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Effect of the Affective and Cognitive Benefits of Exercise in Instagram on Users' Physical Activity

Saeed Yousefi[1] | **Fatemeh Abdavi**[2] | **Yaghoob Badriazarin**[3] | **Maryam Moghadam Salimi**[4]

1. Ph.D. Student of Sport Sciences, Tabriz University, Tabriz, Iran. Email: saeed_yuosefi@yahoo.com
2. Corresponding author, Assistant Professor of Sport Sciences, Tabriz University, Tabriz, Iran. Email: fatemehabdavi@yahoo.com
3. Associate Professor of Sport Sciences, Tabriz University, Tabriz, Iran. Email: badriazarin@gmail.com
4. Assistant Professor of Cognitive Sciences, Tabriz University, Tabriz, Iran. Email: moghadamm@tbzmed.ac.ir

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ABSTRACT

The present research examined the effects of the affective and cognitive benefits of exercise in Instagram on users' physical activity through two consecutive studies. The results of the first study showed that the designed content provided sufficient cognitive and affective benefits. Similarly, the second study found that after adjusting the basic PA level, the affective and cognitive groups had more PA than the control group, and the cognitive group had more than the control group. Consecutively, 45.75% of subjects who were inactive were turned into active after one week of being taught of the benefits of exercise, with 71.43% in the affective group and 28.57% in the cognitive group. In terms of gender, 84.12% were women and 15.78% were men. As a result, visual exposure to sports participation might have led to an increase in positive feelings among users, especially women, which may have led to increased PA levels. The results of this study are useful for health professionals who are trying to communicate information about the benefits of exercise to their target audience based on a combination of evidence, gender, and PA level.

Introduction

According to recent research (Williamson et al., 2021), there is a global trend of inactivity in many high- and low-income countries. The global increase in non-communicable diseases such as cancer, cardiovascular diseases, depression, and diabetes is linked to inactivity and inadequate physical activity. Meanwhile, physical activity (PA) is widely recognized as an effective method for both physical and mental health, reducing disease risks and premature mortality (World Health Organization, 2019); PA also increases the benefits of participation, promoting overall health and well-being (Hevel et al., 2019). It is therefore essential to find effective ways to encourage people to

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be active, especially as global PA rates decline (World Health Organization, 2019). Moreover, a systemic approach also recognizes the importance of modifying policies and the physical environment in order to promote PA (Milton et al., 2020), as well as social norms, perceptions, and awareness of the benefits of PA. As a result, PA messaging is a strategy that may target individual and social factors. In PA messaging interventions, information is provided to members of the general public in order to improve their PA levels directly or indirectly (Williamson et al., 2021). This is a method for designing motivational and persuasive messages that stimulate engagement in desirable behaviors (Rothman & Updegraff, 2010). The nature of PA messages is complex and multifaceted, and it is necessary to consider a number of concepts when creating or evaluating multimedia messages (Williamson et al., 2021). Previous research has examined variables to identify how PA messages affect audiences. In the field of modeling PA messages, most researchers have compared gain and less formats (for example, exercise increases muscle mass and inactivity decreases muscle mass). In most of the literature, the gain design has been found to be more effective because of the functional activity of the preventive approach (Morris et al., 2016; Lithopoulos et al., 2015). According to Emerson et al. (2022), daily changes in instrumental and affective attitudes toward exercise may influence daily decisions for exercise. The effectiveness of PA messaging can also be discovered by identifying the message's affective and cognitive content (Hevel et al., 2019). Affective messaging focuses on improving mood and energy, while cognitive messaging emphasizes physical health benefits such as increasing cardiovascular fitness or losing weight (Hevel et al., 2019). In this context, Sirriyeh et al. (2015), in investigating the effect of the message on the level of PA of adolescents, found that inactive participants who received affective messages increased their PA significantly more than those who received utilitarian messages and those who received the combined group. Meanwhile, Hevel et al. (2019) found that messages that promote affective benefits increase participation intentions and likelihood for active participants, while messages that promote physical health benefits increase participation intentions and likelihood for inactive participants. As Morris et al. (2016) demonstrated, short-term affective messages were the message that elicited the highest levels of self-reported physical activity at follow-up, and they provided a useful way to distinguish between health messages focusing on affective benefits and other messages. The study by Connor et al. (2011) showed that affective messages (such as vitality and cheerfulness) are more likely to alter attitudes and behaviors related to sports than utilitarian messages (such as vital signs). In addition, Lawton et al. (2009) showed that affective attitudes are stronger predictors of PA than cognitive attitudes (Like physical health).

PA messaging also considers image content versus text content. Health interventions and public service announcements commonly use persuasive images to promote healthy behaviors (Cameron & Chan, 2008). The use of visual images in conjunction with text messages should create realistic sensory experiences that trigger mental imagery of the potential consequences of health decisions (Niw et al., 2020). The use of visual images has also been observed to enhance effectiveness and highlight health decision-making processes (Zillmann, 1999). In this way, health information presented alongside images is associated with greater understanding and attention, message recall, affective reactions, and risk perception (quoted by Niu et al., 2020). Moreover, messages with images are easier to understand and generate more social comparisons than those without images, and social comparisons can influence attitudes and motivation in people (Johantson & Davis, 2019). Consequently, based on the above results, visual messages about the consequences of sports participation are more likely to be effective in promoting physical activity than verbal messages. To convey the message of physical activities to the target audience, it is important to pay attention both to the format as well as the content and type of image or text. Social media, on the one hand, has a significant impact on people's thoughts, feelings, and behaviors due to its accessibility and popularity (Vogel et al., 2014), and social theories of influence support this view. Additionally, they provide social benefits (Centola, 2013). Fitness and PA are popular topics on many social media channels. The worldwide outbreak of COVID-19 has made this apparent, since clubs and parks have been closed, and digital and social media content about sports has gained popularity during the pandemic (quoted by Durau et al., 2022). The COVID-19 epidemic has highlighted the key role of social networks in spreading health messages, so in critical situations, emergencies, and disasters, as during the COVID-19 health crisis, social networks can be very helpful. Social media has also been identified

as a powerful tool for reaching and targeting a wide audience in the World Health Organization's 2020 Global Action Plan for PA (World Health Organization, 2019). Therefore, based on the features of social media mentioned above, it is among the most effective communication methods to inform people about physical activities.

A systematic change has occurred in social networks from text-based to image-based and video-based communication (Goodyear et al., 2021). These changes give Instagram a competitive advantage, unlike Facebook or Twitter, where text content is the primary type of content (Song et al., 2018). In recent years, Instagram has become one of the fastest-growing social networks due to its visual appeal (Raggatt et al., 2018; Tricás-Vidal et al., 2020). Its popularity has increased significantly, producing a lot of content and increasing user interaction (Song et al., 2018). In this regard, Instagram is an effective platform for including visual cues in text messages that convey the benefits of physical activity along with text. Raggatt et al. (2018), discuss how the content of influencers affects the health beliefs and behavior of users, four key issues: (1) setting a healthy ideal, (2) not achieving the ideal, (2) being a part of society, and (4) access to reliable information. In a study aiming to encourage PA by Instagram fitness influencers, Tricás-Vidal et al. (2020) found that US residents who felt encouraged to do PA by Instagram fitness influencers achieved the World Health Organization's recommendations for moderate physical activity. In contrast to the previous research, Gilibert et al. (2021) found no significant effect of mental health messages with profit-and-loss frames in social media on the PA of students.

While Instagram has shown potential as an effective visual communication tool to promote physical activities, concerns have also been raised about unfavorable content and a lack of variety in information (Fung et al., 2020). A study conducted by Hendry and colleagues (2022) showed that social media influencers often post images of health-related content on Instagram that show a superficial lifestyle and values that overwhelm young people. Raggatt et al. (2018) also found that achieving an ideal appearance, based on images of influencers, is equivalent to achieving optimal health, fitness, and strength. As a result, patients may feel inadequate or fail to achieve their goals, as well as psychological distress and the risk of developing eating disorders or compulsive sports behavior. In addition, studies have found that short-term exposure to fitness images can increase positive moods among female undergraduate students and increase short-term body dissatisfaction (Raghgatt et al., 2018). Consequently, while the Instagram social network has been shown to have positive effects in the field of sports, research has also revealed its potential risks. Due to the rapid growth of social media users and content production in physical activities, there is currently no guidance for policymakers, professionals, or organizations on how to use social media responsibly.

Despite all researches that have studied fitness content and Instagram influencers in this field, linking exposure to sports content with physical activity status, the puzzle is still incomplete and several pieces of information about how affective and cognitive content in Instagram affects the PA of users seem to be missing. To address this issue, we conducted two studies: at the first study, we studied the degree of affective and cognitive understanding of Instagram posts that addressed the benefits of sports on affective and cognitive levels; second, the affective and cognitive consequences of exercise have been measured by the level of activity among Instagram users.

Methodology

Two studies were conducted in the present study. In the first study, Instagram posts with content on sports' affective and cognitive benefits were designed, and the degree of affective and cognitive understanding of the content was determined; In the second study, the effect of exercise on affective and cognitive outcomes has been measured in the context of Instagram by comparing the activity levels of active and inactive users, as explained in the following sections of each study.

The First study: Design of Test Message Content

The purpose of the first study was to determine the affective and cognitive consequences of exercise in Instagram content. The purpose of the first study was to determine the cognitive and affective benefits of sports in the content of the Instagram social network. In order to accomplish this, images and text were examined separately in terms of affective and cognitive content. Following this

determination, Instagram social network content with affective and cognitive effects related to sports was designed. In the next part, the affective and cognitive consequences of exercise are fully explained after several evaluations have been performed once again after designing the content.

Researchers have found that regular physical activity, of medium and high intensity, has cognitive health benefits such as weight control, reduced obesity risk, reduced heart disease risk, and helping to create and maintain healthy bones, muscles, and joints, as well as effective health benefits like increasing endorphin levels, which can help reduce anxiety and stress (Morris et al., 2016). In the subtitles, we divided the content into cognitive (e.g., PA can help you maintain a healthy appearance, PA can strengthen your muscles, etc.) and affective (e.g., PA can make you feel happy, PA can make you self-confident). These categorizations were chosen based on research (Sirriyeh et al., 2015; Hevel et al., 2019). Due to the preventive nature of physical activities, all messages are designed in an gain way (Morris et al., 2016). The length of all subtitles (number of words) was between 8 and 12 words, according to previous research. These word counts are both long enough to be noticed and short enough to fit without scrolling down or requiring too much cognitive effort (Tiggemann et al., 2020). A validity test was also conducted by experts to determine the accuracy of the messages in terms of vocabulary, clarity, and level of reading difficulty (Chang & Choi, 2014). To design the Instagram social network content, we chose sports images with cognitive and affective implications. In order to increase internal validity, several tests were conducted at different stages, as there was no standard tool for evaluating images with affective and cognitive consequences. In the first stage, in order to provide suitable coverage of images, 400 images were taken from social media according to the objectives of the research, as in previous research (Johanston & Davis, 2019), in order to increase the external validity of the research (Reifegerste & Rossmann, 2017). A five-point Likert scale of 1 very low to 5 very high was used to assess whether the affective or cognitive consequences of sports are mentioned in sports images, as well as explain the affective and cognitive consequences of sports participation. The total number of images was evaluated by students and experts on the advisory board using a five-point Likert scale (from 1: very low to 5: very high). After collecting the opinions, the pictures that were mentioned in the item "This picture mentions the affective benefits of sports participation" were ranked fourth and fifth as affective pictures, and the pictures that were mentioned in the item "This picture mentions the physical benefits of sports participation" were ranked four and five and were classified as cognitive images. According to the advisory board, the images that had ranks four and five in two subjects at the same time, that is, had the affective and physical benefits of sports participation in their content, were removed. To create content for Instagram that reflects the affective and cognitive consequences of sports participation, affective and cognitive images with text messages were designed as the next step.

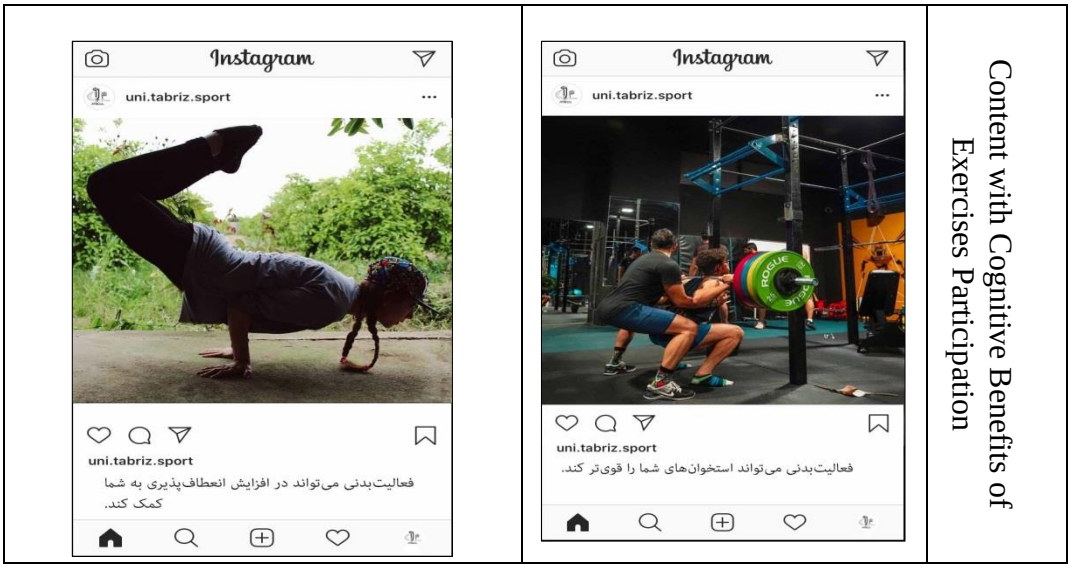

Figure 1. Examples of designed messages on Instagram

As a final step, Instagram's social network was used to design images with text messages, and we were able to conclude using these methods that the combination of affective images and affective text messages in their content refers to the affective consequences of sports participation, whereas cognitive images with more text messages refer to the cognitive consequences. Finally, for each affective and cognitive condition, 14 posts were selected that separately emphasized the affective and cognitive consequences of sports participation in their content. Based on three five-point Likert scales, 80 people (10 people for each condition) from the target age group were assessed on their perception of the cognitive power and affectivity of the content. A Mann-Whitney U test indicates (as a result of the order in which answers were provided) a significant difference exists between the affective and cognitive conditions of the study in the second item that measured cognitive power (Chi-square = 46.35, significance = 0.001), while a significant difference is found in the third item that measured affective strength (Chi-square = 53.12, significance = 0.001). According to our design, cognitive and affective content has the power to show the affective and cognitive consequences of sports participation. Finally, based on the results of the first study, it appears that the designed posts are suitable for every condition, so if, in the second study, there is a significant difference between the conditions in terms of sports activities variables, it may be due to the observation of the affective and cognitive consequences of sports on Instagram.

The second study: Intervention Test

General purpose: The purpose of the second study is to determine the effect of the intervention of the affective and cognitive consequences of sports participation in the context of the Instagram social network on the interest in membership in Instagram sports pages (after manipulation) and the amount of self-reported physical activities (before and after manipulation), among inactive students.

Experimental Design: The present research has measured the effect of the affective and cognitive benefits of sports participation on Instagram online using a three-group quasi-experimental experimental design.

Participants: Students at Tabriz University were the participants of the present study. The students were accessed through the educational channels created among them, and requests for participation were sent after the arrangements had been made for them by the educational channels. Students received a link containing an announcement of readiness to participate in an online sports intervention. 709 people completed this link, and 454 people visited the link one week after the intervention; However, due to the incompleteness of the data, only 205 people were used for analysis (155 women, 55 men, average age 22.51±2.41 years, 82 participants in the intervention group of affective consequences of sports participation, 63 participants in the observation group of cognitive consequences of sports participation, and 60 participants in the control group) whose data were analyzed. The number of subjects in each condition was similar to that of multimedia studies, which

have reported an average of 30 to 60 participants (Davies et al, 2020). Additionally, the participants provided informed consent after being informed about the manipulation process, and the research protocol was also approved by the Tabriz University ethics committee (code: 1399.036).

Measurement of dependent variables: The Godin and Shafer's questionnaire was used to measure PA (Godin and Shephard, 1985). Participants are asked to report the amount and duration of activity they have engaged in in the last week based on three intensities of activity (mild, moderate, and high intensity). The participants completed the leisure time PA questionnaire before and one week after the intervention (receiving the results of sports participation). Scores less than 24 are considered active, and scores greater than or equal to 24 are considered inactive. Like Lithopoulos et al. (2015), participants in the study completed questionnaires regarding their interest in joining the Instagram sports pages before and after the intervention.

Process: Data were collected using online expressions in this quasi-experimental study. The online links were randomly distributed among the three teaching channels created by Tabriz University after the tools from the previous research were prepared. Students voluntarily participated in the study and completed a consent form after getting acquainted with the study's nature and purpose in the first stage. During the next stage, students were screened for variable items (current health) as well as variable items related to their interest in joining Instagram sports pages during their free time. We then randomly selected and categorized classrooms that would receive content with affective, cognitive, and control benefits. After completing the baseline period, the participants in the three groups were exposed to the interventions related to affective, cognitive and control benefits through educational channels separately for one week and two messages per day, so that the probability of being seen by the participants would be maximized (Gilbert et al., 2021). Students completed a follow-up link (questionnaire of sports activities during free time and interest) after receiving and seeing the affective and cognitive benefits of sports participation on Instagram. The participants were also asked to rate each link on a five-point Likert scale, which was used to test whether they received and paid enough attention to the links sent in the present study. As a part of Lithopoulos et al., (2015), the participants who were unable to write down two of the posts about cognitive and affective benefits of sports participation in the follow-up phase were excluded from further research to assess the recall of sports posts.

Statistical analysis

The main goal of the analysis was to determine the effects of observing the affective and cognitive consequences of sports participation in the context of the Instagram social network in three groups, focused on the amount of sports activities and interest. To ensure the normality of the data distribution, the results of the Kolmogorov-Smirnov test indicated that this assumption was met. Also, to find out the effects of receiving the content of the affective and cognitive consequences of sports participation for the amount of PA and interest from ANCOVA and correlated T test, to find out the difference between demographic variables from ANOVA and Chi-2 test, Pearson's correlation coefficient was used for the relationship between PA and interest. The analysis were performed using SPSS version 26 statistical software at a significant level (α=0.05). Also, the effect size (Cohen) has been reported, along with the main effects, as a measure of the amount (magnitude) of these effects.

Results

The findings are presented in two parts: the demographic variables of the participants and the results of the paired t-test of the dependent variables of the research groups.

Table 1. Demographic characteristics of the participants

Characteristic	Total (n=205)	Affective (n=82)	Cognitive (n=63)	Control (n=60)	Sig.
Age m (s.d)	21.52 (2.41)	22.04(3.48)	21.57(2.07)	21.01(1.04)	0.61
Gender					
Man f (P %)	50 (24.4)	13 (6.3)	12 (5.9)	25 (12.2)	0.01
Female f (P %)	155 (75.6)	69(24.9)	51 (24.9)	35 (17.1)	
Using SN m (s.d)	93.21 (37.430	90.48 (38.93)	100.3 (34.02)	89.50 (38.33)	0.19

The information obtained from Table 1 shows the demographic characteristics of age (21.52 ± 2.41) and the amount of use of Instagram during the day (93.21 ± 37.43), the participants in the research are divided into groups. According to the significance level, the results obtained from the ANOVA test indicate that there is no significant difference between the groups in terms of age and the amount of use of Instagram during the day. Also, in terms of gender, 24.4% of 50 people were men and 155 people were 75.6% of women which was intended in subsequent inferential analyses.

Table 2. Descriptive statistics and paired t test results for dependent variables

characteristic	Time	Affective	Cognitive	Control
PA m (s.d)	Baseline	15.24 (5.08)	14.36 (5.36)	14.76 (4.97)
	Follow Up	24.08 (5.15)	20.60 (5.10)	14.66 (5.57)
	Changes	- 8.84 (5.70) **	- 6.23 (6.13) **	0.10 (5.10)
Interest m (s.d)	Baseline	3.53 (1.21)	3.54 (1.28)	3.23 (1.22)
	Follow Up	4.04 (0.87)	3.58 (1.27)	3.21 (1.18)
	Changes	- 0.51 (1.22) **	- 0.04 (0.88)	- 0.01 (0.83)

The information obtained from Table 2 shows the descriptive statistics of the changes in the amount of physical activities and interest in receiving sports content in the social network Instagram during the baseline and follow-up periods. Also, as the data obtained from the correlated t-test shows, the difference between the baseline and follow-up times in the variable of physical activities in the groups of content of affective consequences (P=001) and content of beneficial consequences (P=001) is significant. But this difference was not significant in the control group. Also, in the variable of interest in receiving sports content on the platform of Instagram, it is significant in the content groups of affective consequences (P=001), but this difference was not significant in the groups with the content of beneficial consequences of sports and control. ANOVA statistical test was used to compare the amount of physical activities among the affective, beneficial and control groups, taking into account the baseline and follow-up times. In order to use this test, the assumptions of data distribution, equality of variances, and the interaction effect of the factor variable and the intervening variable (group * dependent variable), for both dependent variables, the amount of physical activities and interest in receiving sports content on the platform of the Instagram social network, have been investigated. It should also be mentioned that the dependent variables were not investigated and included in the final analysis. The results showed that the index of physical activities (PE=0.39 and P=0.001, F=64.96) and there is a significant difference in the interest in receiving sports content on the Instagram social network platform (PE=0.10 and P=0.001, F=11.12) among the groups with the basic time variable. Bonferroni post hoc test was used for pairwise comparison of groups (Table 3). Also, Pearson's correlation test was used to investigate the relationship between the amount of PA and the interest in being a member of sports pages on Instagram, and the results indicated that there was a significant relationship only among women in the affective group (R =0.003, P=0.34).

Table 3. Bonferroni test results for dependent variables

	(I) Message	(J) Message	MD (I-J)	Sig.	95% CI	
					LB	UB
PA	Affective	Cognitive	3.12*	0.001	1.54	4.71
		Control	9.22*	0.001	7.62	10.83
	Cognitive	Control	6.09*	0.001	4.39	7.80
Interest	Affective	Cognitive	-0.46*	0.002	-0.749	-0.178
		Control	0.20	0.200	-0.108	0.510
	Cognitive	Control	-0.20	0.200	-0.510	0.108

As the data from Table 3 shows, in the follow-up test in PA between affective and cognitive groups (CI=1.18 to 5.06 and P=0.001, M=3.12), Affective with control (CI = 7.26 to 11.19 and P = 0.001, M = 9.22) and cognition with the control (CI=4.02 to 8.18 and P=0.001, M=6.10), considering the amount of PA as a covariate, there is a significant difference. Also, in the variable of interest in receiving sports content in the Instagram social network between affective and cognitive groups (CI=0.12 to 0.81 and P=0.005, M=0.46), there is a significant difference between affective and control (CI=0.30 to 1.02 and P=0.001, M=0.66), taking into account the amount of PA as a covariate. This pattern is shown in Figure 2, which shows the greatest increase in physical activities and interest in receiving sports content on the Instagram platform to follow content with affective consequences of sports participation.

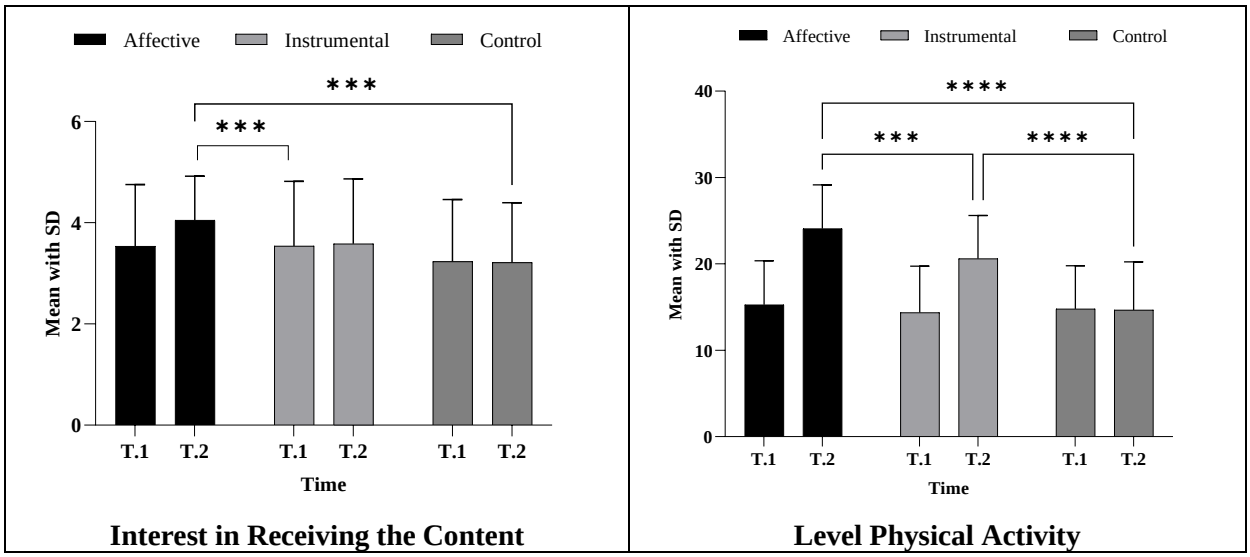

Figure 2. Bonferroni test results for dependent variables

Table 3. Frequency of participants from baseline to follow-up in PA

characteristic	Time	Affective	Cognitive	Control
Sedentary	Baseline	31 (39.7)	24 (38.1)	23 (29.5)
	Follow Up	1 (2.4)	10 (24.4)	30 (73.2)
	Changes	- 30	- 14	7
Moderately Active	Baseline	51 (40.2)	39 (30.7)	37 (29.1)
	Follow Up	36 (37.5)	35 (36.5)	25 (26)
	Changes	-25	-4	-12
Active	Baseline	-	-	-
	Follow Up	45 (66.20)	18 (26.5)	5 (7.4)
	Changes	45	18	5

As the information obtained from Table 4 shows, according to the score of the amount of physical activities, the participants are classified into three categories: inactive (score less than 14), moderate PA (score between 15 and 23) and active (score higher than 24). According to the results, in the affective group, the number of inactive people decreased by 30 people, the number of active people decreased by 25 people, and the number of active people increased by 45 people. In the cognitive group, the number of inactive people decreased by 14 people. The average number of active people decreased by 4 people and the number of active people increased by 18 people and in the control group the number of inactive people increased by 7 people, the average number of active people decreased by 12 people and the number of active people increased by 5 people. According to the results, most of the people who have decreased from the activity range lower than 14 points and reached the activity range higher than 24 points were in the content group with affective consequences of sports participation. This pattern is shown in Figure 3.

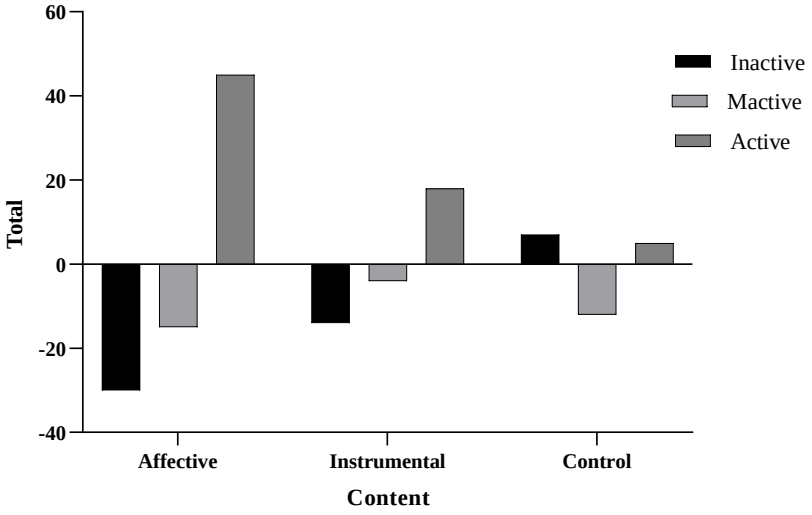

Figure 3. Frequency of participants from baseline to follow-up in PA

Discussion and Conclusion

It is well known that inactivity and inadequate physical activity are major causes of adult mortality worldwide and contribute to the global burden of non-communicable diseases. Furthermore, PA has been shown to reduce the risk of disease and overall premature mortality (World Health Organization, 2019) as well as improve physical and mental health. This is while the global trend of PA is not improving. As part of an effective approach to increasing PA, social and individual factors, including social norms, perceptions, and awareness of the benefits of PA should also be addressed (Williamson et al., 2021). The World Health Organization's global action plan on PA (World Health Organization, 2019) also emphasizes the importance of such approaches. Messaging is one of the advantages of sports participation in the context of social networks, an approach that can target individual and social factors. As a result of social networks providing access to a large number of people at a relatively low cost, spreading the benefits of increasing PA can be an important part of improving PA levels. While the available evidence shows that PA messaging interventions have had limited effects on PA behavior to date (Williamson et al., 2021). Research is therefore needed to determine the most effective content in social networks for the promotion of physical activity as well as improving health policy and performance. Therefore, the present research is divided into two studies with the aim of (1) evaluating whether sports participation on Instagram's visual network platform impacts the PA of inactive users and (2) evaluating the affective and cognitive benefits of participation in sports through Instagram's visual network platform. In order to determine the impact of sports participation on the Instagram visual network platform, we examined the interest in becoming a member of health pages.

In the first study, it was determined whether sports participation in the Instagram social network had affective and cognitive benefits, and in order to do this, image and text content were examined separately in terms of affective and cognitive benefits. After determining the affective and cognitive

nature of the visual and textual content, the Instagram social network content was designed based on the affective and cognitive consequences of sports. Our cognitive and affective content was evaluated several times to ensure a clear understanding of the affective and cognitive consequences of sports. Based on our design, the cognitive and affective content was effective in demonstrating the affective and cognitive consequences of participation in sports.

The second study, using a quasi-experimental design between three groups, examined the effect of a one-week intervention on the affective and cognitive consequences of sports participation on Instagram, which was designed in the first study, on the amount of self-reported physical activities (before and after manipulation) and interest in health pages (before and after manipulation) among inactive online students. Since active people are those who exercise regularly, they are not good targets for PA promotion (Morris et al., 2016). As a result of this, Johansson & Davis (2019) classified people with a PA score less than or equal to 24 as inactive, and those with a score greater than 24 as active. Data from inactive participants was used in the final analysis. A link announcing their readiness to participate in the one-week online intervention of the consequences of sports participation was sent to the students in the first stage. A total of 709 participants completed this link, and 454 people visited it one week after it was posted; however, since the data were incomplete, 205 participants were analyzed (83 people participated in the intervention for affective consequences of sports participation, 63 people participated in the observation for cognitive consequences of sports participation, and 60 people participated in the control group). The participants in the research were in the age range of 22.51±2.41 years, and their use of social networks during the day was 93.21±37.43 minutes. In accordance with the average age and the amount of time spent on social networks, Vaterlaus et al. (2015) report that the 18-25 age group spends the most time on technological devices and social networks can be useful for creating sustainable health behaviors at this age range. Participants in this study were 50 men and 155 women, for a gender ratio of 24.4% to 75.6%. In previous studies (Tricás-Vidal et al., 2020; Goodyear et al., 2021; Raggatt et al., 2018), women were more likely to use social networks than men. A review study by Goodyear et al. (2021) found that most studies of social media interventions on PA targeted young women aged 18-35 who attended universities. Tricás-Vidal et al. (2020) also showed that fitness influencers are mainly women, who spend more time on Instagram to check nutrition or exercise.

According to the ANCOVA analysis of this research, the amount of physical activity was significantly higher in the affective group compared to the cognitive and control groups following a one-week intervention, and these results may be attributed to the one-week intervention that highlighted the benefits of sports participation, because, according to the results of the paired T-test, the number of follow-up physical activities in the control group did not significantly increase; However, there was a significant increase in the number of follow-up physical activities compared to the baseline in the affective and cognitive intervention groups. Also, out of the 45.75% of participants who increased their PA from inactive to active, 71.43% came from the affective consequences intervention group and 28.57% from the cognitive consequences intervention group. These results are consistent with the research of Sirriyeh et al. (2015), who showed that inactive participants increased their PA significantly more than the beneficial group by receiving affective messages for two weeks; Morris et al. (2016) concluded that, controlling for baseline activity levels in the follow-up, the highest levels of self-reported PA were in the group with short-term effective messages, and Conner et al. (2011) showed that affective messages can change sports behaviors more than useful messages. Even Liao et al. (2017), under laboratory conditions, showed that more energetic and less negative feelings during PA are associated with more PA in the future (after 6 and 12 months). These results indicate that the positive affective benefits experienced during physical activities may strengthen future PA behavior. As seen in this research, the participants in the affective group observed the positive energetic feelings experienced by others participating in sports, and they had a higher level of PA. It is possible that this increase in physical activity in this group was due to obtaining these affective benefits, i.e., positive energetic feelings.

Also, the results of the physical activity volume are inconsistent with the research of Hol et al. (2019). These researchers show that, those who were active were significantly more likely to engage in messages promoting affective benefits, while those who were inactive were significantly more likely to engage in messages promoting physical health benefits. There could be several reasons for

inconsistency with this research, including the type of intervention, the statistical sample, and the content of the message, since the above-mentioned study evaluated the effect of physical activity on adults immediately after watching text messages. Unlike Hevel et al. (2019), in this research, the follow-up after one week of receiving the visual content of physical activities was measured on a student, that is, from the young population. Contrary to the results of this study, Gilibert et al. (2021) did not find a significant effect of mental health messages on the PA of students in comparison to the control group. Possible reasons for this disparity include the type of social network identified in the aforementioned research. Gilibert et al. (2021) conducted their study using the Facebook social network, as the most popular type of content on this network. Moreover, the intervention of visual messages in the present study improved cognitive processes related to health, such as improving effectiveness and highlighting health decision-making processes (Zillmann, 1999). As a result of increased understanding and attention, and improved attitudes and intentions (Niu et al., 2020), the intervention group in this study was able to increase their physical activity levels effectively. Therefore, based on the above results, it is possible to conclude that the message regarding the consequences of sports participation in order to promote physical activities, if it is visual, maybe more accessible and creates more information regarding the benefits of sports participation, which leads to the promotion of physical activity. Instagram is therefore an effective way to communicate sports participation's benefits compared to text social networks such as Facebook.

According to the analysis of the amount of physical activities by gender, there was a significant relationship between the amount of physical activity and the interest in becoming a member of Faqz Instagram sports pages among women in the affective group. Accordingly, women were interested in the content of the affective consequences of sports participation, which contained beneficial and affective sports information, and their exposure probably increased women's physical activity. Thus, only 15.78% of men and 84.12% of women had increased their physical activity levels from inactive to active levels. These results are consistent with the research of Tricás-Vidal et al., (2020), who showed that the information sent by fitness influencers encouraged 68.1% of the sample of this study to do PA, of which 82.3% were women. The reason for this disparity in the amount of physical activity between women and men is that most women trust the information sent on social media to be accurate. This is the reason why in our study, women had more PA than men as a result of the intervention of sports benefits on Instagram. Among the other possible reasons for the effect of the affective benefits of sports participation among women are the positive and informative feelings in the content of these messages. In this context, Song et al. (2018) have also stated the reasons for the success of women users on social networking sites, partly due to their greater ability to use positive textual emotions. Therefore, sharing visual and textual content with positive emotions may have a greater impact on users, as in this study, the affective group that received visual and textual content with positive emotions of sports participation had the highest self-reported number of physical activities.

According to these findings, the intervention of the affective consequences of sports participation on the Instagram social network platform involving affective and positive sports information had a greater impact on the number of activities of inactive female participants than the intervention of the cognitive consequences of sports participation. As a result, most content produced on the Instagram platform, especially for Instagram influencers, has been about the benefits of physical fitness and health. As Raggatt et al. (2018) point out, the ideal appearance, as represented by the images of influencers, may evoke feelings of inadequacy or failure to reach client goals. Additionally, it may result in mental distress, eating disorders, or compulsive sports behaviors. Even several other experimental studies have shown that acute exposure to fitness images can increase short-term body dissatisfaction and negative mood among female undergraduate students. Therefore, social media can be a stimulus or an obstacle to PA promotion (Waterloos et al., 2015). So the results of the studies reviewed in this field indicated that exposure to fitness and sports content shared on Instagram social networks has had negative effects on the users, whereas, on the other hand, customers are shown to benefit from the affective benefits of participating in sports, which are associated with positive emotions. According to the results of the laboratory study by Liao et al., (2017), these positive feelings can lead to sports behaviors in the future, especially in female users.

According to the obtained results and previous studies, daily exercise decisions may be influenced by daily changes in affective and instrumental attitudes (Emerson et al., 2020). For this reason, the

messaging of physical activities on social media such as Instagram as a cost-effective source of information (Emerson et al., 2022) and their ability to reach more audiences (Emerson et al., 2022; Durau et al., 2022), with high user interaction (Song et al., 2018), social effects (Centola, 2013), education, and motivation (Goodyear et al., 2021; Durau et al., 2022), can have significant effects on the physical and sports activities of inactive students, which has significant benefits for physical and mental health. (World Health Organization, 2019). As Tricás-Vidal et al. (2022) and Gilbert et al. (2021) have stated, social media can be used to increase students' PA performance. With the spread of Corona epidemic around the world, which has created an obstacle to people's physical activity routines, social media has also been a positive tool for informing people about physical activities. According to Durau et al. (2021), there has been an increased interest in sports content presented through digital and social media; however, if the content produced on these social networks is unsuitable, it can also adversely affect users.

Therefore, the production of visual content on the affective and cognitive benefits of sports participation on Instagram has the potential to reach and target a large audience to promote participation in PA with the content of positive emotions from sports participation and obtaining health through sports participation; However, positive emotions that were displayed in front of physical health had a greater impact on the amount of physical activity of female students who were inactive. Results from the study allow researchers, doctors, policymakers, and health professionals to design and plan evidence-based PA messages and PA levels for their target audiences. Although exposure to the affective and cognitive benefits of sports participation is unlikely to change PA behavior by itself, it can play an important role in a systemic approach to improving people's PA levels.

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