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Motivation to learn in middle school and association with individual and contextual aspects

Motivação para aprender no ensino fundamental e a associação com aspectos individuais e contextuais

ABSTRACT

Purpose: To verify the association between motivation to learn, quality of life, health self-perception, and environmental, school and behavioral resources of students in a private middle school. **Methods:** This is an observational, analytical, cross-sectional study conducted with 124 adolescents using the following instruments: Participant Characterization, Learning Motivation Scale (LMS), Self-perceived Health Questionnaire, Strengths and Difficulties Questionnaire (SDQ) and Pediatric Quality of Life Inventory™ (PedsQL) (Self-report) - conducted with the students, and Brazilian Criteria of Economic Classification Questionnaire, PedsQL (Parent Proxy-report) and Home Environment Resources Scale (HERS) - responded by the parents and/or legal guardians. School performance was assessed by the average scores of students in the period investigated. Descriptive, bivariate, and multivariate analyses were performed to assess the association between response and explanatory variables. **Results:** The study sample was composed mostly of socioeconomic class A female students who evaluated their health as good or excellent. The Learning Goal domain of the LMS presented higher average results compared with those of the other domains. Most students performed well or very well in the PedsQL and presented positive self-ratings in the three dimensions (physical, emotional and social functioning) of this instrument. Motivation to learn was associated with the quality of life, learning strengths, and self-perceived health of adolescents. **Conclusion:** Considering the peculiarity of adolescence and the complexity of the learning process and its consequences, parents and educators play a fundamental role in learning motivation.

RESUMO

Objetivo: verificar a associação entre motivação para aprender, qualidade de vida, autopercepção de saúde e recursos ambientais, escolares e comportamentais de estudantes do ensino fundamental de uma escola de financiamento privado. **Método:** estudo observacional, analítico e transversal realizado com 124 estudantes, que responderam aos instrumentos Caracterização dos Participantes, Escala de Motivação para a Aprendizagem, Autopercepção de Saúde, Questionário de Capacidades e Dificuldades e Questionário Pediátrico sobre Qualidade de Vida. O Critério de Classificação Econômica Brasil, a versão do Questionário Pediátrico sobre Qualidade de Vida para pais e o Inventário de Recursos do Ambiente Familiar foram respondidos pelos pais ou responsáveis. O desempenho escolar foi obtido pela média do aproveitamento nas disciplinas no período pesquisado. Foram realizadas análises descritiva, bivariada e multivariada para a avaliação da associação entre as variáveis resposta e explicativas. **Resultados:** a maioria dos participantes era do sexo feminino, pertencia à classe econômica A e avaliou sua saúde como boa ou excelente. O domínio Meta-aprender da Escala de Motivação para a Aprendizagem apresentou a maior média quando comparado aos outros domínios. A maioria dos estudantes apresentou desempenho bom ou muito bom e grande parte avaliou positivamente as três dimensões da qualidade de vida. A motivação para aprender mostrou-se associada à qualidade de vida, às capacidades dos adolescentes e à autopercepção de saúde. **Conclusão:** considerando a peculiaridade da adolescência e a complexidade do processo de aprendizagem e suas consequências, ressalta-se a importância dos pais e educadores no estímulo por aprender.

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INTRODUCTION

Motivation to learn has aroused the interest of many researchers in the areas of health and education because it influences school and academic performance, being related to personal and contextual factors[1]. The understanding of what moves individuals to perform tasks, either by their own will or by necessity and considering internal and external stimuli, resulted in theoretical models of different assumptions, with Self-determination Theory and Achievement Goal Theory as the most commonly used in motivation research in the school context.

The Self-Determination Theory is based on conditions of the social context that interfere positively or negatively in self-motivation, with autonomy, competence and belonging as the basic psychological needs to promote the natural processes of motivation, resulting in more motivated and mentally healthy individuals. From this perspective, individuals are motivated by either intrinsic or extrinsic orientations. Intrinsic motivation is characterized by a natural tendency and spontaneous interest in knowledge, its assimilation and mastery, while extrinsic motivation is related to activity in response to something, both for obtaining material rewards and achieving social recognition[2,3].

The Achievement Goal Theory, which was used as a basis of this study, is a socio-cognitive approach that seeks to understand motivation and explain it through the reason why people commit their efforts to carrying out their activities, what objectives they intend to achieve, and how they behave emotionally and cognitively, also considering factors related to the stimuli offered by the school environment. The learning and performance (approach and avoidance) goals are the achievement goals admitted by this theoretical model, where students more oriented to the learning goal seek primarily individual improvement and use strategies of knowledge acquisition more often and better. For individuals who aim at performance in carrying out a task and are oriented according to the performance-approach and performance-avoidance goals, the results obtained are guided by external stimuli, being associated only with environmental demands. Students inclined towards these goals choose activities in which they may be considered better in order to gain prominence in comparison with the group, and behave negatively before failure [4,5].

It is worth noting that, as human motivation is a multifaceted construct, there is the perspective of multiple goals, which commonly occurs when students are not guided exclusively by one type of goal, and vary according to the situations and activities experienced. In this direction, studies point out, for example, that the learning goal may indicate the student's interest, while the performance-approach goal may be related to performance itself. These studies have also revealed that, although these are not identical constructs, as they follow different assumptions, students intrinsically motivated and those aligned with the learning goal are similar in terms of involvement and willingness to perform a task - a fact that suggests that teaching practices that promote the learning goal somehow awaken students to the development of intrinsic motivation[6,7,8].

In view of the importance and impact of motivation to learn and the strong indications of its relationship with cognitive and social aspects that intervene not only in the school context, but also in the development of fundamental life skills, it is relevant to measure the motivation of adolescents in carrying out activities aimed at learning, as well as how the interest in learning is related to the individual's intrinsic and extrinsic conditions. In this context, this study sought to verify the association between motivation to learn, quality of life, self-perceived health, and environmental, school and behavioral resources of students in a private middle school.

METHODS

This study was approved by the Research Ethics Committee (REC) of the Universidade Federal de Minas Gerais (UFMG) under protocol no. 2.422.795. The parents and/or legal guardians and the students signed Informed Consent (ICF) and Assent (IAF) Forms, respectively, prior to study commencement.

This is an observational, analytical, cross-sectional study conducted with a sample stratified by sex/gender, age, and school year composed of 124 students enrolled in a private middle school in the city of Belo Horizonte, state of Minas Gerais, Brazil. Inclusion criteria comprised students aged 11-14 years enrolled in the educational network and institution surveyed, whereas the exclusion criterion was failure to fully complete the research instruments.

The sample size of this study presented statistical power of 80% in estimating low motivation to learn, considering 22.5% as a parameter in the population[9]. A precision of 10% was obtained based on this sample size and statistical power, at a significance level of 5%. The Minitab 17 software was used to estimate the proportion.

The following research instruments were used: Participant Characterization, Brazilian Criteria of Economic Classification (BCEC)[10], Pediatric Quality of Life Inventory™ (PedsQL) 4.0[11], Self-perceived Health Questionnaire, Learning Motivation Scale (LMS)[12], Home Environment Resource Scale (HERS)[13] and the Portuguese version of the Strengths and Difficulties Questionnaire (SDQ-Por)[14].

The Participant Characterization questionnaire, consisting of data such as sex/gender, age and school year, was completed by the students, whereas the BCEC, which groups participants in classes ranging from A (greater purchasing power) to E (lower purchasing power) according to the possession of material goods and level of education of the head of the family (Social Economic Status - SES), was responded by the respective parents and/or legal guardians.

The PedsQL™ 4.0 assesses quality of life (QoL) in four domains: physical (physical dimension), emotional, social and school (psychosocial dimension) functioning. It was used with authorization by the authors and completed by the students (Self-report) and their parents and/or legal guardians (Proxy-report).

The students responded to the following questions of the Self-perceived Health Questionnaire: "How do you evaluate/consider your health today?" and "How would you rate your health?". For answers to the first question, a Likert scale with the following options was used: very bad, bad, regular, good, and excellent. For the second question, a numerical scale from zero to 10 was used, with zero considered as very bad and 10 as excellent.

Student motivation to learn was measured using the LMS, which aims to assess motivation to study and perform school tasks. The participants answered 28 questions distributed in three domains: 12 items in the Learning Goal domain, in which students are the ones who seek challenges and use them as a resource for their own learning and intellectual development; nine items in the Performance-approach Goal domain, which shows the students' concern with only surpass others, demonstrating their own intelligence; seven items on the Performance-avoidance Goal domain, in which students avoid situations in which failure can occur, seeming less able to perform the proposed tasks. Thus, all questions were related to motivation, attitude, and goals in relation to learning. As a response to the statements, the participants could mark: I agree, I do not know, or I disagree. As proposed by the authors of this scale, three, two and one points were assigned for each "I agree", "I don't know" and "I disagree" answers, respectively. The Learning Goal, Performance-approach Goal, and Performance-avoidance Goal domains have maximum scores of 36, 27 and 21, respectively.

In order to assess the resources in the family environment that can influence the learning of individuals, the HERS, which is composed of 10 open questions followed by multiple choice items, was applied to the parents and/or legal guardians. The gross score was given by the sum of the marked items, except for topics 8, 9 and 10, which have specific scores.

The SDQ-Por was proposed to detect problems associated with child and youth mental health through behavioral aspects. The questionnaire consists of 25 items distributed in five scales of five items each, namely, emotional symptoms, conduct problems, hyperactivity, peer problems, and prosocial. The SDQ-Por can be answered by parents, teachers, and children aged >11 years. In this investigation, the participants responded to the questions and their answers were analyzed according to the recommendations proposed in the literature: the scores of the first four scales are summed to generate the total difficulties score, and the prosocial scale score, which indicates strengths, is calculated.

Data collection was carried out between June and August 2018 using Google Forms applied to the students' school timetable and environment. Information on school performance was obtained by the average scores of students in the school period investigated.

For this study, participant characterization (sex/gender, age, school year, and SES), QoL (Self- and Parent Proxy-reports), self-perceived health, home environment resources, behavioral aspects (strengths and difficulties) and school performance were the explanatory variables, whereas motivation to learn using the three domains of the LMS: Learning Goal, Performance-Approach Goal and Performance-Avoidance Goal was the response variable.

Descriptive, bivariate and multivariate analyses were performed. Descriptive analysis considered the distribution of absolute and relative frequencies of the categorical variables and of the numerical synthesis of the continuous variables. Inferential, bivariate and multivariate analyses were used to assess the association between response and explanatory variables.

For the association analyses, the LMS domains were divided into two categories, low and high motivation, according to the median. The Pearson's chi-squared test and the Chi-squared test for trend were applied to the ordinal and nominal variables. The total difficulties score of the SDQ-Por, as well as the score of its prosocial scale (strengths), were also used as a continuous variable. The Mann-Whitney test was used to assess the association between the LMS domains and the SDQ-Por variables

Variables with a statistically significant association at the level of 20% in the bivariate analysis (p-value in bold in the tables) were considered in the multiple logistic regression models, and a multivariate analysis model was built for each LMS domain. As the age and school year variables were highly correlated, only the age variable was used in the multivariate logistic regression models.

The Backward Elimination method was run manually to select the variables in the models and, in each step of the analysis, the variable with the highest p-value was eliminated from the model. The variables with statistical association at the 5% significance level and the age variable, which remained as an adjustment variable, were maintained in the final model. The magnitude of the associations was assessed by the odds ratio (OR) and their respective 95% confidence intervals (CI). The adequacy of the model was assessed through the Hosmer-Lemeshow test. All data analyses were processed using the IBM SPSS 21.0 software.

RESULTS

Most of the study participants were female (54.0%). Regarding age, although all age groups were present in very similar proportions (22.6-27.4%), 11-year-old students corresponded to the largest proportion (27.4%). The largest group of students was in 6th grade (32.3%), and the majority belonged to class A SES (66.9%) (Figure 1).

Most adolescents considered their health to be excellent (55.6%) or good (35.5%), adding up to 91.1%. Only 8.9% considered their health as regular (8.1%) or bad (0.8%). The scores assigned to health were also high, with 74.2% of the participants giving a score >8 and 25.8% of them giving a score ≤8 to their health.
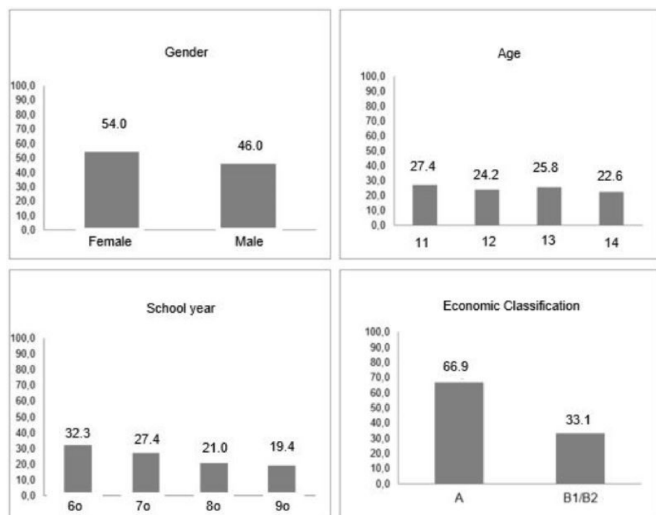
Figure 1. Distribution of the students' sociodemographic variables (N = 124)

In the LMS, the Learning Goal domain had a mean of 29.3 (SD=4.7) and a median of 31.0, the Performance-approach Goal domain showed a mean of 15.3 (SD=4.4) and a median of 15.0, and the Performance-avoidance Goal domain presented a mean of 9.4 (SD=3.1) and a median of 8.0 (Table 1).

Regarding the HERS, the total score showed a mean of 10.1 (SD=5.69) and a median of 9.0. As described in the Methods section, the students were divided into two categories, high and low motivation, according to the median.

As for QoL, measured through the PedsQLTM (Self-report scale), 48% of the students presented positive self-ratings in the physical and psychosocial dimensions and total score of this instrument. In the parent proxy-report scale of this inventory, 44, 47 and 49% of the adolescents presented positive evaluation in the physical, emotional and social functioning dimensions, respectively, as well as in the total score.

School performance presented mean and median of 80.30 (SD=8.37) and 80.62, respectively. Most of the students showed excellent (12%) or very good (40%) performance, while a smaller proportion had good (33%) or fair (15%) performance.

For the strengths and difficulties variable, measured by the prosocial scale and numerical synthesis of the total SDQ-Por score, mean of 10.1 (SD=5.7) and median of 9.0 were observed. The prosocial scale of this questionnaire showed mean of 8.31 (SD=1.54) and median of 8.0. The scores were categorized as recommended in the literature[14], and percentages of altered results on difficulties and strengths were 12.1 and 0.8%, respectively.

In the bivariate analyses, the Learning Goal domain showed a linear and inverse association with age of the participants (p=0.021), with a higher percentage of younger students (11 and 12 years) in the category of the highest score in this domain (≥ 31 points), and with school year, with a higher percentage

of adolescents in the initial year (6th grade) in the category of the highest score in this domain (≥ 31 points). In this category, a linear and inverse gradient was observed, that is, as school advanced, a decrease in the proportion of students in the category of highest motivation was observed. There was an association of this domain with school performance (p=0.034) and QoL (adolescents) (p=0.001), indicating a higher proportion of students with better performance and high QoL among the most motivated, in addition to the total SDQ-Por score (p=0.029), with a higher proportion of the "normal" score among those who had greater motivation in the Learning Goal domain. Regarding the Performance-approach Goal domain, no significant associations (p>0.05) were found with the variables evaluated. In the Performance-avoidance domain, significant and inverse associations were found with school performance (p=0.006) and self-perceived health (p=0.004) (Table 2).

Both SDQ-Por scores (continuous) were associated with the Learning Goal domain, with p-values equal to 0.006 and 0.004 for the total difficulties and prosocial scale (strengths) scores, respectively. No statistical associations at the 5% significance level were observed between the Performance-approach Goal and Performance-avoidance Goal domains and the SDQ-Por (Table 3).

The following variables were included in the multivariate logistic regression analysis in the initial model of the Learning Goal domain: age (adjustment variable), school performance, self-perceived health, PedsQL (Self-report), HERS, and SDQ-For prosocial scale and total scores. In the final model, the variables QoL (Self-report) (p=0.022) and SDQ-For prosocial scale (p=0.012) remained associated with high motivation to learn. Adjusted by age, the final model indicated that students who rated their QoL as high were 2.5 times more likely to present high motivation to learn compared with those with low self-ratings (OR=2.50; CI=1.14 -5.43). An increase of one point in the prosocial scale of this domain (1 to 10), increased the chance of the student having high motivation to learn by 45% (OR=1.45; CI=1.09-1.94). Both models, initial and final, evaluated by the Hosmer-Lemeshow test, showed good fit (p=0.638 / p=0.539) (Table 4).

The following variables were included in the initial logistic regression model for the Performance-avoidance Goal domain: school performance, self-perceived health, PedsQL (Self-report), SDQ-Por total score, and age (adjustment variable). In the final model, the only variable that remained associated with high performance-avoidance was self-perceived health. In the final model, adjusted for age, students who rated their health as good/excellent had a 92% lower chance of having high scores in this domain (greater avoidance to learning) compared with those who rated their health as poor/regular (OR=0.08; CI=0.01-0.65). Both models, initial and final, evaluated by the Hosmer-Lemeshow test, showed good fit (p=0.615 / p=0.983) (Table 5).

Table 1. Descriptive analysis of the distribution of scores in the Learning Motivation Scale (LMS) domains (N=124)

Domains	Mean	SD	Median	Minimum	Maximum	p-value*
Learning goal	29.3	4.7	31.0	16.0	36.0	<0.001
Performance-approach goal	15.3	4.4	15.0	9.0	27.0	<0.001
Performance-avoidance goal	9.4	3.1	8.0	7.0	21.0	<0.001

*Kolmogorov-Smirnov test

Table 2. Bivariate analysis between the Learning Motivation Scale (LMS) domains and the variables sociodemographic (BCEC), school performance, self-perceived health, quality of life (PedsQLTM Inventory), Home Environment Resource Scale (HERS), and Strengths and Difficulties Questionnaire (SDQ-Por) (N = 124)

Characteristics	Learning goal		Performance-approach goal		Performance-avoidance goal							
	Low (N=61)	High (N=63)	Low (N=59)	High (N=65)	Low (N=63)				High (N=61)			
	N	%	N	%	N	%	N	%	N	%	N	%
Sex/Gender												
Female	33	54.1	34	54.0	33	55.9	34	52.3	34	54.0	33	54.1
Male	28	45.9	29	46.0	26	44.1	31	47.7	29	46.0	28	45.9
p-value *	0.988		0.686						0.988			
Age												
11	10	16.3	24	38.1	15	25.4	19	29.2	17	27.0	17	27.9
12	17	27.9	13	20.6	18	30.6	12	18.5	15	23.8	15	24.6
13	17	27.9	15	23.8	11	18.6	21	32.3	16	25.4	16	26.2
14	17	27.9	11	17.5	15	25.4	13	20.0	15	23.8	13	21.3
p-value*	0.021**		0.961						0.802			
CCEB												
A1	40	65.6	43	68.3	38	64.4	45	69.2	40	63.5	43	70.5
B1/B2	21	34.4	20	31.7	21	35.6	20	30.8	23	36.5	18	29.5
p-value*	0.751		0.569						0.407			
School year												
6th grade	14	23.0	26	41.3	18	30.5	22	33.8	19	30.2	21	34.4
7th grade	18	29.5	16	25.4	17	28.8	17	26.2	17	27.0	17	27.9
8th grade	13	21.3	13	20.6	10	16.9	16	24.6	15	23.8	11	18.0
9th grade	16	26.2	8	12.7	14	23.7	10	15.4	12	19.0	12	19.7
p-value*	0.021**		0.539						0.877			
School performance												
Fair	11	18.0	7	11.1	9	15.3	9	13.8	6	9.5	12	9.7
Good	24	39.3	17	27.0	22	37.3	19	29.2	16	25.4	25	41.0
Very good	21	34.4	29	46.0	20	33.9	30	46.2	31	49.2	19	31.1
Excellent	5	8.2	10	15.4	8	13.6	7	10.8	10	15.9	5	8.2
p-value*	0.034**		0.613						0.006**			

Table 2. Continuation...

Characteristics	Learning Goal		Performance-Approach Goal		Performance-Avoidance Goal							
	Low (N=61)	High (N=63)	Low (N=59)	High (N=65)	Low (N=63)				High (N=61)			
	N	%	N	%	N	%	N	%	N	%	N	%
Self-perceived health												
Bad/regular	8	13.1	3	4.8	6	10.2	5	7.7	1	1.6	10	16.4
Good/Excellent	53	86.9	60	95.2	53	89.8	60	92.3	62	98.4	51	83.6
p-value *	0.102		0.628						0.004*			
General QoL - adolescents												
Low	41	67.2	24	38.1	29	49.2	36	55.4	29	46.0	36	59.0
High	20	32.8	39	61.9	30	50.8	29	44.6	34	54.0	25	41
p-value *	0.001		0.488						0.148			
General QoL - parents												
Low	31	50.8	32	50.8	29	49.2	34	52.3	33	52.4	30	49.2
High	30	49.2	31	49.2	30	50.8	31	47.7	30	47.6	31	50.8
p-value *	0.998		0.726						0.722			
HERS												
Low	35	57.4	27	42.9	27	45.8	35	53.8	33	52.4	29	47.5
High	26	42.6	36	57.1	32	54.2	30	46.2	30	47.6	32	52.5
p-value*	0.106		0.369						0.59			
SDQ-Por - total score												
Normal	43	70.5	54	85.7	51	86.4	46	70.8	52	82.5	45	73.8
Borderline	7	11.5	5	7.9	3	5.1	9	13.8	6	9.5	6	9.8
Abnormal	11	18.0	4	6.3	5	8.5	10	15.4	5	7.9	10	16.4
p-value*	0.029**		0.067						0.162			

*Pearson's chi-squared test   **Linear association

LMS domains: Learning goal: Low (<31); High (>31); Performance-approach goal: Low (<15); High (≥5); Performance-avoidance goal: Low (≤8); High (>8).

Captions: BCEC = Brazilian Criteria of Economic Classification ; QoL = quality of life; HERS = Home Environment Resource Scale; SDQ-Por = Strengths and Difficulties Questionnaire, Portuguese version.

Table 3. Bivariate analysis between the Learning Motivation Scale (LMS) domains and the Strengths and Difficulties Questionnaire (SDQ-Por) total and prosocial scale scores (N = 124)

Characteristics	Learning goal		Performance-approach goal		Performance-avoidance goal	
	Low (N=61)	High (N=63)	Low (N=59)	High (N=65)	Low (N=63)	High (N=61)
SDQ-Por - prosocial scale						
Median	8.0	9.0	9.0	8.0	9.0	8.0
Mean	7.9	8.7	8.25	8.35	8.44	8.16
SD	1.73	1.21	1.71	1.37	1.48	1.58
p-value*	0.006		0.959		0.269	
SDQ-Por - total						
Median	11.0	8.0	9.0	10.0	9.0	10.0
Mean	11.49	8.76	9.44	10.71	9.17	11.07
SD	5.66	5.44	4.69	6.44	5.25	6.01
p-value*	0.004		0.398		0.077	

*Mann-Whitney test.
Captions: SDQ-Por = Portuguese version of the Strengths and Difficulties Questionnaire.

Table 4. Multiple logistic regression analysis results for the Learning Motivation Scale (LMS) Learning Goal domain (N = 124)

Characteristics*	Initial model		Final model	
	OR (95% CI)	p-value*	OR (95% CI)	p-value*
School performance				
Fair	1.02 (0.18-5.53)	0.984	–	–
Good	0.55 (0.14-2.18)	0.391	–	–
Very good	1.02 (0.26-7.97)	0.973	–	–
Self-perceived health	1.35 (0.31-5.99)	0.690	–	–
Quality of Life (adolescents)	1.91 (0.78-4.72)	0.159	2.50 (1.14-5.43)	0.022
HERS	1.19 (0.50-2.83)	0.689	–	–
SDQ-Por (prosocial scale)	1.44 (1.07-1.95)	0.020	1.45 (1.09-1.94)	0.012
SDQ-Por (total)	0.96 (0.89-1.05)	0.304	–	–
Age	0.61 (0.47-1.04)	0.079	0.68 (0.48-0.97)	0.033

Reference categories: excellent school performance; poor/regular self-perceived health; low quality of life; low family environment resources.
*Wald test. Adjustment of the initial/final models (Hosmer-Lemeshow test): p=0.638/p=0.539
Captions: HERS = Home Environment Resources Scale; SDQ-Por = Strengths and Difficulties Questionnaire, Portuguese version.

Table 5. Multiple logistic regression analysis results for the Learning Motivation Scale (LMS) Performance-avoidance Goal domain (N = 124)

Characteristics*	Initial model		Final model	
	OR (95% CI)	p-value*	OR (95% CI)	p-value*
School performance				
Fair	3.13 (0.64-15.32)	0.108	–	–
Good	2.83 (0.79-10.17)	0.111	–	–
Very good	1.17 (0.32-3.86)	0.863	–	–
Self-perceived health	0.11 (0.13-0.95)	0.045	0.08 (0.01-0.65)	0.018
Quality of Life (adolescents)	0.79 (0.33-1.88)	0.594	–	–
SDQ-Por (total)	1.02 (0.94-1.10)	0.672	–	–
Age	0.82 (0.58-1.17)	0.283	0.92 (0.67-1.27)	0.616

Reference categories: excellent school performance; poor/regular self-perceived health; low quality of life.
*Wald test. Adjustment of the initial/final models (Hosmer-Lemeshow test): p=0.615/p=0.983
Captions: SDQ-Por = Portuguese version of the Strengths and Difficulties Questionnaire.

DISCUSSION

Cognitive, emotional and behavioral aspects can interfere with the motivation to learn of children and adolescents, so that the environment, teacher motivation, and individual and group experiences permeate the knowledge acquisition processes[15,16]. Results of the present study showed that motivation to learn was associated with the PedsQL™ total and prosocial scale scores (Learning Goal domain) and inversely associated with self-perceived health (Performance-avoidance Goal domain). Participants were middle school students of a private institution located in the city of Belo Horizonte, state of Minas Gerais, Brazil. The study sample was representative in terms of sex/gender, age, and school year for the scenario investigated, and most of them presented good or very good school performance and belonged to class A SES.

Descriptive analysis of the results showed that the Learning Motivation Scale (LMS) Learning Goal domain, aligned with the concept of an intrinsic motivation of better quality and duration, was the domain that presented the highest average results compared with those of the other domains, followed by the Performance-approach Goal domain and the Performance-avoidance Goal domain, whose learning motivations are based mainly on the need to demonstrate possession of acquired knowledge to others. The LMS construction and validation study, carried out with high school students from public and private schools in the state of São Paulo, indicated significant and positive association of the Learning Goal domain with the Performance-approach Goal domain and negative association with the Performance-avoidance Goal domain. In contrast, the Performance-approach Goal domain showed associations with the other two domains, which reinforces a possibility or the individual need for students to simultaneously employ more than one goal according to school experiences[15,16].

According to the bivariate analysis, the LMS Learning Goal domain was linearly and inversely associated with the variables age and school year of students, which can be explained by loss of interest, inadequacy of teaching strategies, and increased number of activities that arise as students advance in the basic education segments. There was association of the Learning Goal domain with school performance and QoL was, indicating a higher proportion of students with high QoL among the most motivated, as well as a relationship between physical, emotional and social well-being and good performance in school activities. A Colombian study conducted with university students in 2016 did not find a relationship between QoL, sociodemographic factors, and school performance; however, it evidenced an inversely proportional association of school performance with age and social strata: the lower the SES and the younger the student, the better the school performance. The fact that these students understand education as an opportunity to overcome their poor living conditions in general can be a possible explanation to this finding[17]. The relationship between health-related QoL and school performance was also evidenced in a survey conducted with children aged 9-12 years who were students in public schools in the city of Córdoba, Argentina. Those with better performance in school activities also presented better scores in the psychosocial domains of QoL, strengthening the hypothesis of an association between social and psychological conditions and school achievement[18].

The present study also revealed a relationship between the LMS Learning Goal domain and the total SDQ-Por score, in which the highest proportion of results considered adequate occurred among students who demonstrated greater motivation in this domain. The behavioral assessment proposed by the instrument and answered by the students themselves, signaled a good perception of the participants with typical development on the nature of their motivation to learn. The home environment resources, known to be positively associated with self-assessment, academic performance, and educational achievement in children[19], presented association with the Learning Goal domain, corroborating the relevance of the home environment and the constructive conduct of parents in the face of the complete development of their children.

In the multiple logistic regression models, the Learning Goal in the final model indicated that students who rated their QoL as high were 2.5 times more likely to be highly motivated to learn compared with those with low self-rated QoL. A survey conducted with regular 7th grade students aged 12-13 years showed association between school performance and well-being, in which underperforming students showed worse satisfaction with life[20]. As QoL is a broad construct that contemplates physical, emotional and social aspects, the students' perception of their own internal reality and their predisposition to perform and remain active seem closely related. Likewise, the SDQ-Por prosocial scale, which identifies positive and useful actions in relation to others, was associated with the Learning Goal domain. An increase of one point in this scale (1 to 10), increased the chance of students showing high motivation to learn by 45%, corroborating the idea that interested individuals are not indifferent to those around them and to their own improvement[21].

Students who present initiative and are willing to think and do, show a greater tendency to overcome their own conditions.

Positive and significant inverse associations were found between the Performance-avoidance Goal domain and the variables school performance and self-perceived health, reinforcing the evidence from a study carried out with university students in Australia, which showed that intrinsic motivation and self-confidence for learning can improve the students' success in their academic trajectory and their psychosocial well-being[22]. Student who avoid situations that may favor knowledge acquisition tend to show a lack of confidence in themselves, low self-esteem, and psychological conditions that impair their ability to achieve individually and contribute to the group.

In the Performance-avoidance Goal domain considered in the multiple logistic regression analysis final model, the variable that remained associated with greater learning avoidance was self-perceived health. Students who rated their health as good/excellent were 92% less likely to avoid learning compared with those with poor/regular health self-ratings. Thus, high self-perception of health had a protective effect, since the Performance-avoidance Goal domain is related to less motivation to learn. A prospective cohort study conducted in Finland with 8061 16-year-old students showed a positive association between health, physical activity, self-rating, self-confidence, and school performance by improving cognitive and executive functions[23].

This study demonstrated the association between motivation to learn and QoL, self-perceived health, strengths and difficulties,

and school performance of adolescent students in a private school. In order to broaden the conclusions of the present study, in view of its sample profile with most participants from families belonging to the class A SES, a comparison with students from different sociodemographic conditions seems appropriate. Considering the study design, it is not possible to establish a causal relationship between the LMS domains and the explanatory variables. The elements resulting from this analysis aim at a reflection on educational practices and the study of actions to promote the health of this population, in view of the importance of the school environment for the construction of concepts and individual awareness[24].

CONCLUSION

Motivation to learn was associated with the variables QoL and strengths of students when analyzing the LMS Learning Goal domain and was inversely associated with the self-perceived health variable in the Performance-avoidance Goal domain. The variables home environment resources, school performance, and difficulties of students did not remain associated with the LMS domains in the multiple logistic regression. The variable sociodemographic profile was not associated with motivation to learn in this sample.

The physical and psychological health conditions of students and aspects inherent in the environment they are inserted interfere in the learning process and can favor or hinder school performance and knowledge acquisition. In this context, and considering that adolescence is a phase of transition and challenges, it is worth emphasizing the importance of the effective role played by parents and teachers in observing, monitoring, and encouraging self-knowledge, self-care, and the development of skills and strengths that arouse a real interest in learning.

REFERENCES

1. Martinelli SC. Um estudo sobre desempenho escolar e motivação de crianças. Educ Rev. 2014(53):201-16. http://dx.doi.org/10.1590/0104-4060.27122.

2. Martinelli SC, Genari CHM. Relações entre desempenho escolar e orientações motivacionais. Estud Psicol 2009;14(1):13-21. http://dx.doi.org/10.1590/S1413-294X2009000100003.

3. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. Am Psychol. 2000;55(1):68-78. PMid: 11392867. DOI: 10.1037//0003-066x.55.1.68.

4. Bueno JMH, Zenorini RDPC, dos Santos AAA, Matumoto AY, Buchatsky J. Investigação das propriedades psicométricas de uma escala de metas de realização. Estud Psicol. 2007;24(1):79-87. http://dx.doi.org/10.1590/S0103-166X2007000100009

5. Bzuneck JA, Boruchovitch E. Motivação e autorregulação da motivação no contexto educativo. Psicol. Ensino & Form. 2016;7(2):73-84.

6. Harackiewicz JM, Barron KE, Pintrich PR, Elliot AJ, Thrash TM. Revision of achievement goal theory: Necessary and illuminating. J Educ Psychol. 2002 94(3):638-45.

7. Zenorini RPC, dos Santos AAA, Monteiro RM. Motivação para aprender: relação com o desempenho de estudantes. Paidéia. 2011;21(49):157-64. http://dx.doi.org/10.1590/S0103-863X2011000200003.

8. Cardoso LR, Bzuneck JA. Motivação no ensino superior: metas de realização e estratégias de aprendizagem. Psicol Esc Educ. 2004;8(2):145-55. http://dx.doi.org/10.1590/S1413-85572004000200003.

9. Paiva MLMF, Boruchovitch E. Orientações motivacionais, crenças educacionais e desempenho escolar de estudantes do ensino fundamental. Psicol estud. 2010;15(2):381-9. http://dx.doi.org/10.1590/S1413-73722010000200017.

10. ABEP: Associação Brasileira de Empresa de Pesquisa [Internet]. São Paulo: Associação Brasileira de Empresa de Pesquisa; 2018. Critério de Classificação Econômica Brasil (CCEB). [cited 2019 Sep 7]. Available from: http://www.abep.org/criterio-brasil.

11. Varni JW, Seid M, Kurtin PS. PedsQL 4.0: Reliability and validity of the Pediatric Quality of Life Inventory Version 4.0 generic core scales in healthy and patient populations. Med Care. 2001;39(8):800-12. PMid: 11468499. DOI: 10.1097/00005650-200108000-00006.

12. Zenorini RDPC, dos Santos AAA. Escala de metas de realização como medida da motivação para aprendizagem. R Interam Psicol, 2010;44(2):291-8.

13. Marturano EM. O inventário de recursos do ambiente familiar. Psicol Reflex Crit. 2006;19(3):498-506. http://dx.doi.org/10.1590/S0102-79722006000300019.

14. Goodman R. The Strengths and Difficulties Questionnaire: a research note. J Child Psychol Psychiatry. 1997;38(5):581-6. PMid: 9255702. DOI: 10.1111/j.1469-7610.1997.tb01545.x

15. Moreira AEC, de Oliveira KL, Scacchetti FAP. O processo de ensino e aprendizagem em questão: implicações metodológicas e motivacionais. Educ Unisinos. 2016;20(1):106-16. https://doi.org/10.4013/edu.2016.201.11.

16. Nicolielo-Carrilho, Ana Paola, and S. R. V. Hage. Metacognitive reading strategies of children with learning disabilities. Codas. 2017;29(3). PMid: 28538827. DOI: 10.1590/2317-1782/20172016091.

17. Brito-Jiménez IT, Palacio-Sañudo J. Calidad de vida, desempeño académico y variables Sociodemográficas en estudiantes universitarios de Santa Marta-Colombia. Duazary. 2016;13(2):133-41. https://doi.org/10.21676/2389783X.1719.

18. Degoy E, Berra S. Differences in health-related quality of life by academic performance in children of the city of Cordoba-Argentina. Qual Life Res. 2018;27(6):1463-71. PMid: 29616428. DOI: 10.1007/s11136-018-1849-9.

19. Preston KS, Gottfried AW, Oliver PH, Gottfried AE, Delany DE, Ibrahim SM. Positive family relationships: Longitudinal network of relations. J Fam Psychol. 2016;30(7):875-85. DOI: 10.1037/fam0000243.

20. Rathmann K, Herke M, Bilz L, Rimpelä A, Hurrelmann K, Richter M. Class-level school performance and life satisfaction: Differential sensitivity for low-and high-performing school-aged children. Int J Environ Res Public Health. 2018;15(12):e2750. PMid: 30563121. PMCID: PMC6313449. DOI: 10.3390/ijerph15122750.

21. Pecotche CBG. Deficiências e propensões do ser humano. 13 ed. Trad. Filiados da Fundação Logosófica. São Paulo: Editora Logosófica; 2012.

22. Edgar S, Carr SE, Connaughton J, Celenza A. Student motivation to learn: is self-belief the key to transition and first year performance in an undergraduate health professions program? BMC Med Educ. 2019;19(111):1-9. DOI: 10.1186/s12909-019-1539-5.

23. Kantomaa MT, Stamatakis E, Kankaanpää A, Kajantie E, Taanila A, Tammelin T. Associations of physical activity and sedentary behavior with adolescent academic achievement. J Res Adolesc. 2016;26(3):432-42. PMid: 27610027. PMCID: PMC4995724. DOI: 10.1111/jora.12203.

24. Silva, Eduarda Dandolini da, Júlio Alexandre de Matheucci Teixeira, and Renata Coelho Scharlach. Use of digital audio players by high school students: measurement of use intensity and usage habits. CoDAS. 2018;30(5). http://dx.doi.org/10.1590/2317-1782/20182017124.

Author contributions

GNAF and SMAL participated in the study design, analysis and interpretation of data, and writing and critical review of the manuscript.