Motivation and self-regulation of learning in health sciences undergraduate students

Motivación y autorregulación del aprendizaje en estudiantes de grado de Ciencias de la Salud

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Abstract:

Learning motivation can be influenced by an individual's capacity for self-regulation of learning. Therefore, this study aimed to analyze the motivations and self-regulation of learning among students in Physiotherapy, Nursing, and Podiatry at the Faculty of Health Sciences, University of León. We conducted a cross-sectional descriptive study with a representative sample of students from the Nursing, Physiotherapy, and Podiatry programs at the University of León. In the analysis differentiated by degree, only the Control domain in the Self-regulation of Learning showed significant differences (p = 0.03), with Nursing participants obtaining higher scores. Regarding Motivational Strategies for Learning, Extrinsic Goals (p < 0.001) and Test Anxiety (p = 0.02) also differed among the subgroups. In the teaching-learning process of Health Sciences Degrees, it is crucial for educators to consider that, among the three degrees analyzed, Nursing students exhibited the highest concern for these types of goals and the greatest anxiety before exams. Similarly, teaching professionals involved in Physiotherapy education should be aware of the lower scores obtained by students in this degree regarding their ability to concentrate, maintain focus, and prioritize learning tasks.

Keywords: Control, Anxiety, Physiotherapy, Podiatry, Nursing.

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Resumen:

La motivación para el aprendizaje puede estar influida por la capacidad de autorregulación del aprendizaje del individuo. Por ello, este estudio tuvo como objetivo analizar las motivaciones y la autorregulación del aprendizaje entre los estudiantes de Fisioterapia, Enfermería y Podología de la Facultad de Ciencias de la Salud de la Universidad de León. Se realizó un estudio descriptivo transversal con una muestra representativa de estudiantes de Enfermería, Fisioterapia y Podología de la Universidad de León. En el análisis diferenciado por titulaciones, sólo el dominio Control en la Autorregulación del Aprendizaje mostró diferencias significativas (p = 0,03), obteniendo los participantes de Enfermería puntuaciones más altas. En cuanto a las Estrategias Motivacionales para el Aprendizaje, las Metas Extrínsecas (p < 0,001) y la Ansiedad ante los Exámenes (p = 0,02) también difirieron entre los subgrupos. En el proceso de enseñanza-aprendizaje de los Grados de Ciencias de la Salud, es crucial para los educadores considerar que, entre las tres titulaciones analizadas, los estudiantes de Enfermería mostraron la mayor preocupación por este tipo de metas y la mayor ansiedad ante los exámenes. Del mismo modo, los profesionales docentes implicados en la enseñanza de la Fisioterapia deben ser conscientes de las puntuaciones más bajas obtenidas por los estudiantes de esta titulación en cuanto a su capacidad para concentrarse, mantener la atención y priorizar las tareas de aprendizaje.

Palabras clave: Control, Ansiedad, Fisioterapia, Podología, Enfermería.

INTRODUCTION

The teaching and learning process in Health Sciences faculties, including medicine, dentistry, and related departments, is diverse. An essential part of this process involves acquiring clinical and technical skills in classrooms, clinics, and laboratories (Abbasi et al., 2020).

These learning processes, in turn, intersect with each student's motivations. The self-determination theory, one of the theories of human motivation, has been widely utilized in educational settings (Mukhalalati and Taylor, 2019). According to the self-determination theory, humans strive to satisfy three basic psychological needs: autonomy (experiencing behavior as volitional and independent), competence (experiencing effectiveness in action), and relatedness (having a sense of connection with other significant individuals), which are complementary (Schunk and DiBenedetto, 2020). The satisfaction or frustration of these psychological needs determines the quality of motivation and engagement in a specific activity (Kalajas-Tilga, Koka, Hein, Tilga, and Raudsepp, 2020).

Motivation can be influenced by each individual's capacity for self-regulation of learning. In order for students to develop effective self-regulation strategies and receive appropriate support in this development, researchers and educators require precise and reliable measures

for this construct. This way, researchers and educators can attain an accurate account of students' self-regulation and identify areas for improvement (Matcha, Gašević, and Pardo, 2019).

In 2008, Zimmerman published an article on innovative ways to measure Self-Regulated Learning (SRL) (Zimmerman, 2008). Several outstanding issues related to SRL measurement were highlighted in this work. One of these issues was the extent to which it is possible to compare tracking data (computerized logs of students' online behaviors) with traditional forms of measuring SRL using self-report questionnaire data.

The convergence between self-report statements and concurrent behavior tends to be low; however, since this publication, many new approaches have emerged that justify further detailed research (Rovers, Clarebout, Savelberg, de Bruin, and van Merriënboer, 2019).

At the same time, these processes coexist in the academic reality of each student who, after each semester, undergoes evaluation (Ryan and Deci, 2020). In this line, recent research on university grades suggests that they could have negative effects on students' well-being and learning (Simons, Leverett, and Beaumont, 2020). Specifically, grades can increase stress and anxiety, promote cheating during assessments, and reduce cooperative learning, critical thinking, autonomous academic motivation, and feelings of confidence between teachers and students (Tannock, 2015). Students' motivation to learn can be classified into two types based on the degree of intrinsic and extrinsic motivation (Chamberlin, Yasué, and Chiang, 2023).

As a result of this reality, the present research was defined with the objective of analyzing the motivations and self-regulation of learning among students in Health Sciences from different university programs. All of this with the previous hypothesis that both constructs are related.

METHOD

Participants

For this study, a cross-sectional descriptive study was conducted on a representative sample of first, second, third, and fourth-year students in Nursing, Physiotherapy, and Podiatry programs at the Ponferrada Campus of the University of León. The total enrollment for these courses in the academic year 2022-2023 was 588 students. Based on these data, considering a sample heterogeneity of 50%, a margin of error of 5%, and a confidence level of 99%, a sample size of 234 individuals would be required. For this study, a sample of 247 participants was achieved, reaching a response and participation rate of 42%.

Instruments

The instrument used was an Ad Hoc Questionnaire to collect information about the level of empathy and the representation channels of learning styles among Health Sciences students at the Ponferrada Campus of the University of León. The questionnaire was developed taking into account other works on the subject (Araya et al., 2017; Rodríguez-Nogueira, Leirós-Rodríguez, Quiroga-Sánchez, Álvarez-Álvarez, and Álvarez-Barrio, 2021) and was validated through expert judgment (Lynn, 1986).

The questionnaire consisted of a total of 44 items:

(a) Sociodemographic data (4 items): sex, age, degree (Nursing, Physiotherapy, or Podiatry), and course (first, second, third, or fourth).

(b) Motivated Strategies for Learning Questionnaire – Short Form (19 items): originally designed by Pintrich et al. (1988), as referenced by Trench (2000), and several studies have reported reliability indices of 0.75 (Martínez and Galán, 2000). It is a self-administered instrument used in research to assess students' motivation and beliefs, among other aspects. It includes 19 items related to the domains of Valuation, Affective, and Expectations. The first includes three subscales on Task Valuation, Intrinsic Goals, and Extrinsic Goals. The latter two include a subscale on Test Anxiety and Self-Efficacy, respectively (Inzunza et al., 2018).

(c) Learning Self-Regulation Questionnaire (14 items): This questionnaire was created by Williams & Deci (1996) and consists of 14 items with response alternatives on a Likert scale ranging from 1 to 7, from "*Not at all true for me*" to "*Totally true for me*". The original version has two dimensions: the Autonomy dimension (comprising six items) and the Control dimension (comprising eight items). It also has construct validity, convergent validity, and reliability for each of its dimensions, with Cronbach's alpha scores of 0.78 for Autonomy and 0.70 for Control. Matos (2009) reported construct validity for the Autonomy ($\alpha = 0.78$) and Control ($\alpha = 0.90$) dimensions in its Spanish-translated version.

Procedure

The completion of the questionnaires took place in person during the months of May and July 2023. All participants were informed that the study adhered to the principles of the Declaration of Helsinki (2013 revision) and the Data Protection Law 15/1999. Additionally, all participants were required to sign an informed consent form to participate in this research. The research protocol received approval from the Ethics Committee of the University of León (code: ÉTICA-ULE-022-2023).

To characterize the sample, descriptive measures (frequencies, percentages, mean, and standard deviation) were employed. T-tests were used to determine differences between sexes, and ANOVA was used to analyze questions from the questionnaire with continuous

response options, according to participants' academic year and degree. All statistical analyses were conducted using Stata version 12 (StataCorp., USA), and statistical significance was always set at a p-value < 0.05.

RESULTS

The sample consisted of 247 participants, of whom 168 (68%) were women (Table 1). No statistically significant differences were identified between both sexes in the age variable (p = 0.5) or in their distribution across different courses (p = 0.809). However, their distribution was statistically different among the various degrees (χ^2 = 10.1555; p = 0.006).

Table 1. Descriptive statistics of the sample

	All (n = 247)	Men (n = 79)	Women (n = 168)
Age (mean ± standard deviation)	21.7 ± 4.5	20.9 ± 2.2	22.1 ± 5.2
Academic course [n (percentage)]:			
First year	70 (28.3%)	22 (27.9%)	48 (28.6%)
Second year	57 (23.1%)	18 (22.8%)	39 (23.2%)
Third year	63 (25.5%)	18 (22.8%)	45 (26.8%)
Fourth year	57 (23.1%)	21 (26.5%)	36 (21.4%)
Degree [n (percentage)]: *			
Nursing	41 (16.6%)	6 (7.6%)	35 (20.8%)
Physiotherapy	139 (56.3%)	55 (69.6%)	84 (50%)
Podiatry	67 (27.1%)	18 (22.8%)	49 (29.2%)

*p < 0.01

In the Learning Self-Regulation Test, scores did not differ statistically between both sexes (neither for the total score nor in any of its two subscales) (Table 2). However, in the Motivated Strategies for Learning Test, differences were found in the Test components of Test Anxiety (p = 0.01) and Self-Efficacy (p = 0.02). In contrast, none of the three subscales of the Valuation component revealed differences between sexes (p > 0.05 in all three tests).

Table 2. Results of the Learning Self-Regulation Test and Motivated Strategies for Learning by sexes

	Men (n = 79)	Women (n = 168)
Motivational and Learning Strategies Test		
Valuation:		
Task valuation	5 ± 1	5.1 ± 1.1
Intrinsic goals	5 ± 1	4.7 ± 1.1
Extrinsic goals	3.8 ± 1.5	3.9 ± 1.5
Affective:		
Test anxiety**	4.1 ± 1.2	4.6 ± 1.3
Expectations:		
Self-efficacy*	4.7 ± 1	4.3 ± 1.2
Learning Self-Regulation Test		
Autonomy	29.7 ± 6.6	30.1 ± 6.4
Control	25.4 ± 7.9	24.9 ± 7.4
Total	55.1 ± 10.9	55 ± 9.9

*$p < 0.05$; **$p < 0.01$

In the analysis differentiated by degree, in Learning Self-Regulation, only the Control domain showed significant differences ($p = 0.03$), with the score obtained by Nursing participants being higher, followed by Podiatry and Physiotherapy participants, in last place. Regarding Motivated Strategies for Learning, Extrinsic Goals ($p < 0.001$) and Test Anxiety ($p = 0.02$) were also different among the defined subgroups. Specifically, Extrinsic Goals were statistically higher among Nursing students compared to Podiatry students. Test Anxiety was also statistically higher among Nursing participants than among Podiatry participants (Table 3).

Table 3. Results of the Learning Self-Regulation Test and Motivated Strategies for Learning by degree

	Nursing (n = 41)	Physiotherapy (n = 139)	Podiatry (n = 67)
Motivational and Learning Strategies Test			
Valuation:			
Task valuation	4.9 ± 1.2	5.1 ± 1	5.1 ± 1.1
Intrinsic goals	4.6 ± 1.1	4.9 ± 1	4.8 ± 1.2
Extrinsic goals*	4.4 ± 1.5	3.5 ± 1.4	4.2 ± 1.5
Affective:			
Test anxiety*	4.9 ± 1.3	4.4 ± 1.3	4.2 ± 1.3
Expectations:			
Self-efficacy	4.3 ± 1.3	4.4 ± 1.1	4.6 ± 1.2
Learning Self-Regulation Test			
Autonomy	29.7 ± 6.5	30.1 ± 6	29.8 ± 7.3
Control*	27 ± 6.3	24 ± 7.4	26.2 ± 8.2
Total	56.7 ± 9.1	54.1 ± 9.6	56 ± 11.8

*$p < 0.001$

The analysis differentiated by academic year also showed significant differences among the defined subgroups (Table 4). Specifically, these differences were identified in the Extrinsic Goals subscale ($p = 0.04$) between first and third-year students. Additionally, the highest scores in the Learning Self-Regulation Questionnaire were achieved by fourth-year students in the Autonomy component and for the total score. However, for the Control component, the highest score was achieved by first-year students. Regarding the lowest scores, these were identified in second-year students in both questionnaire components and their total score.

Table 4. Results of the Learning Self-Regulation Test and Motivated Strategies for Learning by academic course

	First year (n = 70)	Second year (n = 57)	Third year (n = 63)	Fourth year (n = 57)
Motivational and Learning Strategies Test				
Valuation:				
Task valuation	5 ± 1	5 ± 1	5 ± 1.2	5.3 ± 1
Intrinsic goals	4.8 ± 1	4.7 ± 1	4.7 ± 1.1	5.1 ± 1
Extrinsic goals*	4.3 ±	3.7 ± 1.3	3.6 ± 1.4	3.8 ± 1.6
Affective:				
Test anxiety	4.6 ± 1.4	4.5 ± 1.2	4.4 ± 1.3	4.2 ± 1.3
Expectations:				
Self-efficacy	4.4 ± 1.8	4.3 ± 1.1	4.3 ± 1.2	4.7 ± 1.1
Learning Self-Regulation Test				
Autonomy	29.3 ± 5.7	28.8 ± 6.4	30 ± 7.1	31.9 ± 6.3
Control	26.5 ± 8.1	23.9 ± 6.7	25 ± 6.9	24.8 ± 8.3
Total	55.7 ± 10.2	52.7 ± 8.9	55 ± 11	56.7 ± 10.4

*$p < 0.05$

DISCUSSION

The objective of this study was to analyze the motivations and self-regulation of learning among students in Health Sciences from different university programs. After analyzing the results, the following findings were identified:

Learning self-regulation was similar between both sexes but differed among different degrees. The higher Control domain among Nursing students compared to Physiotherapy students, in particular, seems to indicate that Nursing students are more capable of regulating and directing their behavior and cognitive resources toward specific learning goals. This implies the ability to maintain focus, avoid distractions, set priorities, and stay focused on learning tasks (Carter, Rice, Yang, and Jackson, 2020). In other words, it appears that the analyzed Nursing students showed the greatest capacity to effectively manage their time and efforts to achieve their academic goals (García and Pintrich, 2023). Conversely, Physiotherapy students demonstrated lower performance in this task.In relation to Motivated Strategies for Learning,

both Extrinsic Goals and Test Anxiety were statistically higher among Nursing students compared to Podiatry students. This seems to indicate that, on the one hand, Podiatry participants have a more genuine interest in the study content than their Nursing counterparts (Lu, Yang, Shi, and Wang, 2021). This is consistent with the lower score also obtained in Test Anxiety, which would represent how negatively this emotion affects a student's performance and concentration (Özcan and Eren, 2019).

Similarly, the score achieved in the Extrinsic Goals component decreased as participants progressed in their academic training. This may be indicative of the maturity attained by students over the years, and as they advance through academic courses, they become aware of the importance of their own learning beyond the obtained result or other external objectives (Huhtiniemi, Sääkslahti, Watt, and Jaakkola, 2019).

This study has methodological limitations that need to be acknowledged: the collection of information through this questionnaire with closed and limited response options may bias participants' perceptions. Additionally, the inability to use other instruments to triangulate the results and thus verify the validity of the opinions expressed through different questions. However, this research has strengths such as the novelty of the study object, the representativeness of the achieved sample size, and the inclusion and comparison of contributions from students in all four different courses of three distinct Health Sciences degrees.

In the teaching-learning process of Health Sciences Degrees, the involved faculty should consider that in the first academic year, students show high motivation for extrinsic goals, which appears to decrease until the third year but rises again as they approach the end of the degree.

Similarly, among the three analyzed degrees, Nursing students showed greater concern for these types of goals, as well as higher test anxiety. This should be taken into account by education professionals involved in teaching this discipline.

Likewise, teaching professionals related to Physiotherapy should consider the low score obtained by students in this degree regarding their ability to concentrate, maintain focus, and prioritize learning tasks.

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