributed as follows: from 60 to 140 indicates low level of self-directed learning, from 141 to 220 indicates moderate level of self-directed learning and from 221to 300 indicates high level of self-directed learning.

**Tool II: Internet addiction tool (IAT):** This tool was originally designed by Young (1998). It's used to assess the prevalence rate of internet addiction among nursing students. The IAT has been validated in a study conducted in faculty of nursing Alexandria University by Ibrahim (2015). And tested for internal consistency using cronbach alpha, and the efficient value was 0.95. It is a self-rated test that contains 20 items. Each item was scored on a scale of 0-5. As 0 means (Does not apply) to 5 (Always). A three categorical score was given to describe the level of Internet addiction as following: a score of 20-49 suggests controlled or average usage (mild addiction), a score of 50-79 suggests occasional or frequent problems (moderate addiction); and a score of 80-100 suggests significant problems (severe addiction).

**Tool III: Rosenberg self-esteem scale**
**It consisted of two parts.**

**Part (1):** This was originally designed by Rosenberg (1995). It's used to assess nursing students' self-esteem level. The tool was tested for its content validity by Abd-Elaziz

(2020) and internal consistency using cronbach alpha, and the efficient value was 0.948. All items are answered using a ٣-point Likert scale format ranging from always (3), sometimes (2) never (1). It consists of ten statements. A two category was used to describe students' self-esteem level low self-esteem from 10 t0 20 and high self-esteem from 21 to 30

**Part (2):** Personal and academic data, it included data about the nursing students' personal and academic data such as age, sex, academic year and, last GPA

## Results

**Table (2)** indicates the distribution of studied nursing students in relation to demographic and academic data. It was noticed that, more than half of the study sample (53.4%) were between 20 to 22 years old, also (67.3%) of them were females. Almost all of them (98 %) were singles. While 41.1% of nursing students in the study sample were in the first academic year, and only about one quarter of them (26.3%) were in the second year. About two third of them (60.6%) register from 16 to 18 hours. And in relation to GPA at last semester, it was found that the vast majority were between B to B+ (26.3%-22.6%) respectively. Also, about half of them (49.4%) had a cumulative GPA from 2 to 3 credit points.

**Table (3)** shows the number and percent distribution of the studied nursing students according to their levels and scores of internet addiction. It was observed that more than half (51.4%) of them had mild level, while less than half (43.3%) of them had moderate level of internet addiction.

**Table (4)** shows the relation between internet addiction and demographic and academic data. It was found that there was a statistically significant difference in relation to academic achievement in the last semester GPA, as P value =0.005. also, it was observed that more than half (52.6%) of nursing students who had c+ had sever addiction.

**Table (5)** appears distribution of the level of self-esteem among studied nursing students and their scores. It was found that about three quarters (71.8%) of them had high self-esteem level.

**Table (6)** shows the relation between self-esteem and demographic and academic data. There was no statistically significant difference.

**Table (7)** illustrates the distribution of the studied nursing students according to their levels of Self-Rating Scale of Self-Directed Learning (SRSSDL). It appears from the table that more than half (52.5%) of the nursing students had high level of self-directed learning, comparing to less than half of them (46.4%) had moderate level of it.

**Table (8)** shows the mean scores of Self-Rating Scale of Self-Directed Learning (SRSSDL) of the studied nursing students. It was observed that the nursing students had high mean score regarding all aspects of self-directed learning (Interpersonal skills followed by, evaluation, awareness, learning strategies, and learning activities), (69.73, 68.96, 67.44, 66.64, and 64.75) respectively.

**Table (9)** shows the relation between self-rating scale of self-directed learning (SRSSDL) and demographic and academic data. It was found that there was a statistically significant difference in relation to academic achievement in the last semester GPA as P value =0.041.

**Table (10)** illustrates the relation between self-esteem and internet addiction. It was observed that about two third of (59.5%) nursing students who had mild level of addiction had high self-esteem level. Also, about two third of them (60.4%) who had moderate level of addiction had low level of self-esteem. There was a statistically significant difference in nursing students who had low self-esteem and moderate internet addiction.

**Table (11)** illustrates the relation between self-rating scale of self-directed learning and internet addiction. It was observed that the majority of (59.5%) nursing students who had high self-rating scale of self-directed level had mild level of addiction, in the other hand, less than half of them (40.0%) who had moderate level of addiction had low level of self-rating scale of self-directed learning. There was a statistically significant difference in nursing students who had moderate internet addiction 40.0% of them had low level of SRSSDL, 53.0% had moderate level of SRSSDL, while 34.8% of them had high level of SRSSDL. As there is reverse relation between internet addiction and SRSSDL

**Table (12)** represents the correlation between internet addiction, self-directed learning among nursing students. It was found that, there was a statistically significant correlation between internet addiction and self-esteem negatively as r = -0.360, P value= 0.001. While in relation to self-esteem and self-directed learning there was a statistically significant correlation positively as r = 0.471, P value= 0.001.

**Table (2):** Distribution of the studied nursing students according to demographic and academic data (n = 358)

| Demographic and academic data | No. (n = 358) | % |
|---|---|---|
| **Age** | | |
| ≤20 | 133 | 37.2 |
| 20–22 | 191 | 53.4 |
| ≥23 | 34 | 9.5 |
| Min. – Max. | 18.0 – 29.0 | |
| Mean ± SD. | 20.30 ± 1.63 | |
| Median | 20.0 | |
| **Sex** | | |
| Male | 117 | 32.7 |
| Female | 241 | 67.3 |
| **Marital status** | | |
| Single | 351 | 98.0 |
| Married | 7 | 2.0 |
| **Academic level** | | |
| First | 147 | 41.1 |
| Second | 94 | 26.3 |
| Third | 67 | 18.7 |
| Fourth | 50 | 14.0 |
| **Number of registered hours** | | |
| Less than 12 hours | 11 | 3.1 |
| 12–15 hours | 31 | 8.7 |
| 16–18 hours | 217 | 60.6 |
| 19–21 hours | 99 | 27.7 |

| Demographic and academic data | No. (n = 358) | % |
|---|---|---|
| **GPA last semester** | | |
| A | 4 | 1.1 |
| A- | 23 | 6.4 |
| B+ | 81 | 22.6 |
| B | 94 | 26.3 |
| B- | 45 | 12.6 |
| C+ | 58 | 16.2 |
| C | 25 | 7.0 |
| C- | 21 | 5.9 |
| D+ | 6 | 1.7 |
| F | 1 | 0.3 |
| **Cumulative GPA** | | |
| Less than 2 | 8 | 2.2 |
| 2 – less than 3 | 177 | 49.4 |
| 3– 4 | 173 | 48.3 |

**Table (3):** Distribution of the studied nursing students according to scores of Internet addiction (IA) (n = 358)

| Internet addiction (IA) | No. | % |
|---|---|---|
| Mild addiction (20–49) | 184 | 51.4 |
| Moderate addiction (50–79) | 155 | 43.3 |
| Severe addiction (80–100) | 19 | 5.3 |
| **Total score (20–100)** | | |
| Min. – Max. | 21.0 – 100.0 | |
| Mean ± SD. | 50.55 ± 16.37 | |
| Median | 49.0 | |
| **Mean score** | | |
| Min. – Max. | 1.05 – 5.0 | |
| Mean ± SD. | 2.53 ± 0.82 | |
| Median | 2.45 | |
| **% Score** | | |
| Min. – Max. | 1.25 – 100.0 | |
| Mean ± SD. | 38.19 ± 20.46 | |
| Median | 36.25 | |

**Table (4):** Relation between Internet addiction (IA) and demographic and academic data

| Demographic and academic data | Internet addiction (IA) | | | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|---|---|
| | Mild addiction (n = 184) | | Moderate addiction (n = 155) | | Severe addiction (n = 19) | | | |
| | No. | % | No. | % | No. | % | | |
| **Age (years)** | | | | | | | | |
| <20 | 70 | 38.0 | 56 | 36.1 | 7 | 36.8 | | |
| 20–22 | 92 | 50.0 | 89 | 57.4 | 10 | 52.6 | 3.660 | 0.454 |
| ≥23 | 22 | 12.0 | 10 | 6.5 | 2 | 10.5 | | |
| **Sex** | | | | | | | | |
| Male | 53 | 28.8 | 56 | 36.1 | 8 | 42.1 | 2.862 | 0.233 |
| Female | 131 | 71.2 | 99 | 63.9 | 11 | 57.9 | | |
| **Marital status** | | | | | | | | |
| Single | 180 | 97.8 | 153 | 98.7 | 18 | 94.7 | 2.109 | [MC]p= 0.328 |
| Married | 4 | 2.2 | 2 | 1.3 | 1 | 5.3 | | |
| **Academic level** | | | | | | | | |
| First | 81 | 44.0 | 60 | 38.7 | 6 | 31.6 | | |
| Second | 48 | 26.1 | 40 | 25.8 | 6 | 31.6 | 11.091 | [MC]p= 0.079 |
| Third | 26 | 14.1 | 39 | 25.2 | 2 | 10.5 | | |
| Fourth | 29 | 15.8 | 16 | 10.3 | 5 | 26.3 | | |
| **Number of registered hours** | | | | | | | | |

| Demographic and academic data | Internet addiction (IA) | | | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|---|---|
| | Mild addiction (n = 184) | | Moderate addiction (n = 155) | | Severe addiction (n = 19) | | | |
| | No. | % | No. | % | No. | % | | |
| Less than 12 hours | 10 | 5.4 | 1 | 0.6 | 0 | 0.0 | 11.429 | $^{MC}$p= 0.058 |
| 12–15 hours | 19 | 10.3 | 12 | 7.7 | 0 | 0.0 | | |
| 16–18 hours | 109 | 59.2 | 98 | 63.2 | 10 | 52.6 | | |
| 19–21 hours | 46 | 25.0 | 44 | 28.4 | 9 | 47.4 | | |
| **GPA last semester** | | | | | | | | |
| A | 1 | 0.5 | 3 | 1.9 | 0 | 0 | 34.376* | $^{MC}$p= 0.005* |
| A- | 12 | 6.5 | 9 | 5.8 | 2 | 10.5 | | |
| B+ | 40 | 21.7 | 38 | 24.5 | 3 | 15.8 | | |
| B | 48 | 26.1 | 45 | 29.0 | 1 | 5.3 | | |
| B- | 28 | 15.2 | 15 | 9.7 | 2 | 10.5 | | |
| C+ | 29 | 15.8 | 19 | 12.3 | 10 | 52.6 | | |
| C | 17 | 9.2 | 7 | 4.5 | 1 | 5.3 | | |
| C- | 5 | 2.7 | 16 | 10.3 | 0 | 0.0 | | |
| D+ | 3 | 1.6 | 3 | 1.9 | 0 | 0.0 | | |
| F | 1 | 0.5 | 0 | 0.0 | 0 | 0.0 | | |
| **Cumulative GPA** | | | | | | | | |
| Less than 2 | 4 | 2.2 | 4 | 2.6 | 0 | 0.0 | 4.705 | $^{MC}$p= 0.291 |
| 2 – less than 3 | 91 | 49.5 | 72 | 46.5 | 14 | 73.7 | | |
| 3– 4 | 89 | 48.4 | 79 | 51.0 | 5 | 26.3 | | |

$\chi^2$: **Chi square test**          MC: **Monte Carlo**

*: Statistically significant at $p \leq 0.05$

**Table (5):** Distribution of the studied nursing students according to scores of Self-esteem scale (n = 358)

| Self-esteem scale | No. | % |
|---|---|---|
| Low (10–20) | 101 | 28.2 |
| High (21–30) | 257 | 71.8 |
| **Total score (10–30)** Min. – Max. Mean ± SD. Median | 10.0 – 30.0 22.78 ± 4.25 23.0 | |
| **Mean score** Min. – Max. Mean ± SD. Median | 1.0 – 3.0 2.28 ± 0.42 2.30 | |
| **% Score** Min. – Max. Mean ± SD. Median | 0.0 – 100.0 63.91 ± 21.25 65.0 | |

**Table (6):** Relation between Self-esteem scale and demographic and academic data

| Demographic and academic data | Self-esteem scale | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | Low (n = 101) | | High (n = 257) | | | |
| | No. | % | No. | % | | |
| **Age (years)** | | | | | | |
| <20 | 39 | 38.6 | 94 | 36.6 | | |
| 20–22 | 54 | 53.5 | 137 | 53.3 | 0.450 | 0.799 |
| ≥23 | 8 | 7.9 | 26 | 10.1 | | |
| **Sex** | | | | | | |
| Male | 35 | 34.7 | 82 | 31.9 | | |
| Female | 66 | 65.3 | 175 | 68.1 | 0.249 | 0.618 |
| **Marital status** | | | | | | |
| Single | 100 | 99.0 | 251 | 97.7 | 0.684 | FE p= |
| Married | 1 | 1.0 | 6 | 2.3 | | 0.678 |
| **Academic level** | | | | | | |
| First | 40 | 39.6 | 107 | 41.6 | | |
| Second | 29 | 28.7 | 65 | 25.3 | 0.923 | 0.820 |
| Third | 20 | 19.8 | 47 | 18.3 | | |
| Fourth | 12 | 11.9 | 38 | 14.8 | | |
| **Number of registered hours** | | | | | | |
| Less than 12 hours | 2 | 2.0 | 9 | 3.5 | | |
| 12–15 hours | 10 | 9.9 | 21 | 8.2 | 2.529 | 0.470 |
| 16–18 hours | 66 | 65.3 | 151 | 58.8 | | |
| 19–21 hours | 23 | 22.8 | 76 | 29.6 | | |
| **GPA last semester** | | | | | | |
| A | 0 | 0.0 | 4 | 1.6 | | |
| A- | 6 | 5.9 | 17 | 6.6 | | |
| B+ | 24 | 23.8 | 57 | 22.2 | | |
| B | 23 | 22.8 | 71 | 27.6 | | |
| B- | 12 | 11.9 | 33 | 12.8 | 7.187 | MC p= |
| C+ | 17 | 16.8 | 41 | 16.0 | | 0 .618 |
| C | 9 | 8.9 | 16 | 6.2 | | |
| C- | 6 | 5.9 | 15 | 5.8 | | |
| D+ | 4 | 4.0 | 2 | 0.8 | | |
| F | 0 | 0.0 | 1 | 0.4 | | |
| **Cumulative GPA** | | | | | | |
| Less than 2 | 2 | 2.0 | 6 | 2.3 | | |
| 2 – less than 3 | 54 | 53.5 | 123 | 47.9 | 0.915 | 0.633 |
| 3– 4 | 45 | 44.6 | 128 | 49.8 | | |

$\chi^2$: **Chi square test**        MC: **Monte Carlo** FE**: Fisher Exact**
*: Statistically significant at p ≤ 0.05

**Table (7):** Distribution of the studied nursing students according to scores of Self-Rating Scale of Self-Directed Learning (SRSSDL) (n = 358)

| Self-Rating Scale of Self Directed Learning (SRSSDL) | No. | % |
|---|---|---|
| Low level (60–140) | 5 | 1.4 |
| Moderate level (141–220) | 166 | 46.4 |
| High level (221–300) | 187 | 52.2 |
| **Total score (60–30)** Min. – Max. Mean ± SD. Median | 98.0 – 300.0 222.01 ± 36.02 221.0 | |
| **Mean score** Min. – Max. Mean ± SD. Median | 1.63 – 5.0 3.70 ± 0.60 3.68 | |
| **% Score** Min. – Max. Mean ± SD. Median | 15.83 – 100.0 67.50 ± 15.01 67.08 | |

**Table (8):** Descriptive analysis of the studied nursing students according to scores of Self-Rating Scale of Self-Directed Learning (SRSSDL) (n = 358)

| Self-Rating Scale of Self Directed Learning (SRSSDL) | Total score | Mean score | % Score |
|---|---|---|---|
| **Awareness (12–60)** Min. – Max. Mean ± SD. Median | 13.0 – 60.0 44.37 ± 8.29 44.0 | 1.08 – 5.0 3.70 ± 0.69 3.67 | 2.08 – 100.0 67.44 ± 17.26 66.67 |
| **Learning strategies (12–60)** Min. – Max. Mean ± SD. Median | 23.0 – 60.0 43.99 ± 7.45 44.0 | 1.92 – 5.0 3.67 ± 0.62 3.67 | 22.92 – 100.0 66.64 ± 15.52 66.67 |
| **Learning activities (12–60)** Min. – Max. Mean ± SD. Median | 16.0 – 60.0 43.08 ± 7.98 43.0 | 1.33 – 5.0 3.59 ± 0.66 3.58 | 8.33 – 100.0 64.75 ± 16.62 64.58 |
| **Evaluation (12–60)** Min. – Max. Mean ± SD. Median | 16.0 – 60.0 45.10 ± 8.68 45.0 | 1.33 – 5.0 3.76 ± 0.72 3.75 | 8.33 – 100.0 68.96 ± 18.07 68.75 |
| **Interpersonal skills (12–60)** Min. – Max. Mean ± SD. Median | 18.0 – 60.0 45.47 ± 8.42 46.0 | 1.50 – 5.0 3.79 ± 0.70 3.83 | 12.50 – 100.0 69.73 ± 17.55 70.83 |
| **Overall SRSSDL (60–300)** Min. – Max. Mean ± SD. Median | 98.0 – 300.0 222.01 ± 36.02 221.0 | 1.63 – 5.0 3.70 ± 0.60 3.68 | 15.83 – 100.0 67.50 ± 15.01 67.08 |

**Table (9):** Relation between self-rating scale of self-directed learning (SRSSDL) and demographic and academic data

| Demographic and academic data | Self-Rating Scale of Self-Directed Learning (SRSSDL) | | | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|---|---|
| | Low (n =5) | | Moderate (n =166) | | High (n =187) | | | |
| | No. | % | No. | % | No. | % | | |
| **Age (years)** | | | | | | | | |
| <20 | 1 | 20.0 | 61 | 36.7 | 71 | 38.0 | | |
| 20–22 | 4 | 80.0 | 91 | 54.8 | 96 | 51.3 | 1.614 | MCp= 0.806 |
| ≥23 | 0 | 0.0 | 14 | 8.4 | 20 | 10.7 | | |
| **Sex** | | | | | | | | |
| Male | 1 | 20.0 | 49 | 29.5 | 67 | 35.8 | 1.841 | MCp= 0.445 |
| Female | 4 | 80.0 | 117 | 70.5 | 120 | 64.2 | | |
| **Marital status** | | | | | | | | |
| Single | 5 | 100.0 | 163 | 98.2 | 183 | 97.9 | 0.840 | MCp= 1.000 |
| Married | 0 | 0.0 | 3 | 1.8 | 4 | 2.1 | | |
| **Academic level** | | | | | | | | |
| First | 1 | 20.0 | 56 | 33.7 | 90 | 48.1 | | |
| Second | 3 | 60.0 | 49 | 29.5 | 42 | 22.5 | 11.040 | MCp= 0.052 |
| Third | 1 | 20.0 | 37 | 22.3 | 29 | 15.5 | | |
| Fourth | 0 | 0.0 | 24 | 14.5 | 26 | 13.9 | | |
| **Number of registered hours** | | | | | | | | |
| Less than 12 hours | 0 | 0.0 | 2 | 1.2 | 9 | 4.8 | | |
| 12–15 hours | 1 | 20.0 | 15 | 9.0 | 15 | 8.0 | 5.947 | MCp= 0.398 |
| 16–18 hours | 3 | 60.0 | 100 | 60.2 | 114 | 61.0 | | |
| 19–21 hours | 1 | 20.0 | 49 | 29.5 | 49 | 26.2 | | |
| **GPA last semester** | | | | | | | | |
| A | 0 | 0.0 | 1 | .6 | 3 | 1.6 | | |
| A- | 0 | 0.0 | 5 | 3.0 | 18 | 9.6 | | |
| B+ | 1 | 20.0 | 35 | 21.1 | 45 | 24.1 | | |
| B | 0 | 0.0 | 42 | 25.3 | 52 | 27.8 | | |
| B- | 0 | 0.0 | 25 | 15.1 | 20 | 10.7 | 27.982* | MCp= 0.041* |
| C+ | 2 | 40.0 | 27 | 16.3 | 29 | 15.5 | | |
| C | 1 | 20.0 | 13 | 7.8 | 11 | 5.9 | | |
| C- | 0 | 0.0 | 13 | 7.8 | 8 | 4.3 | | |
| D+ | 1 | 20.0 | 4 | 2.4 | 1 | 0.5 | | |
| F | 0 | 0.0 | 1 | 0.6 | 0 | 0.0 | | |
| **Cumulative GPA** | | | | | | | | |
| Less than 2 | 0 | 0.0 | 4 | 2.4 | 4 | 2.1 | | |
| 2 – less than 3 | 4 | 80.0 | 91 | 54.8 | 82 | 43.9 | 6.784 | MCp= 0.149 |
| 3– 4 | 1 | 20.0 | 71 | 42.8 | 101 | 54.0 | | |

$\chi^2$: **Chi square test**          MC: **Monte Carlo**  FE**: Fisher Exact**
*: Statistically significant at $p \leq 0.05$

**Table (10):** Relation between Self-esteem and Internet addiction

| Internet addiction | Self-esteem | | | | $\chi^2$ | p |
|---|---|---|---|---|---|---|
| | Low (n = 101) | | High (n = 257) | | | |
| | No. | % | No. | % | | |
| Mild addiction | 31 | 30.7 | 153 | 59.5 | | |
| Moderate addiction | 61 | 60.4 | 94 | 36.6 | 24.678* | <0.001* |
| Severe addiction | 9 | 8.9 | 10 | 3.9 | | |

$\chi^2$: **Chi square test**
*: Statistically significant at $p \leq 0.05$

**Table (11):** Relation between self-rating scale of self-directed learning (SRSSDL) and internet addiction tool

| Internet addiction | Self-Rating Scale of Self-Directed Learning (SRSSDL) | | | | | | $\chi^2$ | $^{MC}p$ |
|---|---|---|---|---|---|---|---|---|
| | Low (n =5) | | Moderate (n =166) | | High (n =187) | | | |
| | No. | % | No. | % | No. | % | | |
| Mild addiction | 2 | 40.0 | 71 | 42.8 | 111 | 59.4 | | |
| Moderate addiction | 2 | 40.0 | 88 | 53.0 | 65 | 34.8 | 14.487* | 0.003* |
| Severe addiction | 1 | 20.0 | 7 | 4.2 | 11 | 5.9 | | |

$\chi^2$: **Chi square test**          MC: **Monte Carlo**
*: Statistically significant at $p \leq 0.05$

**Table (12):** Correlation between Internet addiction, self-directed learning, and Self-esteem among nursing students during (n = 358)

| | r | p |
|---|---|---|
| **Internet addiction Vs. Self-esteem** | -0.360* | <0.001* |
| **Internet addiction Vs. Self-Rating Scale of Self-Directed Learning (SRSSDL)** | -0.095 | 0.072 |
| **Self-esteem Vs. Self-Rating Scale of Self-Directed Learning (SRSSDL** | 0.471* | <0.001* |

**r: Pearson coefficient**
**\*: Statistically significant at p ≤ 0.05**

**Table (13):** Multivariate Linear regression for self-esteem and Self-Rating Scale of Self-Directed Learning (SRSSDL)

| | Self-esteem | | | | |
|---|---|---|---|---|---|
| | B | t | p | 95% CI | |
| | | | | LL | UL |
| **Internet addiction tool** | -0.374 | 7.288* | <0.001* | -0.475 | -0.273 |
| $R^2$ = **0.130**, F = **53.116***, p <0.001* | | | | | |
| | Self-Rating Scale of Self-Directed Learning | | | | |
| | B | t | p | 95% CI | |
| | | | | LL | UL |
| **Internet addiction tool** | -0.070 | 1.806 | 0.072 | -0.146 | 0.006 |
| $R^2$ =0.009, F =3.260, p =0.072 | | | | | |

F,p: f and p values for the model          $R^2$: Coefficient of determination
B: Unstandardized Coefficients          t: t-test of significance
CI: Confidence interval          LL: Lower limit          UL: Upper Limit
*: Statistically significant at $p \leq 0.05$

**Table (14):** Prediction of self-directed learning using self-esteem, internet addiction and demographic characteristics

| | B | SE | Beta | t | p | 95% CI | |
|---|---|---|---|---|---|---|---|
| | | | | | | Lower | Upper |
| **Model 1** | | | | | | | |
| Self esteem | 0.333 | 0.033 | 0.471 | 10.085[*] | <0.001[*] | 0.268 | 0.398 |
| $R^2$ =0.222 and adjusted $R^2$ =0.220 ,F=101.702[*],p<0.001[*] | | | | | | | |
| **Model 2** | | | | | | | |
| Self esteem | 0.324 | 0.033 | 0.458 | 9.908[*] | <0.001[*] | 0.259 | 0.388 |
| GPA last semester | -1.330 | 0.395 | -0.156 | 3.367[*] | <0.001[*] | 2.107 | 0.553 |
| $R^2$ =0.246 and adjusted $R^2$ =0.242 ,F=57.995[*],p<0.001[*] | | | | | | | |
| **Model 3** | | | | | | | |
| Self esteem | 0.324 | 0.032 | 0.458 | 9.979 | <0.001[*] | 0.260 | 0.388 |
| GPA last semester | -1.509 | 0.399 | -0.177 | 3.779 | <0.001[*] | -2.295 | -0.724 |
| Sex | -3.584 | 1.489 | -0.112 | 2.408[*] | 0.017[*] | -6.512 | -0.656 |
| $R^2$ =0.258 and adjusted $R^2$ =0.252 ,F=41.118[*],p<0.001[*] | | | | | | | |

F,p: f and p values for the model          $R^2$: Coefficient of determination
B: Unstandardized Coefficients          t: t-test of significance
CI: Confidence interval          LL: Lower limit          UL: Upper Limit
*: Statistically significant at p ≤ 0.05
Dependent Variable: self-directed learning

## Discussion

COVID-19 pandemic has remains and deeply affects all age groups physiologically, psychologically, and socially by generating a crisis effect in society. In most of the countries around the world, restrictions were obligatory to prevent the spread of COVID-19 with the closure of schools. So, adolescents' withdrawn from their social environment, school, physical activity, and hobbies (Lin, Faltýnkova, ´ Blinka, Sev ˇ ˇcíkov´a, & Husarova, 2020). As in many countries, all schools in Egypt were closed and distance education instituted. Pandemic control measures such as a long break from formal education and home isolation negatively affected the psychosocial status of students while internet use increased considerably. During the pandemic, adolescent students usually used the internet for different purposes such as foundation social communication, playing computer games, doing homework, and gaining information on different subjects, in addition to participating in distance education. The average daily time spent on the internet during the pandemic has increased compared to the pre-pandemic period, which has increased the risk of internet addiction in adolescent Students ( Faltýnkova et al., 2020; Lin, 2020). (Ozturk., 2021).

In this study, the researchers aimed to investigate the prevalence of Internet Addiction (IA) among nursing students and its association with their Self-Directed Learning (SDL) and Self-Esteem during COVID 19 Pandemic

The results of the current study revealed that more than half of nursing students had mild level of internet addiction and less than half of them had moderate level of it table (3), these results may be due to nursing workload which definitely affects the time that a nurse can allot to various tasks, consequently decrease the time spent in using internet. These results can be explain the findings in table (4) as the highest percentage of internet addiction level was found in the first academic year which may be related to decreasing the work load , less sense of responsibility, and changing in life style from one level of study to another challenging one, in this age group. Also, a statistically significant correlation was detected between the nursing student's academic data and internet addiction in relation to last semester GPA, as nursing students who had c+ had sever level of internet addiction (table 4). However, this result compatible with the study of Khalil (2016), who found that, especially in adolescents, IA increased the risk of suffering from a number of negative social and health concerns, such as poor academic performance, reduced personality relationship, anxiety, depression and other behavioral problems (Khalil, 2016; Sachitra ,2015).

Regarding the level of self-esteem among nursing students, it was observed that about three quarters of them had high self-esteem level table (5), this from the researcher's point of view may be from intrinsic motivation form their choices to this career and extrinsic from faculty member's motivation. However, this result was in-compatible with the study of AydÕn (2011) who found that self-esteem is discussed as a precursor to internet addiction. In-addition, self-esteem is an important determining factor of individuals' behaviors and activities. Some of these activities support development of an individual; on the other hand, some of them are destructive for personal development. Internet addiction is one of them and with a sense of diminishing self-control; it may cause a further lessening in self-esteem. The general inference we can make is that self-esteem has a significant role on adolescents' development. Thus, adolescents need to gain the belief that they are worthy. An emphatic understanding of their experiences and accepting them as they may be the first step taken by educators within the school environment. Moreover, the addiction to the internet also could translate to low self-esteem, depression, monotony, and attention deficit hyperactive disorder (Upadhayay, 2017)

Regarding the **relation between Self-esteem scale and demographic and academic data** the results (table 6) revealed that no statistically significant correlation was found. These findings in the line with the study of Rosenberg, (1965), who found that the modest correlations between self-esteem and school performance do not direct that high self-esteem leads to good performance. Instead, high self-esteem is partially the result of good school performance. Efforts to improve the self-esteem of learners have not been shown to improve academic performance and may occasionally be counterproductive. Experimental studies have generally failed to discover that self-esteem causes good task performance, with the important exclusion that high self-esteem enables perseverance after failure (Rosenberg, 1965).

Spotting the light on the Self-Rating Scale of Self-Directed Learning (SRSSDL) of nursing students, the study explored that self-directed learning levels varied among nursing

students (table7), it appears from the table that more than half of the nursing students had high level of self-directed learning, compared to less than half of them had moderate level of it.

Also table (8) was appeared that the nursing students had high mean score regarding all aspects of SRSSDL; Interpersonal skills followed by, evaluation, learning strategies, awareness, and learning activities, respectively. This result was congruent with the study of Tekko., (2018) who conducted a study titled "An Investigation of Self-Direct Learning Skills of Undergraduate Students." was found that when students' self-directed learning skills scores were analyzed with respect to field of study, the lowest score belonged to Natural Sciences students, were followed by Health Sciences and Social Sciences students. (Tekko., 2018).

Moreover, in relation to SRSSDL aspects, the interpersonal skills in SRSSDL have the highest mean percent score among nursing students in the present study. These results could be attributed the applying of nursing educational programs that empowers the students to establish a professional relationship with patients, family, and community. Also, the transferable intended outcomes in all courses of nursing education develop communication and social relation abilities. Moreover, all nursing students are obligated to study communication skills and sociology courses in the BSC educational program at first academic year. Also, nursing educators facilitate, guide and encourage the students to use group assignments, clinical conference and use some of teaching strategies such as problem-based learning, e-learning, and case studies that make them learn how to work in team, communication skills and how to cooperate to reach their learning objectives.

According to Bhana (2014) communication is the basic tool in nursing profession and the majority of nursing students have the abilities to work in team and communicate well, these abilities reflect characteristics of self-directed learning because of interactions with patients and their family. Also, assumed that interpersonal skills are an integral part of undergraduate nurse training and undergraduate nursing students have high

interpersonal skills because learning strategies that used in education such as case studies, role playing, simulation, problem-based learning and web-based learning that demanded them work in team. Santos et al (2019) found that undergraduate nursing students in Brazil have greater ability in interpersonal communication as a result of clinical practicing effective therapeutic communication and using of simulation as teaching method. In addition, Cho&Kweon (2017) postulated that undergraduate nursing students in South Korea have high communication competence because educators use team-based learning in teaching learning process that enhance communication skills and team building.

Academic achievement (GPA) is one of the essential factors that affect nursing students' self-directed learning. In the present study analysis of self-rating scale of self-directed learning showed that a significant difference existed between last-semester GPA and SRSSDL (table 9). However, this result compatible with the study of Tekko,(2018) who suggested that the investigation of the difference between academic success and self-directed learning revealed significant differences. As, students with higher academic success were found to have significantly higher self-directed learning (Tekko, 2018).

As respect to the relation between self-esteem and internet addiction (table 10). It was observed that the majority of nursing students who had high self-esteem level had mild level of addiction, in the other hand, the majority of them who had moderate level of addiction had low level of self-esteem. There was a statistically significant difference between nursing students' self-esteem and internet addiction. Since the beginning of the 2020 coronavirus COVID-19 pandemic, most of nations, has taken on one of the most important measures to reserve the safety of its countries – it has assigned distance education, distance education depends on students' self-directed learning (SDL) (Vaughan et al., 2013). Distance learning depends on technology. Over the last two years, findings pertaining to the impact of technology on students' academic achievement range from positive and negative to zero effects and relationships, which may be considered as an explanation why internet

addiction had opposite relation with self-esteem (Alghamdi, 2021)

Correspondingly, concerning the relation between SRSDL and internet addiction (table 11), the majority of nursing students who had high SRSDL level had mild level of addiction, in the other hand, the majority of them who had moderate level of addiction had low level of SRSDL. There was a statistically significant difference between nursing students SRSDL and internet addiction. This may be attributed to the fact that nursing students may find themselves overwhelmed with the amount of information not immediately interesting to them that they must learn very quickly. While nursing student appreciated being able to select their sources, time, space, methods and how they organized their schedule. On the other hand, they may feel that the disadvantages from time wasted in finding sources and mentors, overcoming language barriers and in following poor leads outweighed the advantages to self-directed learning. Yet, following the COVID-19 lockdown, with the continuing limitations of COVID-19, supported by their institution, nursing students now need to apply their abilities to learn to reduce these personally imposed barriers to self-directed learning.

Therefore, representing the correlation between internet addictions, self-directed learning, and self-esteem among nursing students (table 12), It was found that, there was a statistically significant difference between internet addiction and self-esteem negatively. While in relation to self-esteem and self-directed learning there was a statistically significant difference positively.

Finally, Self-esteem, and SRSDL critical key for better learning. A key issue in online learning is to improve learners' development with their educational activities. It is widely acknowledged those are linked to increased productivity and learning gain, while IA hindering only.

**Conclusion:**

It can be concluded from the present study that Internet Addiction (IA) among students was established to be associated with different psychiatric disorders such as low self-

esteem, and academic disorders such as low Self-Directed Learning (SDL).

## Recommendations:

- Educational workshops should be conducted to all nurse educators about importance of nursing students' time management planning. Also, training of nursing students how to manage deprivation from their social environment, school, physical activity, and hobbies.

- In order to increase self-directed learning, it is necessary to strengthen the capability of students in searching the internet. For that reason, conducting comprehensive training on "how to search the information through the internet" should be performed.

## References

A.Elmegeed SH (2012).Assessment of self-directed learning (SDL) readiness among graduate nursing students. unpublished master thesis, faculty of nursing Alexandria university.

Abd-Elaziz (2020) The effectiveness of a rational-emotive-behavioral counseling program to reduce nomophobia (fear of moving away from the mobile phone) and to develop self-esteem among a sample of university youth. Journal of Psychological Counseling, 62(62), 239-297.

Abdel-Salam I, Doaa M., (2019). Prevalence of Internet addiction and its associated factors among female students at Jouf University, Saudi Arabia. Journal of the Egyptian Public Health Association, 94(12), pp2-8.

Akin A, (2011). Self-compassion and internet addiction, Turkish Online Journal of Educational Technology·10(3), pp215-221.

Alghamdi A, Abdurrahman I, (2021).Covid-19 mandated self-directed distance learning: experiences of saudi female postgraduate students, Bin Faisal University, Saudi Arabia, 18(3).

Aydõn B, Sarõ S V, (2011). Internet addiction among adolescents: the role of self-esteem, Procedia Social and Behavioral Sciences www.sciencedirect.com 15pp 3500–3505.

Bhana V M ,(2014). Interpersonal skills development In generation Y student nurses: a literature review nurse Edu Today, 34(12):1430-4.

Brem, A., Viardot, E., & Nylund, P. A. (2021). Implications of the coronavirus (COVID-19) outbreak for innovation: Which technologies will improve our lives? Technological forecasting and social change, 163, 120451.

Chen H, Amir H.(2020). Comparing generalized and specific problematic smartphone/internet use: Longitudinal relationships between smartphone application based addiction and social media addiction and psychological distress, Journal of behavioral addictions 9(2), pp 410-19.

Cho Y, Kweon Y (2017). Effects of team-based learning on communication competence for undergraduate nursing students journal of Korea Academy of Psychiatric a metal health nursing , 26(1),pp 101-110.

Dangprasert, S. (2021). Effects on Using Tutoring Application in Integration with Self-Directed Learning to Improve Statistical Analysis Skills. TEM Journal, 10(1), 63-68.

Demirel,M,&Tekkol,I.(2018). An investigation of self -directed learning skill of undergraduate students. *Frontiers in psychology*, 9, 1-

Douglass ,C & Morris ,S. (2014). Student perspectives on self-directed learning. *Journal of the Scholarship of Teaching and Learning*, 14(1),13–25.

Guglielmino,L.(2013). The Case for Promoting Self-Directed Learning in Formal Educational Institutions. *SA-eDUC Journal*, 10 (2),1-3

Ibrahim S (2015). Internet addition and its relationship with psychological, and social adjustment among faculty nursing students, Alexandria university unpublished master thesis, faculty of nursing Alexandria university.

Jeon, J., & Park, S. (2021, December). Self-Directed Learning versus Problem-Based Learning in Korean Nurse Education: A Quasi-Experimental Study. In Healthcare , 9( 12), 1763. Multidisciplinary Digital Publishing Institute.

Karimi,R,Arendt,CS,&Cawley,P.(2010). Instructional design and assessment learning bridge: curriculum integration of didactic and experiential education. *American Journal of Pharmaceutical Education*,74(3),1-10.

Khalil A I , Alharbi B, Alhawasawi N Albander A,(2016). Prevalence of Internet Addiction among Nursing Students and the Association with their Academic Performance and Mental Health, Athens Journal of Health , 43 ,3(4) – pp 291-306, available at: https://doi.org/10.30958/ajh.3-4-2 doi=10.30958/ajh.3-4-2

Khiat H, (2015). Measuring Self-Directed Learning: A Diagnostic Tool for Adult Learners Journal of University Teaching & Learning Practice 12(2), pp 1-15

Lin C., Brostrom A., (2020). Investigating mediated effects of fear of COVID-19 and COVID-19 misunderstanding in the association between problematic social media use, psychological distress, a insomnia. Internet Interventions. Science Direct, 9(21), pp 100345.

Nazir H (2013). Arabic Validation of the Internet Addiction Test, Journal of Behavior and social networking 16(3) ,pp199-204

Onyema E et al (2020). Impact of Corona Virus Pandemic on education, Journal of education practice 11(13), pp 108-21

Ors,M.(2018).The Self-directed learning readiness level of the undergraduate students of midwife and nurse in terms of sustainability in nursing and midwifery Education. *Sustainability*,10,1-2.

Ozturk F., Alkaya S. A., (2021). Internet addiction and psychosocial problems among adolescents during the COVID-19 pandemic: A cross-sectional study. Archives of Psychiatric Nursing, 35 (9), pp 595–60, 0883-9417/© 2021 Elsevier Inc.

Poli R , (2017). Internet addiction update: diagnostic criteria, assessment and prevalence, Neuropsychiatry :London 7(1), 04–08

Rosenberg m.,(1965). Society and the adolescent self-image. Princeton, nj: Princeton university press. Rosenberg self-esteem scale

Rosenberg, M., Schooler, C., Schoenbach, C., & Rosenberg, F. (1995). Global self-esteem and specific self-esteem: Different concepts, different outcomes. American sociological review, 141-156.

Sachitra V., (2015). Relationship between internet addictions and academic performance among university undergraduates. Retrieved from: http://goo.gl/3ayNFI

Santos et al, (2019), Interpersonal communication competence among nursing students, Latin American Journal of Nursing ;27:e3207

Shirinkam M, (2016), Internet addiction antecedents: Self-control as a predictor International Journal of Medical Research & Health Sciences, 5(5): pp143-151.

Sulasiwi,I, Handayanto,S, & Wartono.(2019). Development of self rating scale instrument of self directed learning skills for high school students. *Journal of Penelitian dan Evaluasi Pendidikan*, 23(1) , 1-11.

Tekko k , Demirel M, (2018) An investigation of self-directed learning skills of undergraduate students, Front. Psychol. pp 9:2324

Upadhayay N., Guragain S. , (2019) . Level of internet addiction among adolescents -a review. Advances in medical education and practice,(8) https:/ /www. researchgate .net/ publication/ 339298653

Vaughan et al, (2013). Teaching In blended learning environments Creating a sustaining community of inquiry, Norman D. Vaughan, Martha Cleveland-Innes, and D. Randy Garrison. Canadian, pp 97-9.

Williamson, S. N. (2007). Development of a self-rating scale of self-directed learning. Nurse researcher, 14(2).

Young, K. S., & Rogers, R. C., (1998). The relationship between depression and internet addiction. CyberPsychology & Behavior, 1, 25–28.