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Time management in the routine of university students: results of an intervention

A gestão do tempo na rotina universitária: resultados de uma intervenção

Gestión del tempo en la rutina universitaria: resultados de una intervención

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Abstract

Those who make use of time management skills find them to be a useful tool for the purpose of overcoming procrastination tendencies and fostering better task management. These two matters — procrastination and task management — are two issues of considerable relevance in the lives of many university students. Poor time management skills can result in an unbalanced relationship with one's academic responsibilities, resulting in an increase in stress levels. Uneven distribution of tasks throughout the week, procrastination, task overload and the absence of strategies for eliminating distractions are some of the possible means through which a student can undermine their own well-being as it relates to academic life. These bad practices may be remedied by adopting time management strategies. With the purpose of fostering such strategies, two online workshops were developed. A total of 17 students participated in the intervention, of whom, 12 showed improvements in their time management skills, with two displaying particularly remarkable positive changes. From these results, it was concluded that these interventions can be of great value, and that, despite the interventions being brief, it is possible to obtain results that lead to the improvement of participants' time management skills.
Keywords: university students; time management; stress; procrastination

Resumo

As habilidades de gestão do tempo fornecem àquele que se utiliza delas uma boa ferramenta na superação da procrastinação e na gestão de tarefas. Estes, por sua vez, são dois problemas que estão presentes na vida de muitos estudantes do Ensino Superior. Má gestão do tempo pode resultar em uma relação desequilibrada com as responsabilidades acadêmicas, o que pode levar a um aumento do estresse. A falta de planejamento das atividades, a tomada de um número de tarefas excessivo para si e a ausência de estratégias para eliminação de distratores podem minar o bem-estar na vida acadêmica. Tais práticas podem ser remediadas pela adoção de estratégias de gestão do tempo. Com o fim de divulgar e fomentar tais estratégias, foram elaboradas oficinas em formato online. Participaram das oficinas um total de 17 estudantes, dos quais, 12 apresentaram melhoras na sua relação com a gestão do tempo e, destes, dois apresentaram mudanças positivas particularmente notáveis. Conclui-se a partir destes resultados que tais intervenções

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podem ser de grande valia, e que mesmo com intervenções breves é possível obter resultados que confirmem a melhora nas habilidades de gestão do tempo dos participantes.

Palavras-chave: estudantes universitários; gestão do tempo; estresse; procrastinação

Resumen

Las habilidades de gestión del tiempo proporcionan una buena herramienta en la superación de la dilación y en la gestión de tareas. Estos, a su vez, son dos problemas que están presentes en la vida de muchos estudiantes de educación superior. La mala gestión del tiempo puede resultar en una relación desequilibrada con las responsabilidades académicas, lo que puede conducir a un aumento del estrés. La falta de planificación de las actividades, la toma de un número de tareas excesivo para sí y la ausencia de estrategias para la eliminación de distracciones pueden minar el bienestar en la vida académica. Estas prácticas pueden remediarse adoptando estrategias de gestión del tiempo. Con el fin de divulgar y fomentar tales estrategias, se elaboraron talleres online. Participaron en los talleres un total de 17 estudiantes, de los cuales 12 presentaron mejoras en su relación con la gestión del tiempo, dos de estos presentaron cambios positivos particularmente notables. Se concluye a partir de estos resultados que tales intervenciones pueden ser de gran valor y que incluso con intervenciones breves es posible obtener resultados que confirmen la mejora en las habilidades de gestión del tiempo de los participantes.

Palabras clave: estudiantes universitarios; gestión del tiempo; estrés; procastinación

When entering higher education, university students embark on a journey in which they may encounter problem-solving situations that demand an increased level of autonomy. In this context, various attributes are expected of students to navigate these situations healthily. These attributes include a strong repertoire of social skills, coping strategies, and the ability to manage their commitments effectively (Sahão & Kienen, 2021).

Time management is closely linked to a set of habits and behaviors aimed at using time efficiently, enhancing productivity, and consequently reducing stress episodes (Oliveira et al., 2016). Accordingly, effective management of commitments and tasks within the context of higher education contributes to both academic and professional success as well as the overall well-being of students (Yoshiy & Kienen, 2018).

In a study conducted by Dias et al. (2019), stressors related to inadequate time management were identified as one of the main challenges faced by the majority of students, both in the academic and personal contexts. These findings emphasize the importance of addressing time management skills among students. In this context, it becomes evident that habits and behaviors conducive to efficient organization can be trained and acquired, even within the university context (MacCann et al., 2012).

A study conducted by Oliveira et al. (2016) aimed to describe the experience of implementing time management workshops for undergraduate and postgraduate students in a public university of Rio Grande do Sul, Brazil. These workshops spanned eight sessions and covered concepts related to how these students typically organized their

time-related issues. The authors highlighted the high demand for the workshop, indicating the paramount concern among university students regarding this topic. Furthermore, they categorized the main obstacles into four categories: behaviors related to procrastination, difficulties in saying "no" to third-party demands, challenges in balancing study and leisure, and problems in managing the workload of their courses.

Within this group of complaints, it is evident that students, in general, face issues in planning, executing, and controlling their tasks, dealing with distractions, and combating procrastination (Freires et al., 2021). Vieira-Santos and Malaquias (2022) highlighted the relationship between procrastinatory behaviors and poor time management, which, according to the authors, is associated with other aspects such as the inability to define goals and priorities, establish action plans and task lists, and manage unforeseen events and deadlines. These situations demonstrate problems related to the practice of organizing and managing academic activities; however, there are theories and techniques that can assist in improving time management.

The Time Management Model, theorized by Estrada et al. (2011), is divided into three major phases: planning, management, and control. The planning phase, the first of this model, essentially refers to the act of foreseeing the organization of tasks and meeting their deadlines. This includes the possibility of breaking down a large task into smaller ones. The second phase, management, encompasses the execution of tasks, requiring a balance between discipline and flexibility while adhering to the plan (Estrada et al., 2011). Here, the need to avoid distractions and procrastination is crucial. The third and final phase, control, is considered a learning phase. In this phase, a comparison is made between the actual practical execution and the initial plan. It is used to verify whether the planned tasks are actually being executed and producing the expected results and, if not, to identify the causes of this discrepancy (Estrada et al., 2011).

In addition to theories like that of Estrada et al. (2011), there are various techniques that can assist individuals in self-organization. Regarding weekly and daily planning, the importance of setting priorities can be emphasized. It is also necessary to establish goals (Vieira-Santos & Malaquias, 2022). In the academic environment, time management is understood not simply as filling out study schedules but as a complex and comprehensive process that requires students to reflect on goals and priorities not only directly related to the university (Marcilio et al., 2021). This idea is aligned with the understanding that different schools of thought share some common characteristics, such as organization, control, and prioritization (Oliveira et al., 2016). Oliveira et al. (2016) stated that the essence of personal management ideas can be captured in the phrase "organize and execute according to priority" (p. 225).

Using the concepts of organization and prioritization, time management is understood as a series of habits or behaviors that entail the effective use of time allocated to tasks, assisting in productivity and stress reduction (Oliveira et al., 2016). It can be argued that much of the stress experienced by an individual results from a feeling of lack of control over their obligations and their execution (Leahy et al., 2013). Weekly and daily planning is used not only to identify how students perceive their organization and the use of their time but also to encourage self-monitoring and self-control behaviors. According to Leahy et al. (2013), these behaviors can be acquired through life experience, training, or practice.

Through such planning, it is also possible to identify potential deficits in organization, as it often reveals the absence of time-consuming activities such as commuting or rest (Marcilio et al., 2021). Furthermore, in line with the idea of prioritization, it is necessary to set short, medium, and long-term objectives. To assess whether certain tasks have been successfully completed, individuals must reflect on their

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learning process, requirements, and academic and personal goals (Alves & Teixeira, 2021; Marcilio et al., 2021), especially when these goals are pursued over an extended period.

It is essential to reflect on one's own academic experience, profession, and, in general, how short-, medium-, and long-term goals are articulated and aligned coherently with one's daily life. Placing goals in a temporal perspective, along with reflecting on one's desires, needs, and priorities, can facilitate the operationalization of what needs to be done to achieve them or the possibility of readjusting these objectives. With clear goals and tasks to be completed, it is also necessary to be aware of the real or approximate time required for each activity. This adjustment takes into account external factors (such as required materials, deadlines, real demands, etc.) and internal factors (mood, energy, attention, etc.) (Marcilio et al., 2021).

Faced with goals that seem disconnected from their current reality, it is not uncommon for students to adopt dysfunctional behaviors such as inadequate strategies to achieve certain goals or procrastination behaviors (Pereira & Ramos, 2021; Vieira-Santos & Malaquias, 2022), which can have consequences in their personal lives. Therefore, this work aims to present and evaluate the effect of an intervention conducted in the form of workshops directed toward university students. The intervention aims to identify the strategies used by students and encourage reflection on their time management practices, as well as to provide strategies that contribute to coherence between daily activities and the goals defined by the participants.

Materials and Method

Participants

Participants were 17 university students, whose mean age was 28.46 years ($SD = 15.35$). Among these participants, 82.4 % were female, and 17.6 % male. They were from both public (82.4 %) and private (17.6 %) universities and were recruited from two workshops on time management for university students. The first workshop, held in 2020, had nine university student participants, while the second workshop in 2021 had eight participants. Inclusion criteria required participants to be currently enrolled in courses, while exclusion criteria stipulated that they should not be enrolled in distance learning programs. Most of the participants were enrolled in the Psychology program (76.5 %), followed by Nursing (11.7 %), Cultural Production (5.9 %), and Geography Teacher Education (5.9 %). Regarding socioeconomic status, 5.9 % were in social class A, 11.7 % in class B1, 23.6 % in class B2, 41.2 % in class C1, and 17.6 % in class C2. All participants attended at least 80 % of the workshop in which they were enrolled.

Instruments

The Sociodemographic Questionnaire aimed to identify information characterizing the sample. It consisted of questions related to occupation, affiliation with a university, social class, gender, and age, among others.

The Time Management Inventory (TMI) (Krausz, 1994) originally comprises 96 items (39 items in its adapted version) and assesses time management based on personal characteristics with which the respondent identifies or not. The instrument used in the present study was the latter version (Pellegrini et al., 2012), consisting of 39 items. These items are divided into the following categories: Time Planning, Crisis Management, Personal Organization and Self-discipline at Work, Communication, Decision Making, Problem Diagnosis, Perfectionism, Personal Goal Setting, Work Flexibility, and Concentration Capacity. Each of these categories includes three statements. For each

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question, the instrument provides response options of "yes" or "no." For scoring, one point is assigned for each "yes" response and no points for "no" responses. Results are evaluated by classifying respondents into three groups: up to 15 points: reasonably or adequately manages time; 16 to 31 points: manages time poorly or mediocrely; 32 to 39 points: does not manage time effectively. The Cronbach's alpha for this instrument in the sample was .77.

Data collection procedure

  The data were collected from two workshops on time management for university students. These workshops were organized and conducted by students from the Psychology undergraduate and Social Psychology graduate programs of a public institution. They were based on literature review research and theoretical references on the topic, resulting in the content covered in each session (Table 1). The dissemination was carried out through the laboratory's social media channels and personal networks of the organizers, and the execution took place online via the Zoom platform in September 2020 and again in July 2021. Since the content was identical in both instances, the material was treated as a single group. All participants provided informed consent by signing the consent form and completed the Sociodemographic Data Questionnaire and the Time Management Inventory (TMI) (Krausz, 1994, adapted by Pellegrini et al., 2012) in the first session (T1, pre-intervention). Only the materials of students who attended at least four workshop sessions were analyzed, as the workshop consisted of five sessions held once a week, with an average duration of two hours per session, without breaks.

  The sessions were structured in six moments: 1) The first, in the initial session, was used for personal introductions, in the subsequent sessions for recovering and discussing the tasks proposed for the week; 2) Dialogical exposition: a theoretical presentation on the topic with visual support (slides and illustrative videos). During this moment, psychoeducational activities were conducted, encouraging participant interaction; 3) Group discussions: in which discussions were held among and with participants about time management issues and the sharing of experiences. In this moment, the participants were encouraged to freely discuss the proposed topic during the time established for this; 4) Experiences: practical activities were conducted, aiming to encourage participants to train in organizing their own time by planning short, medium, and long-term goals (as support materials, planning sheets in digital document format were provided before each session, and interactive activity links were shared during the sessions). These directed activities aimed to stimulate students to prioritize (for example, fictitious tasks and circumstances were presented to allow participants to weigh priorities in that context). Additionally, it was also possible to discuss how to put the learned content into practice, using the participants' spontaneously shared experiences as examples; 5) Homework: participants were tasked with completing organization activities based on the day's theme. These exercises aimed to encourage engagement with the topic outside of the session, as well as to help practice what was learned; and finally, 6) Feedback: at the end of each meeting, participants were asked for their opinions on what was covered, and any questions and suggestions were reviewed in the final meeting. After completing the five sessions, participants filled out the TMI questionnaire for the second time (post-intervention), with T2 occurring on the day following the intervention's conclusion.

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Table 1

Organization of the workshop by session

Sessions	Themes Covered
Session 1	Time management problems and their consequences: definition of the time management model and the impact caused by failures in its three stages (planning, management, and control).
Session 2	Sources of distractions and tools: resources and strategies for managing time and reducing the influence of distractions.
Session 3	Vertical and weekly planning: how to plan the week, prioritize tasks, and categorize activities.
Session 4	Organization and planning: activity management and daily planning, the importance of leisure and quality sleep.
Session 5	General review of the topics covered.

Data Analysis Procedure

Due to the small sample size ($n = 17$), a non-parametric procedure was chosen to test the hypothesis of differences between groups. A Mann-Whitney test was conducted to assess whether there were substantial statistical differences between the pre-intervention scores of the participants from 2020 ($n = 9$) and those from 2021 ($n = 8$). Additionally, a Wilcoxon test, suitable for comparisons of repeated measures, was performed, along with the calculation of effect sizes using Pearson's r and confidence intervals generated by bootstrapping. The JT method (Jacobson & Truax, 1991) was also employed to demonstrate the degree of change reliability and clinical significance of individual changes among the participants through the Reliable Change Index (RCI) and the Clinical Significance (CS) score. All tests were conducted using the R programming language (R Core Team, 2021). The *rstatix* package (Kassambara, 2023) in R was used for the Wilcoxon and Mann-Whitney tests, and the *ggplot2* package (Wickham, 2016) was utilized for generating the graphs.

Ethical Procedures

The study was submitted to and approved by the Ethics Committee of Universidade do Estado do Rio de Janeiro, with approval number 5.237.012 and CAAE number 53517321.2.0000.5282. All participants provided informed consent, were informed about possible risks and discomforts, confidentiality, and the absence of benefits and payments, following the guidelines of Resolutions 466/2012 and 510/2016 from the National Health Council regarding research involving human subjects.

Results and Discussion

The Mann-Whitney test indicated no substantial differences between the 2020 and 2021 samples ($U = 15.5$; $z = -1.93$; $p > .05$). Due to this result and the fact that the instruments used and the content of the workshops were the same, it was decided to include all participants in subsequent analyses as a single sample.

Through the Wilcoxon test, it was determined that there was a significant difference between the pre- and post-intervention groups ($T = 18.5$; $z = -2.54$; $p < .05$). This allowed for the identification of the overall differences between the groups. The effect size of the differences was substantial ($r = .61$; cf. Cohen, 1988), indicating a substantial difference between the groups and supporting the effectiveness of the workshop. Table 2 displays the mean scores of participants at different points in the analysis.

Table 2
Differences in Pre- and Post-Intervention Time Management Scores

Moment	$M\pm SD$	Median	Effect size	Confidence interval (95 % BCa CI, 1000 resamples)	
				LL	*UL*
Pre	20.1±5.7	21	.61	.14	.81
Post	17.4±5.4	17			

Note. Mean of negative ranks: -3.3; mean of positive ranks: 3.3.

The JT method was used to assess individual changes among the participants. This method is based on the calculation of the Reliable Change Index (RCI) and the Clinical Significance (CS) score. The RCI is calculated as follows:

$$\text{RCI} = \frac{x_2 - x_1}{\sqrt{2(s_1\sqrt{1 - r_{xx}})^2}}$$

Where x_2 and x_1 represent the post- and pre-intervention scores, respectively; s_1 represents the standard deviation of the pre-intervention group; and r_{xx} represents a measure of reliability of the questionnaire used (in this case, Cronbach's α). This latter measure impacts the extent of the Reliable Change Interval, which represents the margin of error of the measure. The higher the instrument's reliability measure in the sample, the smaller the margin of error, making the changes more reliable and requiring less fluctuation in values for the results to be considered statistically significant.

The Clinical Significance (CS) score can be obtained in three ways, depending on the availability of normative scores (Jacobson & Truax, 1991). The method selected for obtaining the CS without using normative scores involves the equation $M_1 + 2s_1$, where M_1 is the mean of the pre-intervention sample, and s_1 is the standard deviation of the pre-intervention sample. It serves to categorize participants in clinical samples as "recovered" or "not recovered," meaning a participant may show improvement and still fit into a clinical sample or not. Participants with a score high (or low) enough to exceed the CS threshold would be categorized as "recovered" The CS threshold in this sample was 8.61.

The RCI values are standardized to the Z score. A $|z| = 1$ score indicates that the observation is 1 standard deviation above or below the mean (the absolute value of Z is used here because the value can be positive or negative). In a normal distribution, a $|z| = 1.96$ score represents observations in the 2.5 % and 97.5 % percentiles, which represents a probability of occurrence less than 5 %. An RCI greater than 1.96 or less than -1.96

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would be unlikely to occur (with $p < .05$) without indicating a true change (Jacobson & Truax, 1991).

Table 3 presents the changes in the individual scores of each participant before and after the workshop. Four participants had negative changes after the intervention, however, none of them were considered statistically significant. One participant had no change, 10 had positive changes, but within the margin of error, and two had reliable positive changes. Participant 7 had a post-intervention score below the CS threshold, however, within the margin of error.

Table 3
Comparison of the participants' scores before and after the implementation of the workshops

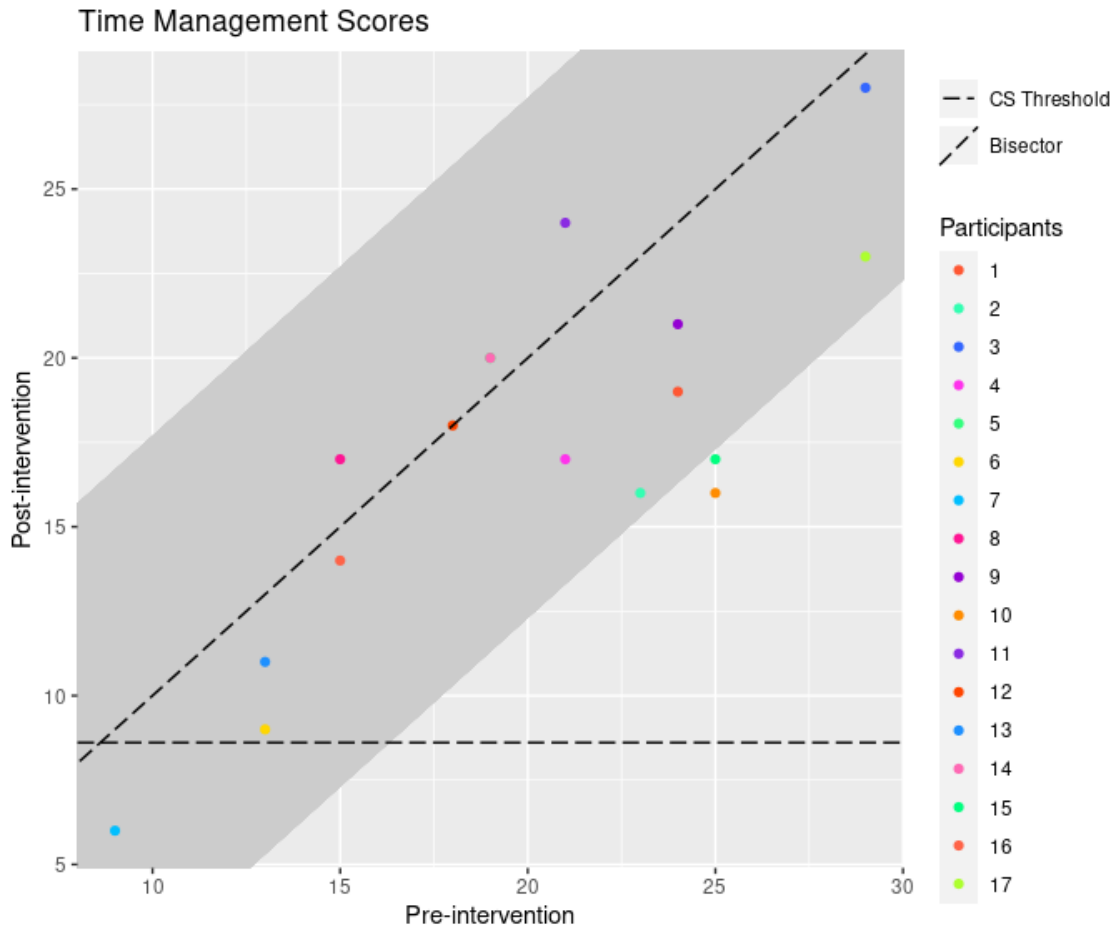| Participant	Pre-Intervention	Post-Intervention	RCI	Interpretation
1	24	19	-1.28	ARC
2	23	16	-1.79	ARC
3	29	28	-0.26	ARC
4	21	17	-1.02	ARC
5	19	20	0.26	ARC
6	13	9	-1.02	ARC
7	9	6[a]	-0.77	ARC
8	15	17	0.51	ARC
9	24	21	-0.77	ARC
10	25	16	-2.31	PRC
11	21	24	0.77	ARC
12	18	18	0.00	ARC
13	13	11	-0.51	ARC
14	19	20	0.26	ARC
15	25	17	-2.05	PRC
16	15	14	-0.26	ARC
17	29	23	-1.54	ARC

Note. RCI: Reliable Change Index. Interpretation: conveys the meaning of these values: ARC: Absence of Reliable Change and PRC: Positive Reliable Change. Negative values represent positive changes because lower scores on the TMI imply better time management.

Figure 1 presents the relative positions of the scores for each participant (P1, P2, P3,..., P17) before and after the workshops. Participants located outside the lower boundary of the Reliable Change Interval, represented by the gray area surrounding the

bisector (dashed diagonal line), are those who indeed demonstrated statistically significant positive changes (with $p < .05$).

Figure 1

Comparison of Pre- and Post-Intervention Scores Graph

Note. The bisector represents the point where pre- and post-intervention scores would be identical. Only participant 12 achieved identical scores at these two time points. Scores above the bisector imply higher scores and scores below it lower scores.

The present study aimed to assess the effect of a workshop-format intervention that provided resources for improved time management. It is understood that various psychosocial difficulties stand out in the adaptation process, among which time management is a significant challenge. In the literature, the importance of time management has been associated with better academic performance, as students with better performance tend to distribute their available time more appropriately between study tasks and other activities in their routines (Marcilio et al., 2021).

The significance of disseminating knowledge about time management has previously been highlighted in earlier studies as a valuable resource for reducing stress and the feeling of lack of control among individuals in general (Leahy et al., 2013; Freires et al., 2021). During the implementation of the intervention, it was observed that this topic was of considerable relevance to the university population, which had already been suggested in other studies (Oliveira et al., 2016; Soares et al., 2023). In another study stemming from time management workshops, Soares et al. (2023) presented participants'

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perceptions of different time management strategies. It was possible to observe that significant themes emerged, including challenges related to meeting deadlines, motivation and expectations regarding the intervention, which included organizing study time and setting priorities, how students manage daily commitments, and distractions identified by students as hindrances to better time organization.

The workshop was developed based on the initial idea presented by Estrada et al. (2011) that a methodological guide for systematizing the steps of planning, managing, and controlling time could be an effective starting point, resulting in improvements in people's daily lives. The authors also stated that a model presenting the key technical and behavioral elements found in the literature could facilitate the understanding and application of time management, which was corroborated by the experiences of the current study. This data was also corroborated by considering the themes that emerged during the intervention, which included daily issues and challenges in time management (Soares et al., 2023).

One of the main gains from the intervention was providing the participants with various tools for constructing a time management model to help control their immediate environments. It is should be highlighted that although these practices are referred to as "time management", they actually involve the administration of activities that can be modified by the individual in interaction with the environment (Yoshiy & Kienen, 2018). The ability to manage one's actions in relation to environmental variables is a significant benefit provided by these models.

Simultaneously, individual aspects were also addressed in the workshop, such as the ability to reflect on one's own academic and personal requirements and goals, as these topics had already been reported as crucial by other researchers (Marcilio et al., 2021). Therefore, encouraging the participants to think about and describe their short-term, medium-term, and long-term goals became a relevant discussion point during the intervention. Additionally, the workshop focused on achieving coherence between daily activities and long-term goals, translating ideas related to career planning into concrete plans, which is one of the aspects reported in the literature that motivates people to see workshops of this kind (Alves & Teixeira, 2021; Oliveira et al., 2016).

It can be affirmed that the intervention led to a significant decrease in the overall group scores in time management. It should be noted that this decrease can be seen as a positive point, as higher scores in the TMI indicate poorer time management skills. It should be considered that the results of the instrument scores are vulnerable to fluctuations that may be attributed to external circumstances such as assessment periods or increased workload at the university, among other personal factors. However, at an individual level, although four participants showed negative changes in time management after the workshop, none of these results were considered statistically significant.

The overall results were positive: although according to the JT method, one participant did not show a difference, and ten participants experienced positive changes within the instrument's margin of error, the general trend, as indicated by the Wilcoxon test, was a substantial improvement with a considerable effect size ($r = .61$) in participants' scores as a result of the intervention. Moreover, two participants achieved reliable positive changes according to individual-level analyses.

It should also be emphasized that the results were collected immediately after the workshop's conclusion, meaning the intervention's effectiveness was confirmed in a short period, shortly after participants' first contact with the discussions and strategies presented. It is possible that the positive effects may be extended depending on the application of the techniques learned by participants in their routines. Therefore, it would be reasonable to assume that the effects of the workshop might be better perceived in the

long term. However, it should be noted that this result may also reflect an immediate adoption of the techniques learned by the participants, and it cannot be guaranteed that the gains would be incorporated into students' routines. Therefore, the results should be interpreted with caution.

The structure of the intervention was developed based on what was presented as relevant themes and effective possibilities of models or strategic planning for time management. Considering how time management was addressed and the predominantly positive outcome of the workshop, it can be concluded that the techniques and strategies proposed to align these models with the participant's own routine seems to be an efficient means of improving time management in the university context.

Furthermore, the workshop experience facilitated the exchange of experiences and suggestions among the participants. Therefore, alongside the opportunity to learn strategies and techniques, the sharing of experiences among the students was also valuable. This opportunity allowed the participants to perceive that their problems are common and not idiosyncratic.

Conclusions

This study aimed to present and evaluate the effect of an intervention conducted with university students. It was observed that the group obtained a lower mean score in relation to their pre-intervention scores, which is a positive outcome, indicating an improvement in the majority of students and aligning with the literature, which suggests that even a brief intervention has positive effects.

However, there are some limitations to this study. One limitation is the short time between the intervention and the final evaluation, with the absence of follow-up data collection. Although the assessment conducted using the JT method allows for a reliable investigation of changes in scores before and after an intervention, it is recommended that a follow-up assessment be conducted to confirm the long-term benefits of the intervention. Furthermore, the analysis was conducted with participants collected one year apart, and in the context of the COVID-19 pandemic, which may be an uncommon situation, despite the similarity in pre-intervention scores between the groups.

Considering the relevance of this repertoire for the academic and professional lives of all students, it is recommended that more workshops be conducted so that more university students can benefit from the practice of better time management and develop improved strategies for managing their time in the university context.

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