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Intrinsic motivation of Medical students in the remote tutorial group during the Sars-CoV2 pandemic

Motivação intrínseca do estudante de Medicina no grupo tutorial remoto durante a pandemia pelo Sars-CoV2

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ABSTRACT

Introduction: As it is an active methodology that proposes the development of student autonomy, motivation becomes crucial for the effectiveness of learning processes. In 2020, given the context of the new coronavirus pandemic, there was a need to adapt to the remote learning environment. In this new scenario, the intrinsic motivation of students was put on the agenda.

Objective: to evaluate the intrinsic motivation of medical students in remote tutorials in Problem-Based Learning during the SARS-CoV2 pandemic

Method: This was a cross-sectional study carried out at Faculdade Pernambucana de Saúde involving medical students randomly selected between July 2021 and August 2022. The translated, cross-culturally adapted and validated Intrinsic Motivation Inventory (IMI) was used. The IMI analysis was carried out by calculating the arithmetic mean of the 45 items, composing the overall mean score (OMS) and each subscale/domain was defined using the arithmetic mean of the set of items that constitute it, defining the mean score by subscale (MSS). The following cutoff points were defined: ≤3.0 (not true/not motivated), >3.0 and <6.0 (somewhat true/motivated) and ≥6.0 (very true/very motivated). The project was approved by the Research Ethics Committee of Faculdade Pernambucana de Saúde, CAAE number: 50408021.7.0000.5569 and Opinion Number: 4.934.317.

Results: 115 medical students were involved in the study. Regarding motivation assessed by the Intrinsic Motivation Inventory: three students were unmotivated (OMS ≤3.0), corresponding to 2.6%, 111 students were motivated (OMS >3.0 and <6.0), corresponding to 96.5% of them and one student was very motivated (OMS ≥6.0), corresponding to 0.86%. The majority of students stated they had their own place to study, without noise and were able to be alone there (69.6%, 62.6% and 88.7%, respectively). Most reported having good quality internet (78.3%), the computer was the most used equipment (93.0%) and reported to be in good working order by 92.0% of students.

Conclusions: the students were motivated to take part in the tutorial groups despite the context of the SARS-CoV2 pandemic. Favorable socioeconomic factors in relation to the structure of the student's residence, such as internet and computer access, may have contributed to motivation.

Keywords: Problem-Based Learning; Motivation; Autonomy; Self-directed learning; COVID-19; Online learning.

RESUMO

Introdução: *Em se tratando de uma metodologia ativa que propõe desenvolvimento da autonomia do estudante, a motivação se torna crucial para a efetividade dos processos de aprendizagem. Em 2020, diante do contexto de pandemia pelo novo coronavírus, houve a necessidade de adaptação para o ambiente remoto de aprendizagem. Nesse novo cenário, colocou-se em pauta a motivação intrínseca dos estudantes.*

Objetivo: *Este estudo teve como objetivo avaliar a motivação intrínseca do estudante de Medicina em tutorias remotas na Aprendizagem Baseada em Problemas durante a pandemia pelo Sars-CoV2.*

Método: *Trata-se de um estudo transversal realizado na Faculdade Pernambucana de Saúde envolvendo estudantes de Medicina selecionados randomicamente entre julho de 2021 e agosto de 2022. Utilizou-se o Inventário de Motivação Intrínseca (IMI), traduzido, adaptado transculturalmente e validado. A análise do IMI foi feita por meio do cálculo da média aritmética dos 45 itens, compondo o escore médio geral (EMG), e definiu-se cada subescala/domínio por meio da média aritmética do conjunto de itens que a compõe, determinando o escore médio por subescala (EMS). Foram definidos os seguintes pontos de corte: ≤ 3,0 (não verdadeiro/não motivado), > 3,0 e < 6,0 (algo verdadeiro/motivado) e > 6,0 (muito verdadeiro/muito motivado). O projeto foi aprovado pelo Comitê de Ética em Pesquisa da Faculdade Pernambucana de Saúde: CAAE 50408021.7.0000.5569 e Parecer nº 4.934.317.*

Resultado: *Foram envolvidos 115 estudantes de Medicina. Em relação à motivação avaliada pelo IMI: três estudantes estavam desmotivados (EMG <= 3,0), correspondendo a 2,6%, 111 estudantes estavam motivados (EMG > 3,0 e < 6,0), correspondendo a 96,5% deles, e um estudante se mostrou muito motivado (EMG >= 6,0), correspondendo a 0,86%. Os estudantes, em sua maioria, afirmaram que tinham local próprio para estudo, sem ruídos e que conseguiam ficar sozinhos nesse ambiente (respectivamente 69,6%, 62,6% e 88,7%). A maior parte relatou ter internet de boa qualidade (78,3%), o computador foi o equipamento mais utilizado (93,0%) e com bom funcionamento referido por 92,0% dos estudantes.*

Conclusão: *Os estudantes se mostraram motivados para os grupos tutoriais a despeito do contexto da pandemia pelo Sars-CoV2. Fatores socioeconômicos favoráveis em relação à estrutura da residência do estudante, como acesso à internet e computador, podem ter contribuído para a motivação.*

Palavras-chaves: *Aprendizagem Baseada em Problemas; Motivação; Autonomia; Aprendizagem Autodirigida; Covid-19.*

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INTRODUCTION

Problem-Based Learning (PBL) is a learning methodology that proposes the use of problems as a starting point for the construction, acquisition and integration of new knowledge[1]. It is based on four fundamental educational principles that translate into the four types of learning: constructivist, collaborative, self-directed and contextual[2]. In constructivist learning, the student is active throughout the entire process, and based on their previous knowledge, new knowledge is constructed, increasing the memory and cognition networks on top of the studied concepts. At the time of the group discussion, each student contributes with new information and the knowledge increasingly expands[3].

In collaborative learning, the work is carried out in small groups, in which there is mutual interdependence for the construction of knowledge. This work occurs in a positive way, through the creation and sharing of ideas, making learning more effective[3].

In self-directed learning, the student is an active author in their study script, identifying obstacles and monitoring each stage of their learning process[3]. And finally, contextualized learning, which aims to give meaning and sense to the contents worked through the study of real-life situations, which students will probably face in their future professional life, making the content more tangible and thus facilitating its assimilation[3,4].

In PBL, students are presented with a problem, which does not necessarily have to be solved, but rather must contain the triggers to stimulate a good discussion and contribute to the identification of knowledge gaps and, thus, to the definition of learning objectives[5].

The discussion takes place in study groups called Tutorial Groups (TG). Typical TG have an average of 10 students and a tutor who will mediate and facilitate the learning process. These groups will have the number of meetings within a variable time frame, depending on the institution they are in; however, the ideal is that it should be for enough time to develop good harmony in the group[6].

Based on what has been said about PBL, it is observed that it allows students to develop critical thinking skills, the possibility of greater retention and construction of knowledge[1]. Additionally, it allows collaborative learning, in which participants have a common goal, share responsibilities and are mutually dependent, thus, the group motivates its members to exert maximum effort, as individual success depends on the collective one. Thus, the role of motivation is reinforced in a methodology that proposes the development of student autonomy, being crucial for the effectiveness of learning processes[2]. Therefore, it is important to comment on some aspects of motivation from the perspective of the Self-Determination Theory (SDT).

The SDT points out that motivation is catalyzed depending on the situation in which the individual is, so a behavior, to be considered self-determined, needs to be accompanied by four basic premises: to be autonomous, self-regulated, to be an expression of psychological empowerment and to result in self-realization. Motivation can be classified as extrinsic (EM) and intrinsic (IM) motivation, with EM being an easier path to be taken by educators, in which the student is motivated by pressure, punishment or the pursuit of rewards. On the other hand, IM is an essential tool for educators, as it is a type of motivation that results in pleasurable and better quality learning[7,8].

For the effectiveness of intrinsic motivation, there is a need for interaction between three basic psychological needs, which are the perception of the development of competence, relationship and autonomy. Competence, from this perspective, refers to the objective of being effective in interactions with the environment and acquiring the expected knowledges, skills and attitudes; relationship comes from the sense of community, from the desire for collaborative interactions with the aim of establishing bonds and promoting shared learning. Autonomy, ultimately, refers to the acquisition of independence and the power of free choice according to one's way of seeing things[9].

To assess IM, several questionnaires were developed based on SDT, among them, the Intrinsic Motivation Inventory (IMI), which in addition to being indicated by the European Medical Education Association, is the one that best portrays the participants' subjective experience in performing a given task[10,11,12]. A study conducted in 2017 translated, cross-culturally adapted, and validated the IMI to assess intrinsic motivation in the Brazilian Portuguese language[13].

Studies indicate that students using the PBL methodology feel more motivated and satisfied with their study, in addition to recognizing the acquisition of new skills, such as the ability to communicate better and work in teams[6,14,15].

However, in 2020, in the face of the pandemic context due to the emergence of the new coronavirus, social distancing became necessary, and Provisional Measure 934, of April 1, 2020, declared that teaching would be carried out remotely, causing tutorial groups to be held in a virtual environment[16]. In this new scenario, the students' intrinsic motivation was put on the agenda, highlighting obstacles such as limitations in internet access, limitations in camera and microphone resources, lack of an adequate environment to carry out the tutorials, and tutors/teachers with little experience or specific training in education in the remote environment, factors that could favor the reduction of interaction in tutorial groups[17].

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Therefore, the present study aimed to evaluate, through IMI, the intrinsic motivation of medical students with the experience of a remote tutorial group in the context of the SARS-CoV2 pandemic. Therefore, it is expected to contribute to improving the effectiveness of the learning processes in this new scenario.

METHODS

A cross-sectional study was carried out, involving medical students from all semesters of Faculdade Pernambucana de Saúde - FPS, which since its foundation in 2005 has used PBL as a learning methodology and since the beginning of the COVID-19 pandemic in March 2020, has carried out remote tutorials, using the Cisco Webex® platform. The study was developed between July 2021 and August 2022.

The parameters used to define the sample size were: total number of medical students in the first four years of the course, considering the first and second entries, which was 776, the size of the effect of interest of 9.3% of demotivation found in a previous study carried out involving FPS medical students in face-to-face tutorials[13] and the confidence level of 95.0%. The number found was 109. The statistical software of public domain Open Epi® was used. The students were randomly selected using a table of random numbers, through the same program. Medical students enrolled in the first four years of the course and those over 18 years of age were included in the study.

For data collection, a specific questionnaire was prepared for the study, covering the variables of sociodemographic, academic data, access to technology and infrastructure for participation in remote tutoring and variables related to the pandemic status among the students, so that it was possible to achieve the proposed objectives.

The IMI was used to evaluate SDT-based intrinsic motivation. This instrument has been translated and cross-culturally adapted into Brazilian Portuguese[13]. This inventory is subdivided into seven subscales, which assess: 1. interest/pleasure, 2. perceived competence, 3. effort/importance, 4. pressure/tension, 5. perception of choice, 6. value/utility, 7. integration (relationship) during the performance of a certain activity. In total, the inventory consists of 45 items, which are grouped to make up each of the seven abovementioned subscales. It is a Likert-type scale for each item with seven answer options, ranging from "Not true", "Somewhat true" to "Very true". In the inventory, there are reverse scores in 17 questions according to the following subscales: interest/pleasure (questions 3 and 4), perceived competence (question 1), effort/importance (question 2), pressure/tension (question 3), perception of choice (question 5) and integration (relationship) (question 4), and in these cases, the mirror analysis was performed.

With the collected information, a database was prepared using the Excel Program[10]. Data analysis was performed using the Stata 12.1 program. In the descriptive analysis, categorical variables were presented by frequency distribution (percentage) and numerical variables by measures of central tendency and dispersion (median and its quartiles). The IMI analysis was performed by calculating the arithmetic mean of the 45 items, composing the overall mean score (OMG) and each subscale/domain was defined by means of the arithmetic mean of the set of items that compose it, defining the mean score per subscale (MSS). The seven answer options (1 to 7) were considered, ranging from 1 = not true, 4 = somewhat true and 7 = very true. The gradation of the scores was defined arbitrarily, since there were no previously defined gradations, considering the authors of the original instrument (IMI) themselves before its translation and cross-cultural adaptation[10]. This gradation was carried out based on the need to better specify the motivational state assessed, with the following cutoff points being defined: ≤3.0 (not true/not motivated), >3.0 and <6.0 (somewhat true/motivated) and >6.0 (very true/very motivated).

The project was approved by the Research Ethics Committee of Faculdade Pernambucana de Saúde under CAAE number: 50408021.7.0000.5569 and Opinion Number 4.934.317.

RESULTS

A total of 115 students were included, whose age ranged from 18 to 35 years with a median of 21 years (IQR=20 to 23 years). Students attending the first four years of medical school were included in the study.

Regarding the motivation assessed by the IMI and considering the cutoff points for analysis, the following categories were observed: three students were unmotivated (OMS ≤3.0), corresponding to 2.6%, 111 students were motivated (OMS >3.0 and <6.0), corresponding to 96.5% of them and one student was very motivated (OMS ≥6.0), corresponding to 0.86%. When motivation was assessed by subscales, the following MSS were observed: Interest/pleasure 4.40, Perceived competence 4.24, Effort and importance 4.37, Pressure/tension 3.73, Perception of choice 4.17, Value/utility 5.61 and Integration (relationship) 4.16, indicating motivation in all subscales (Chart 1).

The answers to the IMI proved to be reliable, since a Cronbach's alpha of 0.92 was obtained. Since the arithmetic means of the responses are used for the IMI analysis, composing the overall mean scores and by factor, data normality was evaluated using the Kernel density curve, which indicated a normal distribution (Figure 1).

Regarding the sociodemographic variables, most students were female (64.3%) and single (97.5%). Regarding

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housing, the majority stated that they lived in a household with a number greater than or equal to 6 rooms (53.0%) and there was a number greater than or equal to 4 residents in the household (52.2%) (Table 1). In addition, all students had an income ≥ 15 minimum wages.

Regarding the academic status, 7.8% stated they had a previous degree. Most students tried two or more times to enter college (60.0%). A little more than half of the students said they had no previous experience with face-to-face tutoring (56.5%).

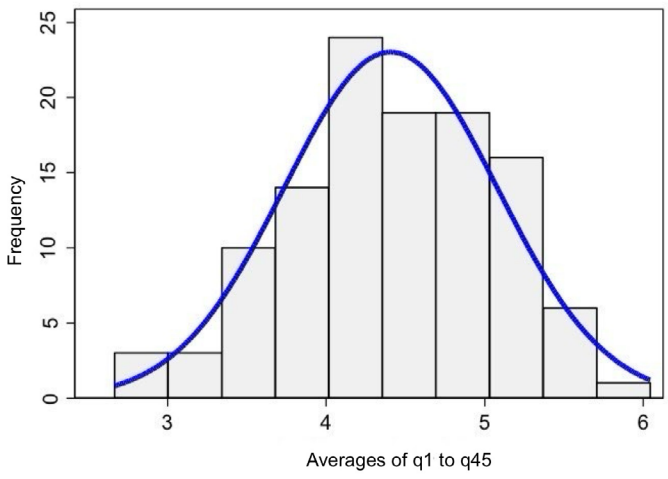
Regarding access to technology and infrastructure for tutoring, most students stated they had their own place to study, without noise and were able to be alone in this place (respectively 69.6%, 62.6% and 88.7%). Regarding internet access, most of them also reported having good quality internet (78.3%), but most reported problems with connection during tutoring (93.0%). The computer was the most often used equipment (93.0%) and with good operation reported by 92.0% of the students (Table 2).

Chart 1. Mean Sector/Subscale scores (MSS) of the Intrinsic Motivation Inventory.

Subscales	MSS	Classification
Interest/pleasure	4.40	Motivated
Perceived competence	4.24	Motivated
Effort and importance	4.37	Motivated
Pressure/Tension	3.73	Motivated
Perception of choice	4.17	Motivated
Value/Utility	5.61	Motivated
Integration	4.16	Motivated

Source: Prepared by the authors.

Figure 1. Density of the intrinsic motivation score of medical students from a school with an active methodology in the Northeast of Brazil, 2021/2022.



Source: Prepared by the authors.

Table 1. Frequency distribution of study participants, according to the sociodemographic status variables – Recife, 2021-2022.

Variable	Frequency	Percentage
Sex		
Female	74	64.3
Male	41	35.7
Marital status		
Single	110	95.7
Common-law marriage	5	4.3
Rooms		
< 6	54	47.0
≥ 6	61	53.0
Residents in the household		
<4	55	47.8
≥4	60	52.2
Presence of pets		
Yes	44	38.3
No	71	61.7

Source: Prepared by the authors.

Table 2. Frequency distribution of study participants, according to variables of access to technology and infrastructure for tutoring – Recife, 2021-2022.

Variable	Frequency	Percentage
Place is used only during tutoring and study		
Yes	80	69.6
No	35	30.4
Noise during tutoring		
Yes	43	37.4
No	72	62.6
Can be alone while tutoring		
Yes	102	88.7
No	13	11.3
Passage of people during tutoring		
Yes	24	20.9
No	91	79.1
Internet access		
Yes	114	99.1
No	1	0.9
Good quality internet		
Yes	90	78.3
No	25	21.7

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When asked about COVID-19 infection, approximately one-third of the students said they had the disease (21.7%), and in 12.0% of the cases it was severe. In 77.4% of the cases, they reported that a relative had the disease and 21.7% claimed to have lost someone in the family as a result of COVID-19 (Table 3).

DISCUSSION

The percentage of motivated students surprised the authors at first, since, in a context of a pandemic and the need to quickly adapt to the new format of the learning environment, it was expected that these facts would contribute negatively to the students' motivational state.

In an attempt to explain the observed levels of motivation, it is possible to suggest the need to change the students' focus from an adverse context to dedicate themselves to learning. There may have been a psychic defense mechanism of compensation, based on the attempt to balance what is negative, uncontrollable, which in this case can be taken as the SARS-CoV2 pandemic, investing in the study environment and interaction between classmates that remote tutoring provided[18].

Another aspect that may have favored student motivation would be the availability of an adequate physical study environment for participating in tutoring, since 69.6% of them stated they had their own place to study and 88.7% were able to be alone in this place, although 93.0% of them reported problems with the internet at some point.

It was observed that the "Interest and pleasure" and "utility value" subscales showed a higher mean evaluation score. The interest and pleasure subscale refers to enjoying performing the activity and doing it with enthusiasm and interest, finding it enjoyable. This finding is attributed to the aspects previously reported above, to explain motivation in general, such as the need to stay focused out of a very difficult situation, such as the pandemic, and the good structure available for study, such as the virtual learning environment and the appropriate physical environment at home.

The utility value subscale, in turn, implies the perception of the usefulness of the activity performed for academic training and future professional life. It is speculated that this motivation would be inherent to every student's profile, especially medical students, and perhaps it does not depend on the context experienced by them.

The findings of the current study were also observed in a study carried out during the first semester of 2020, at a federal university in Santa Maria, state of Rio Grande do Sul, Brazil, which uses traditional methodology and aimed to evaluate the remote teaching of Epidemiology for health courses at the institution, showing that, due to the good technological structure, there was greater student adherence and satisfaction with remote teaching[19]. Another study carried out in Croatia, also with the traditional teaching methodology in May 2020, also during the pandemic period, involving nine health education institutions that adhered to remote teaching, also observed that about

Table 2. Continuação.

Variable	Frequency	Percentage
Internet problems		
Yes	107	93.0
No	8	7.0
Uses computer for tutoring		
Yes	107	93.0
No	8	7.0
Uses cell phone for tutoring		
Yes	31	27.0
No	84	73.0
Uses tablet for tutoring		
Yes	17	14.8
No	98	85.2
Properly functioning device		
Yes	106	92.2
No	9	7.8

Source: Prepared by the authors.

Table 3. Frequency distribution of study participants, according to variables associated with the COVID-19 pandemic condition – Recife, 2021-2022.

Variable	Frequency	Percentage
COVID-19 infection		
Yes	25	21.7
No	90	78.3
Severe COVID-19 infection		
Yes	3	12.0
No	22	88.0
Relatives with COVID-19		
Yes	89	77.4
No	26	22.6
Relatives with severe COVID-19		
Yes	30	33.7
No	59	66.3
Loss of someone to COVID-19		
Yes	25	21.7
No	90	78.3

Source: Prepared by the authors.

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65.0% of the participants were motivated, as much as, or even more than in face-to-face classes[20].

On the other hand, another study, developed in Pakistan during the coronavirus pandemic in April 2020, with high school and higher education students from different courses, which aimed to evaluate, through the application of a questionnaire with Likert scales the relationship between sleep quality, time on social media, students' mental health, and motivation of students from different educational levels, showed that 86.0% of the students were not motivated. The authors concluded this may have occurred due to the lack of perception of time, associated with increased consumption of social media, with sleep quality worsening and direct interference in the mental health of students, which led to demotivation[20,21,22].

In Brazil, a study carried out at Universidade Estadual Paulista, with students from all courses of the institution, during the same pandemic period, using the traditional methodology, showed that approximately 70.0% of the students considered their performance inferior and 83.2% still preferred in-person classes. The authors considered that this may have occurred due to the different methodologies and didactics used by the teachers, which may have interfered in the students' perception[23].

A study conducted in August 2021, involving business administration students at a university in Rio de Janeiro, Brazil, which aimed to analyze these students' perception regarding participation and engagement in face-to-face and remote classes, showed the low participation of higher education students in remote classes and the increase in their participation and engagement when attending in-person classes[24].

In the present study, the fact that only one student was very motivated can be explained by the context of the pandemic itself, by the need to quickly adapt to a new learning environment format, as mentioned before, with new dynamics in the tutorial group and the way the tutor performs. It should also be noted that during a certain period of the pandemic, the laboratories for practical training were also being performed remotely.

Although in the present study no analysis was performed of the association between the assessed variables and the study outcome, which would be the students' motivation, some reflections can be made between these variables and the motivation found, according to studies identified in the literature.

Most of the students in the present study stated that it took them more than two attempts to enter college (60.0%); another study carried out with medical students at the same institution where the present study was developed, showed that the lower number of attempts to enter the medical course was associated with greater motivation in general[13]. The study suggests that this may have occurred because, normally, these students feel more assured and confident.

A study carried out at a university in the state of Paraná, Brazil, with 122 students from the Accounting sciences course, evaluated, among other things, the factors related to the students' intrinsic and extrinsic motivation and their association with academic performance, and observed that academic performance was not influenced by the age factor[24]. Regarding the observed median age of 21 years, and the interquartile range of 20 to 23 years, that means that 75.0% of the students were 23 years old or younger.

In the present study, favorable socioeconomic factors were observed in relation to the structure of the student's home, such as adequate internet connection and computer for uninterrupted use of online classes. This fact may have contributed to the motivation, despite the epidemiological moment, as it may be related to the greater convenience of the online environment.

A study carried out in Saudi Arabia, during the pandemic period, in which health students were evaluated qualitatively and which aimed to analyze the effectiveness of remote teaching, as well as its impediments to student engagement, showed that students preferred and engaged more in remote teaching, due to the optimization of time[22]. In India, a study involving students from several institutions also reported advantages in the online format, including easy access to classes, in addition to the flexibility of schedules sometimes[25].

However, the remote format has its weaknesses, especially for a certain student profile. A qualitative study carried out in Spain, involving 32 health students, observed a greater difficulty in adapting among the older students or those with family and work responsibilities, in addition to those with limited access to the internet[26]. This profile was not found in most of the participants in the current study, especially regarding the issue of students with double burden at home because they were parents, as 95.7% of them were single.

Regarding the pandemic period, 21.7% of the students in the present study reported having had the disease and the loss of a close relative. A study carried out at the same educational institution, in the same period, but with dental students, identified that there was no significant difference between those who had a positive diagnosis for COVID-19 compared to those who did not[27].

Resilience is, ultimately, the individual's ability to adapt and resist the pressure of adverse situations[28,29]. Although most students had good living conditions, characterizing a privileged population, we observed that 77.4% of the students reported having relatives with COVID and 21.7% stated they had lost

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someone in their family as a result of the disease, a fact that points to an adverse situation and shows a certain resilience on the part of students, as most were motivated. Although the main context to consider the presence of resilience on the part of students was the pandemic, without considering other aspects involved, the importance of this event, experienced worldwide as a catastrophe, and all its implications and consequences on people's lives is highlighted. This was also observed in a study carried out in Kazakhstan, with first-year medical students, in 2020, which showed that, even in the face of adverse conditions resulting from the pandemic, students showed minimal interference in their academic motivation[30].

The present study had some difficulty in verifying the association between the assessed variables and intrinsic motivation. This occurred because most of the students comprised practically a single group, as 96.5% were in the group of motivated individuals, making it impossible to identify two groups for comparison and, therefore, the analysis that would allow the proof of the hypotheses raised theoretically, which, despite their plausibility, can only be considered as inferences or conjectures.

In light of the limitations found, it can be said that the students were able to adapt to a new learning format, even in an adverse context. Although the educational institution in which the study was carried out already used a virtual learning environment for some pedagogical practices before the pandemic, it was not used to carry out tutorial groups. The experience lived during the pandemic period made it possible to expand and qualify the use of the remote environment, including as an alternative to be used in cases of need without harming the students' motivation for learning.

CONCLUSIONS

Overall, the students were motivated to participate in tutorial groups in the remote format, despite the rapid change in the learning environment and the context of the COVID-19 pandemic. Favorable socioeconomic factors in relation to the structure of the student's home, such as access to the internet and computer, may have contributed to the motivation, as well as the need to change the focus a little from the adverse context of the pandemic, considering the risk of falling ill and having the disease and the death of close relatives. The role of an active methodology in motivation is also reinforced, especially PBL, in which one of its foundations is based on the assumptions of autonomous or metacognitive learning, whose purpose is to develop in students the ability to identify and create strategies to overcome the obstacles that arise during their learning process.

AUTHOR CONTRIBUTIONS

Bruna Malta Castro, Maria Luísa de Oliveira Maximino Pessoa, Vanessa Tenório Rodrigues, Flávia Patrícia Morais de Medeiros and Ana Rodrigues Falbo participated in all stages from the study design to the final phase of manuscript preparation. Maria de Fátima da Costa Caminha participated in the final phase of manuscript writing, editing and review.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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REFERENCES

1. Souza SC de, Dourado L. Aprendizagem Baseada em Problemas (ABP): um método de aprendizagem inovador para o ensino educativo. Holos. 2015;5:182-200.
2. Dolmans DHJM, Schmidt HG. What do we know about cognitive and motivational effects of small group tutorials in problem-based learning? Adv Heal Sci Educ. 2006;11(4):321-36.
3. Baptista LP, Cortizo GS, Guedes JG, Souza A, Moury L, Sanchez F, et al. Elaboração e validação de instrumento de avaliação da qualidade da preceptoria clínica em hospital escola no Nordeste do Brasil. Reconhecimento de apoio ao estudo: Faculdade Pernambucana de saúde (FPS), trabalho acadêmico através do projeto de iniciação científica (PIC). 2019;1-25.
4. Walsh A. The tutor in PBL: a novice's guide. 2005:1-36. [acesso em 10 fev 2025]. Disponível em: https://srs-slp.healthsci.mcmaster.ca/wp-content/uploads/2022/08/novice-tutor-guide-2005.pdf
5. Barret T, Moore S. New approaches to problem-based learning. Routledge. Abingdon; 2010. 295 p.
6. Toledo Júnior ACC, Ibiapina CC, Lopes SCF, Rodrigues ACP, Soares SMS. Aprendizagem baseada em problemas: uma nova referência para a construção do currículo médico. Rev Méd Minas Gerais. 2008;18.2:123-31.
7. Appel M, Wendt GW, Lima Argimon II de L. A teoria da autodeterminação e as influências sócio-culturais sobre a identidade Psicol Rev. 2011;16(2):351-69. doi: https://doi.org/10.5752/P.1678-9563.2010v16n2p351.
8. Ryan RM, Deci EL. Intrinsic and extrinsic motivations: classic definitions and new directions. Contemp Educ Psychol. 2000;25(1):54-67.
9. Kusurkar RA, Croiset G, Galindo-Garré F, Ten Cate O. Motivational profiles of medical students: association with study effort, academic performance and exhaustion. BMC Med Educ. 2013;13(1):1-8.
10. Center for Self-Determination Theory. Intrinsic Motivation Inventory (IMI). CSDT; 2015 [acesso em 10 fev 2025]. Disponível em: http://www.selfdeterminationtheory.org/intrinsic-motivation-inventory/.
11. Hosmer DW, Lemeshow S SR. Applied logistic regression. 3rd ed. John Wiley & Sons. Nova Jersey; 2013. 500 p.
12. Ten Cate TJ, Kusurkar RA, Williams GC. How self-determination theory can assist our understanding of the teaching and learning processes in medical education. AMEE Guide No. 59. Med Teach. 2011;33(12):961-73
13. Azevedo PTÁCC de, Caminha M de FC, Andrade CRS de, Godoy CG de, Monteiro RLS, Falbo AR. Motivação intrínseca do estudante de Medicina de uma faculdade com metodologia ativa no brasil: estudo transversal. Rev Bras Educ Med. 2019;43(1 supl 1):12-23.
14. Borges MC, Chachá SGF, Quintana SM, Freitas LCC RM. Aprendizado baseado em problemas. Rev USP. 2014;47(3):301-7.
15. Stentoft D. Problem-based projects in medical education: extending PBL practices and broadening learning perspectives. Adv Heal Sci Educ. 2019;24(5):959-69. doi: https://doi.org/10.1007/s10459-019-09917-1.

DOI: https://doi.org/10.1590/1981-5271v49.1-2024-0102.ING

16. Brasil. Medida Provisória nº 934, de 2020. Estabelece normas excepcionais sobre o ano letivo da educação básica e do ensino superior decorrentes das medidas para enfrentamento da situação de emergência de saúde pública de que trata a Lei nº 13.979, de 6 de fevereiro de 2020 [acesso em 2021 abr. 18]. Disponível em: https://www.in.gov.br/en/web/dou/-/medida-provisoria-n-934-de-1-de-abril-de-2020-250710591.

17. Vieira MF. Desafios na educação a distância no Brasil: um olhar dos envolvidos no processo. ticEDUCA2016. 4º Congresso Internacional TIC na Educação, 2016, Lisboa, 2016. Lisboa: Universidade de Lisboa; 2016.

18. Sadock BJ, Sadock VA. Compêndio de psiquiatria. 11a ed. Porto Alegre: Artmed; 2016.

19. Ries EF, Rocha VMP, Silca CGL. Evaluation of remote teaching of epidemiology at a public university in Southern Brazil during the Covid-19 pandemic. SciELO Preprints. 2020. doi: https://doi.org/10.1590/SciELOPreprints.1152.

20. Puljak L, Čivljak M, Haramina A, Malisa S, Cavic D, Klinec D, et al. Attitudes and concerns of undergraduate university health sciences students in Croatia regarding complete switch to e-learning during Covid-19 pandemic: a survey. BMC Med Educ. 2020;20(1):2-11. doi: https://doi.org/10.1186/s12909-020-02343-7.

21. Ali A, Siddiqui AA, Arshad MS, Iqbal F, Arif TB. Effects of Covid-19 pandemic and lockdown on lifestyle and mental health of students: a retrospective study from Karachi, Pakistan. Ann Med-Psychol. 2022;180(6):S29-S37. doi: https://doi.org/10.1016/j.amp.2021.02.004.

22. Bolatov AK, Gabbasova AM, Baikanova RK, Igenbayeva BB, Pavalkis D. Online or blended learning: the Covid-19 pandemic and first-year medical students' academic motivation. Med Sci Educ. 2022;21(1):221-8. doi: https://doi.org/10.1007/s40670-021-01464-y.

23. Gonçalves TM. O ensino remoto emergencial na unesp devido à pandemia de Covid-19: uma análise baseada na percepção estudantil [tese]. São Paulo: Universidade Estadual Paulista; 2021

24. Borghi SCM. Investigação e proposta de intervenção pedagógica sobre a baixa participação do aluno do ensino superior nas aulas remotas durante a pandemia Covid-19. 2021. 43 p. Trabalho Final de Curso (Pós Graduação Lato Sensu em Práticas Pedagógicas para Professores) - Instituto Federal do Espírito Santo, Colatina, 2021. [acesso em 2025 mar. 12]. Disponível em: https://repositorio.ifes.edu.br/handle/123456789/1824?show=full

25. Rahman M, Uddin M, Dey A. Investigating the mediating role of online learning motivation in the Covid-19 pandemic situation in Bangladesh. J Comput Assist Learn. 2021;37(6):1513-27. doi: https://doi.org/10.1111/jcal.12535.

26. Ramos-Morcillo AJ, Leal-Costa C, Moral-Garcia JE, Ruzafa-Martinez M. Experiences of Nursing students during the abrupt change from face-to-face to e-learning education during the first month of confinement due to Covid-19 in Spain. Int J Environ Res Public Health. 2020;17(15):2-15 doi: https://doi.org/10.3390/ijerph17155519.

27. Cordeiro GP, Silva TCL, Soares DM. Avaliação da motivação intrínseca de estudantes de odontologia à aprendizagem baseada em problema de forma remota durante o Covid-19 [trabalho de conclusão de curso). Recife: Faculdade Pernambucana de Saúde; 2022.

28. Pinheiro DPN. A resiliência em discussão. Psicol Estud. 2004;9(1):67-75.

29. Sordi AO, Manfro GG, Hauck S. O conceito de resiliência: diferentes olhares. Rev Bras Psicoter. 2011;13(2):115-32.

30. Tempski P, Arantes-Costa FM, Kobayasi R, Siqueira MAM, Torsani MB, Amaro BQRC, et al. Medical students' perceptions and motivations during the Covid-19 pandemic. PLoS One. 2021 Mar 17;16(3):e0248627. doi: https://doi.org/10.1371/journal.pone.0248627.