

Physical activity and purpose in life of college students in confinement

La actividad física y el propósito en la vida de estudiantes universitarios en situación de confinamiento

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Abstract. Social isolation and generalized confinement in many countries has caused a decrease in physical activity (PA) and an increase in levels of stress, anxiety and depression. Purpose in life is part of people's psychological well-being, and having a clear purpose allows them to face adversities. In this sense, the influence of PA on psychological well-being in situations of confinement makes it necessary for educational and governmental entities to study and promote it. The objective of this work has been to evaluate the incidence with a PA intervention program (Move yourself at home) on the purpose in life during a period of mandatory confinement due to COVID-19. 360 university students participated divided into three groups, control (Sedentary, Sed), and experimental (group with low physical activity, BAct, and physically active, Act). The experimental groups were conducted on a PA intervention program for 11 weeks, from the beginning to the end of the mandatory confinement. A weekly online questionnaire was collected, recording the level of PA (min / week) and the results of the PIL test (purpose in life). The level of PA decreased significantly at the beginning of the confinement and increased significantly in the flexibilization phases. The intervention program was able to help maintain the PA level in participants. PA has a positive effect on the purpose in life and practicing some physical exercise on a regular basis could be a crucial tool to face a state of mandatory confinement.

Keywords: health, sport, coronavirus, life purpose, emotions

Resumen. El aislamiento social y el confinamiento generalizado en muchos países ha provocado una disminución de la actividad física (AF) y un aumento de los niveles de estrés, ansiedad y depresión. El propósito en la vida forma parte del bienestar psicológico de las personas, y tener un propósito claro, les permite enfrentar las adversidades. En ese sentido, la influencia de la AF en el bienestar psicológico en situaciones de confinamiento, hace necesario su estudio y promoción por parte de entidades educativas y gubernamentales. El objetivo de este trabajo fue evaluar la incidencia de un programa de intervención con AF (Muévete en casa) sobre el propósito en la vida durante un periodo de reclusión obligatoria por COVID-19. Participaron 360 estudiantes universitarios divididos en tres grupos, control (Sedentario, Sed), y experimental (grupo con baja actividad física, BAct, y activo físicamente, Act). Los grupos experimentales se sometieron a un programa de intervención de AF durante 11 semanas, desde el inicio hasta el final del encierro obligatorio. Se recogió un cuestionario online semanal, registrando el nivel de AF (min/semana) y los resultados del test PIL (propósito en la vida). El nivel de AF disminuyó significativamente al principio del confinamiento y aumentó significativamente en las fases de flexibilización. El programa de intervención pudo contribuir a mantener el nivel de PA en los participantes. La AF tiene un efecto positivo en el propósito en la vida y la práctica de algún ejercicio físico de forma regular podría ser una herramienta crucial para afrontar un estado de confinamiento obligatorio.

Palabras clave: salud, deporte, coronavirus, propósito de vida, emociones

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Introduction

One of the first behaviors that changed in the population in a condition of mandatory confinement has been the decrease in healthy behaviors, such as the regular practice of PA and the increase in sedentary lifestyle (García-Tascón, Mendaña-Cuervo, Sahelices-Pinto, & Magaz-González, 2021; Intelangelo et al., 2022; Sang et al., 2021; Stockwell et al., 2021; Zamarripa, Marroquín-Zepeda, Ceballos-Gurrola, Flores-Allende, & García-Gallegos, 2021), despite the fact that PA performed on a regular basis can attenuate anxiety and negative moods (López-Bueno et al., 2020).

This being said, during the first 30 days of the COVID-19 pandemic, Tison et al. (2020) found in a sample of individuals from 187 countries (N = 455,404) a decrease of 27.3% in PA (number of steps per day) and in the case of Spain, they indicate that there was a decrease of 15% nine days after the pandemic decree issued by the WHO on March 11, 2020.

Castañeda-Babarro, Arbillaga-Etxarri, Gutiérrez-Santamaría and Coca (2020) found for a sample of 3,800 Spaniards (18-64 years) a decrease of 58.2% in the time used to walk and of 16.8% in vigorous PA, while they detected a significant increase in sedentary lifestyle of 23.8%. Likewise, Maher, Hevel, Reifsteck and Drollette (2021) found in a sample of 107 university students from the United States, a significant decrease in the levels of moderate to intense PA (in min / week). For both cases, these changes in PA levels were attributed to confinement and physical distancing from COVID-19.

In a larger sample of 10,121 participants in 67 countries, Ugbolue et al. (2020) reported a 2.98% increase in sedentary habits and a decrease in PA levels by 2.42%. In a sample of Australian university students, Gallo, Gallo, Young, Moritz and Akison (2020) detected a decrease in PA levels when comparing the results with that of the years 2018-2019, as well as changes in the healthy eating style, with an increase in the intake of foods with a high caloric level for the case Women's.

In this context, there were also problems in the mental and emotional health of people, experiencing negative psychological effects such as stress and anger (Brooks et al., 2020; Velandia, Cuevas, & Salvador, 2022). An increase in the levels of depression, anxiety and sleeping problems in people was also reported as a consequence of the confinement situation (Maher et al., 2021; Ugbolue et al., 2020). One of the key factors for the general psychological well-being of people is the sense and purpose of life (García-Alandete, 2015), which can be key to face the stressful situations that this pandemic has brought. (Arslan, Yıldırım, Karataş, Kabasakal, & Kılınc, 2022; Schnell & Krampe, 2020). In this way, finding the sense of life constitutes the most important motivation of the human being, because when this will to meaning is frustrated, specific pathological symptoms may occur (Noblejas, 1994), associated with mental health, anxiety and depression (Kleftaras & Psarra, 2012).

In Germany, Schnell and Krampe (2020) found that people who had the greatest sense of life and the most self-control had the lowest levels of distress and stress, during and after confinement for COVID-19. In their study, Arslan, Yıldırım, Karataş, Kabasakal and Kılınc (2022) concluded that people with a greater sense of life enjoy better mental health during the crisis generated by the pandemic. Given the importance of the purpose and meaning of life and the possible influence of PA on it, this work aims to know these variables and how they are related in the current situation of confinement due to the coronavirus pandemic.

Methods

Participants

The sample consisted of 360 university students from the University of Malaga, of which 262 (34% men and 66% women) participated continuously during the 11 weeks. For practical reasons and the nature of the present study (intervention focused on natural groups during home confinement) the choice of the sample was for convenience. All participants agreed to participate voluntarily in the present research and freely selected their inclusion in one of the three groups: control, made up of sedentary participants (Sed, $n = 23$), group with low physical activity (BAct, $n = 15$) and physically active students (Act $n = 224$). The average age of the participants was 21 ± 4 years (19-46 years).

The inclusion criteria were: (1) take the subject of "Didactics of Physical Education" in the University Degree of Primary Education; (2) accept informed consent to participate in the "Move at home" study; (3) perform at least eight PIL tests (one per week) in the 11-week duration of the study; (4) do not perform PA (Sed), perform between 80-150 min of weekly PA (BAct) or more than 150 min of weekly PA (Act) during the 11 weeks of the study. All study participants met the inclusion criteria mentioned above.

The study procedures were carried out in accordance with the Spanish regulations for clinical research in humans (Law 14/2007, of July 3, on Biomedical Research) and with the guidelines established in the Declaration of Helsinki.

Procedure

This is a longitudinal investigation with a duration of 11 weeks, which covers from the moment of the start of the state of alarm in Spain according to Royal Decree 463/2020 of March 14, 2020, which restricted many social and sports activities, the suspension of face-to-face education at all its levels and those related to recreation, only allowing those that were strictly necessary for the survival of people and the functioning of institutions.

The experimental groups carried out a PA intervention program called "Move at home" for 11 weeks, from the beginning of compulsory confinement to the end of Phase 1 of the de-escalation. A weekly online questionnaire was collected, in which the level of PA performed in the week prior to its application was recorded (number of sessions, type and volume of PA in min / week for groups BAct and Act) and the PIL test for the assessment of the emotional state of the participants.

The intervention program "Move yourself at home" was carried out through the Virtual Campus of the subject, in which every week multimedia sessions of PA were incorporated and shared that could be carried out at home, in different formats such as Aerobics, GAP, Step, Toning, Spinning, etc., being able to also perform any other type of PA.

The schedule with the different stages in which the study was developed can be seen in Figure 1. Between the first and seventh week of the study, the PA performed and the PIL test in the confinement period were collected. As of week eight of the study, the de-escalation began in the city of Malaga, and this study covered up to the first two phases, called Phase 0 (from May 4 to 17 in Malaga; Order SND / 388/2020) and Phase 1 (from May 18 to 31 in Malaga; Order SND / 399/2020). Phase 0 corresponds to weeks eight and nine, and Phase 1 corresponds to weeks 10 and 11 of this investigation. However, during each of the weeks, information was collected online about the data mentioned in the following sections.

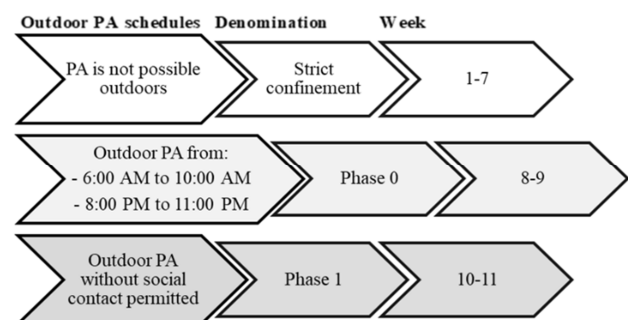


Figure 1. Timeline of the intervention program from week 1 to 11 according to the confinement and de-escalation phases.

Data collection instruments

The information was collected online using the forms of the "google questionnaire" platform. A weekly questionnaire was collected, in which the level of PA performed in the week prior to its application was recorded (number of sessions, type and volume of PA in min / week for groups BAct and Act) and the PIL test (purpose in life). From the levels of PA reported by the participants, they were classified as active (Act), low physical activity (BAct) and sedentary (Sed). The applied PIL test was developed by Crumbaugh and Maholick (1964), based on the existential theory of Viktor Frankl (1905-1997) to assess the level at which an individual experiences the meaning of life. The Spanish version of the test, which has been applied to Spanish university students, was applied (García-Alandete, Martínez, Lozano, & Gallego-Pérez, 2011; Martínez, García-Alandete, Sellés, Bernabé, & Soucase, 2012; Noblejas, 1994). For the interpretation of the PIL test, the value of each item was added to calculate the total score of the test; the higher the score, the greater the sense of life the person experiences. Reliability was evaluated with the Cronbach α .

Statistical analysis

The distribution of the data was evaluated, the mean values (M), the standard deviations (SD), the medians (Mdn), the coefficients of variation (CV) and the correlation coefficients by Spearman ranks (rs) were calculated for the set of variables. Statistical tests for repeated measures were applied, in particular the Friedman test (χ^2

and the Wilcoxon test (Z statistic), and tests for independent samples, such as the Kruskal-Wallis (H statistic) and Mann-Whitney (statistic U); for post hoc tests, the Bonferroni correction was applied. The significance level used in all tests was $p = .05$. All calculations were performed using the SPSS 25 and Statgraphics Centurion programs for Windows.

Results

In Figure 2 a decrease in the level of PA is observed when the confinement situation begins (week one to week two), then in week nine the highest average value was obtained, observing a slight tendency to decrease until week 11. The significance test for the comparison of PA levels at weeks one, two, five and 10 indicated statistically significant differences ($\chi^2 = 26.69, p < .001, N = 170$). In post hoc tests it was found that there are significant differences in the level of PA between weeks one (Mdn1 = 235) and two (Mdn2 = 180, $Z = -3.18, p < .0083$), as well as between weeks five (Mdn5 = 200) and 10 (Mdn10 = 250, $Z = -3.84, p < .0083$), but the same between weeks 1 and 10 ($Z = -1.29, p = .198$). From this it can be deduced that once the confinement began, there was a significant decrease in PA, but as traffic restrictions decreased, the level of PA reached values similar to those obtained in week one. When plotting the level of activity by participant type during the 11 weeks of the study (see Figure 3), it is observed that the Act group showed little variability, unlike the BAct and Sed groups.

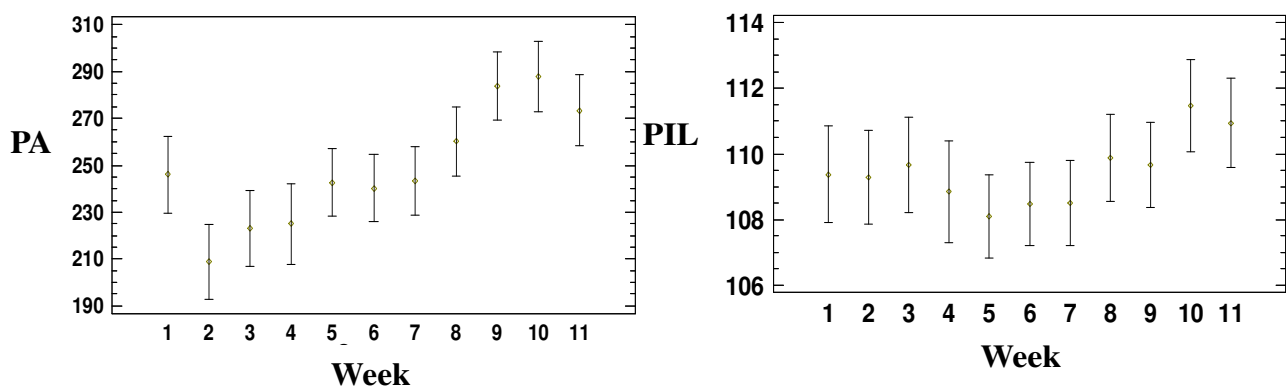


Figure 2. PA (min / week) reported by the participants and means of the PIL test. The vertical lines show the 95% confidence interval

The Cronbach's alpha obtained for the PIL test was .945 and the interval of mean values and standard deviation obtained for the test was between 108.1 (16.7) (week five) and 110.8 (17.0) (week 10, see Figure 2). Taking gender and type of participant (Act, BAct and Sed) as classification variables, no statistically significant differences were found in the PIL test score for the different groups ($p > .05$). Additionally, while the Act group shows PIL test values that converge towards a strong purpose and meaning of life (values above 114), the BAct and Sed groups have PIL test values that tend towards an existential void (Values below 95, see Figure 4). In Figure 5 it is observed that the line of the PIL test that denotes lack of

meaning and purpose in life increases steadily from week one to week six, and from week seven to 11, it begins to decrease, coinciding with the lifting of some confinement restrictions in Malaga and in the rest of Spain.

The linear correlation analysis between PA and the PIL test values showed a weak degree of correlation, with values of the correlation coefficient between .10-.39 (Schober, Boer, & Schwarte, 2018). The correlation was positive and significant ($p < .05$) for all weeks. For example, for week 10, the PIL correlation ($r_s = .240; p = .003; N = 232$) showed an association between PA and the meaning of life of the students.

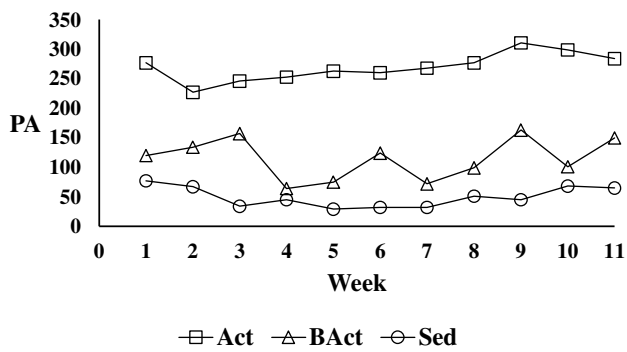


Figure 3. Variation of PA (min / week) by week and type of participant

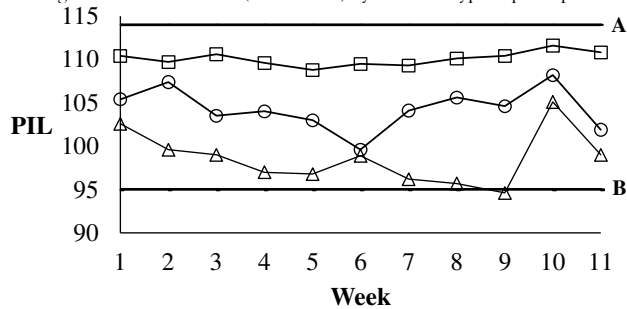


Figure 4. Variation of PIL test scores by week and type of participant (A = 114; B = 95)

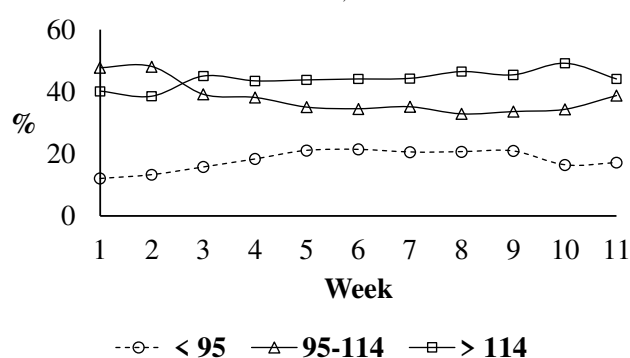


Figure 5. Distribution of the values of the PIL test (in%) in the variables the lines: lack of meaning (<95); zone of indefiniteness (95-114), and zone of strong meaning or purpose of life (> 114), for the 11 weeks of follow-up.

Discussion

PA in confinement

Incidental PA is an important component of a healthy lifestyle, since it takes into account all the unplanned and intentional exercise that involves energy consumption by the person (Koch et al., 2020; Sanchez-Lopez et al., 2018; Strath et al., 2013). In the results, little variability was observed in PA levels (weeks 3-7) in the evaluated group, which can be attributed to the situation of compulsory confinement and physical withdrawal, which restricted people to carry out PA outside their homes, activities such as jogging, walking, walking your pet or, riding a bicycle, and other daily ambulatory activities such as going to study centers, going up and down stairs. Instead, now they could only practice PA in the physical spaces available in the family home or place of confinement, which they had (garden, patios, terrace, living room, rooms, etc.). This change in PA levels was corroborated by the significant decrease in PA between weeks one and two. The transfer

to study centers, going up and down stairs, and going to classrooms, are PA that university students no longer did as a result of the suspension of face-to-face academic activities. As shown in Figure 2, the significant increase observed in PA levels in weeks nine and ten can be attributed to Phase 1 de-escalation of the confinement situation in which the population was, since, being more informed on the pandemic and biosafety measures, and the decrease in restrictions on mobility, they were able to feel more confident and perform more PA outside the home; the equality found in the levels of PA between weeks 1 and 10, indicate a return to certain activities before confinement. The range of mean PA values (min / week) was between 209-288 and the median range was between 180-150, which indicates that in general, the sample of students complies with the WHO recommendations to perform at minus 150 min / week of moderate intensity PA (World Health Organization, 2010).

This decrease in PA during the pandemic has been reported in different investigations. In that sense, Martínez-de-Quel, Suárez-Iglesias, López-Flores, and Pérez, (2021) found in a sample of Spaniards a decrease in PA and perceived well-being, coupled with an increase in sleep problems. In Mexico, Zamarripa et al. (2021) detected in a sample of participants, a decrease in PA, when compared before and during confinement. In a sample of Canadians, Lesser and Nienhuis (2020) found that the effect of confinement on the general well-being depends on the level of PA that the person has, being the most affected the least active. This makes it necessary to promote PA within the home as a means to promote the physical and mental health of participants.

The intervention program (Move At Home) applied to the group of participants may have influenced the decrease in PA to be less pronounced, and then increase in a sustained manner until weeks five and six; then in the following weeks, when the conditions of confinement are relaxed, PA returns to the values initially evaluated. It could be indicated that the "Move at home" intervention program could serve as a catalyst for the maintenance of PA in periods of confinement, since most studies express an increase in sedentary habits among university students in this situation (Gallo et al., 2020; Maher et al., 2021; Rutkowska et al., 2021). In a 12-week intervention work during the pandemic, where a YouTube video was used remotely to direct PA of young adults, it was found that both sleep quality and the level of median to vigorous PA significantly improved at the end of the study (McDonough, Helgeson, Liu, & Gao, 2022), suggesting that this type of interventions may be beneficial to serve groups of people in confinement conditions.

PIL Test

Cronbach's alpha obtained for the PIL test (.945) is comparable to that obtained by Armas, López-Castedo and Sánchez (2018) of .90 and by Noblejas (2011) of .898, which indicates that the PIL test is reliable. On the other

hand, the mean values of the PIL test obtained are within the values reported for the Spanish population of the PIL test, according to the works of García-Alandete, Martínez, Lozano and Gallego-Pérez (2011) of [109.2] (weighted average calculated from the data in Table 1, page 685); by García-Alandete, Gallego-Pérez & Pérez-Delgado (2009) of $M = 109.08$, $SD = 14.41$; and by Noblejas (2011) with an average for the entire sample of $M = 108.07$, $SD = 15.117$ and for those under 30 years of $M = 109.96$, $SD = 11.275$. The range of average values obtained for the PIL test (108.1-110.8) places the sample within the undefined zone, which is associated with the average age of the sample, since in different studies it has been found that older people have higher PIL test scores than young people. This trend between age and PIL test scores was reported by Gottfried (2016) who, in the case of Argentina, found that the group aged 21-30 had an average $M = 107.8$, $SD = 16.4$ and for the group 31- 60 years an average of $M = 112.9$, $SD = 16.3$.

Purpose in life and PA during confinement

The purpose and meaning in life are not only an important factor in people's psychological well-being (Ryff & Keyes, 1995), but it can also predict it (García-Alandete, 2015) and can be the basis for an emotional state healthy during the current situation caused by the COVID-19 pandemic (Arslan et al., 2022; Schnell & Krampe, 2020). In this work, the values obtained for the PIL test under confinement conditions were consistent with those obtained for the test in groups of university students previously reported (García-Alandete et al., 2011; Noblejas, 2011), however, a differential behavior was found with respect to the weeks of confinement and the levels of PA. The increase in the percentage of people with existential emptiness from 11.8% in week one, to 21.6% in week five, may be an indication of an increase in depression (Kleffaras & Psarra, 2012) or hopelessness (Gallego-Pérez & García-Alandete, 2004), with which the meaning of life is inversely related. Increases in levels of stress, anxiety and depression are the main mental disorders reported in the confinement situation due to the COVID-19 pandemic (Maher et al., 2021; Ugbolue et al., 2020). In this research, the most affected group was the physically less active, whose PIL test values converge towards the existential void zone, which can be explained, since they do not enjoy the protective effect of PA on mental states associated with anxiety, stress and depression (De Mello et al., 2013; Mammen & Faulkner, 2013; Rebar et al., 2015). This result is in agreement with that reported by Faulkner et al. (2021), who found that in a sample of people from the United Kingdom, New Zealand, Ireland, and Australia ($N = 8,425$; 44.5 years, $SD = 14.8$) who had a negative change in PA level had worse mental health indicators than people who had no change or a positive change.

In contrast, the physically active group had a more stable behavior and with PIL test values that converge to-

wards the zone of full achievement of the meaning of life. This finding could be attributed to the positive relationship between general well-being, happiness and PA (McMahon et al., 2017; Zhang & Chen, 2019), reported by other works in the context of the pandemic. In this sense, in the systematic review carried out by Wolf et al. (2021) it was found that performing PA during the Covid-19 pandemic, is associated with less depression and anxiety. This was also reported by Ai, Yang, Lin and Wan (2021) who indicated that the exercises performed during the pandemic reduced anxiety, depression and discomfort of people. An additional benefit of PA protection to people's overall well-being is that healthy lifestyles including regular exercise decrease the likelihood of complications from Covid-19 disease (Siopis, 2021).

The positive and significant correlation found between the scores of the PIL test and the PA (min / week) reported by the respondents can be explained, since when the person has a strong sense and purpose of life, they have one of the main factors of well-being psychological, and consequently, you will take action in favor of your physical and mental well-being. This correlation has been reported in other works, such as Hooker & Masters (2014) and Holahan and Susuki (2006). In this sense, Hooker and Masters (2014) found a positive association between life purpose and PA objectively measured with accelerometer (PA of moderate to vigorous intensity) and PA subjectively reported by a group of 104 women ($M = 34$ years, $SD = 15$ years). Holahan and Suzuki (2006) found a positive association between life purpose and regular PA in a group of 162 elderly ($M = 86$ years, $SD = 4$ years). However, in Brazil, Oliveira et al. (2019) did not find a significant correlation ($r = -.13$) between life purpose and PA estimated through daily walks (in min / day). The results of this study confirm the hypothesis that in general, people who have clear objectives, goals to achieve and have a strong sense of life, have greater longevity, are healthier and happier (Czekierda, Banik, Park, & Luszczynska, 2017; Routledge & FioRito, 2020), and they are more physically active. This hypothesis is also supported by the trend found, where the Act group obtains the highest scores from the PIL test, when compared with the BAct and Sed groups, reaffirming what is suggested by different researchers that indicate that PA not only improves all the indicators health, but also the emotional and mental state of an individual (Donnelly et al., 2016; Warburton & Bredin, 2017).

Conclusions

This work focused on establishing the purpose and meaning of life and its relationship with PA, in a group of university students during confinement in Spain. As established in the bibliographic review and in the results of this research, a strong sense and purpose in life is an important factor to take into account, to maintain mental health and to be able to adequately manage the possible problems

caused by the pandemic. of COVID-19, in order to maintain the physical and emotional well-being of the general population, and especially among the population group that has remained long periods in mandatory confinement. From this point of view, the promotion of regular PA should be part of any public policy for the management of this crisis (Bello, Flores, Salvador, & Giakoni, 2022; Martínez-Rodríguez et al., 2021), not only for the maintenance of body health and improve the functioning of the organism, but also to maintain the mental and emotional balance of individuals in confined contexts. In addition, the intervention program developed with students per week could help maintain the level of AF in participants.

Although with the available data, it was not possible to establish a causal relationship between meaning and purpose in life with PA in contexts of pandemic and confinement, a significant correlation was found between them, so the implementation of policies would be necessary promotion of PA in confinement stages to modulate the emotional state of individuals. In our opinion, future research would be necessary to better understand this relationship, with the aim of improving the psycho-emotional state of people in similar situations of Pandemic or confinement.

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