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ORIGINAL ARTICLE

Mass media pressure on psychological and healthy well-being. An explanatory model as a function of physical activity

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Abstract

Objectives The present research aims to identify and establish the relationships between media pressure, psychological well-being, age, physical activity and adherence to the Mediterranean diet. This objective is broken down into (a) developing an explanatory model of media pressure, psychological well-being, age, physical activity and adherence to the Mediterranean diet and (b) testing the structural model by means of a multi-group analysis according to physical activity level.

Material and methods To this end, a quantitative, non-experimental (ex post facto), comparative and cross-sectional study was carried out on a sample of 634 participants (35.18 ± 9.68). The instruments used were an ad hoc questionnaire, the Spanish version of Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4), the Psychological Well-Being Scales (PWBS) and the Prevention with Mediterranean Diet (PREDIMED).

Conclusions The data reveal that meeting the WHO physical activity criteria improves the relationships between media pressure, psychological well-being and healthy well-being.

Keywords Mass media · Physical appearance · Psychological well-being · Mediterranean diet

Introduction

Currently, it has been shown that there is a relevant connection between positive adherence to a healthy lifestyle and both physical and psychological well-being (Cecilia et al. 2018). To achieve total fulfilment in the physical and mental areas, the nutritional, physical-sports, social and evolutionary spheres will condition the development of these domains (García-González and Froment 2017).

In terms of sport, physical activity plays a key role in the development of physical and mental development (Kim et al. 2017). Furthermore, Thomas et al. (2019) point out that the ageing of the population is a key element in the abandonment of physical activity, since as age increases, people opt for other types of activities with a more sedentary character. Given such indications, the World Health Organization (WHO 2020) states that adults aged 18–64 years should engage in 150–300 minutes of moderate aerobic physical activity or intense aerobic physical activity for at least 75–150 minutes per week to maintain a healthy physical state, counting the exercise of any duration (Reyes et al. 2020; Thomas et al. 2019). For the population over 64 years of age, the organisation states that they should strengthen

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the large muscle groups, as well as dedicate three or more days a week to physical activity to improve their balance and prevent falls (Cárdenas-Guaman 2020). In addition, for the population over 64 years of age, the WHO (2020) states that they should also affect multimodal activities and improve their coordination skills.

Likewise, a positive adherence to a healthy dietary pattern also has numerous physical and mental health benefits, such as a reduction in waist circumference, an improvement in blood pressure and an increase in self-concept (Muros et al. 2017). The Mediterranean Diet is conceived as a healthy dietary pattern, not only in terms of food intake but also in terms of the quality and cooking of the food (Melero et al. 2020). The foods that characterise the Mediterranean diet are those originating from the Mediterranean area such as cereals, fruit, vegetables, pulses, olive oil, whole grains and nuts (Melguizo-Ibáñez et al. 2020), accompanied by a balanced consumption of dairy products, oily fish and eggs (Martini 2019). Trigueros et al. (2020a, b) state that during adolescence there is a lack of control in following a healthy dietary pattern, due to the poor nutritional training provided in the educational stages; however, during adulthood there is an adherence to it, due to the numerous benefits it brings to health (González-Valero et al. 2019).

To achieve adequate and full mental and physical development, it is necessary to understand the pressure exerted by different media on the behaviours of the adolescent and adult population towards the creation of different behaviours in different activities (Pippi et al. 2020). The media presents different iconic personalities where they encourage people to commit to a healthy lifestyle, encouraging people to follow healthy lifestyles (Puertas-Molero et al. 2019); however, not all of them have a positive effect. Given such findings (Barcaccia et al. 2017) and (Gietzen et al. 2017) point out that the continuous submission to the media can lead to personal dissatisfaction due to the creation of beauty standards, causing a rejection of their own self-image and thus worsening their own psychological well-being (Puertas-Molero et al. 2019).

During the past decade, there has been a great deal of research on well-being. Ryan and Deci (2001) proposed two main ways to understand this state, hedonics, which relates primarily to happiness, and eudaimonia, which is associated with human potential. In response to this proposal, Keyes et al. (2002) have extended the boundaries of this classification by using the subjective well-being construct as the main representative of the hedonic view and the psychological well-being construct as the representative of the eudamonic view. Focusing attention on the latter perspective, (Anglim et al. 2020) argues that psychological well-being has focused on the development of the various existing capacities for personal growth, these being conceived as the main indicators of positive functioning and thus of a positive self-image (Rahim et al. 2021).

Therefore, in view of the above, the present research aims to identify and establish the relationships between media pressure, psychological well-being, age, physical activity and adherence to the Mediterranean diet. This objective is broken down into (a) developing an explanatory model of media pressure, psychological well-being, age, physical activity and adherence to the Mediterranean diet and (b) testing the structural model by means of a multi-group analysis according to physical activity.

Material and methods

Design and participants

A descriptive, non-experimental (ex post facto), cross-sectional design was used for this study. A convenience sampling was used for the selection of participants, with a single measurement for a single group. The study sample consisted of a total of 634 participants, showing a homogeneous distribution according to sex. Female sex accounted for 55.5% ($n = 352$) and males 44.5% ($n = 282$). Study participants reported a mean age of $M = 35.18 \pm 9.68$ with a range of 18–66 years. Through different dissemination methods, the Spanish population was invited to participate, with the basic criteria of being of legal age and not exceeding the ordinary retirement age. In this way, a total of 53 questionnaires were eliminated because they did not meet the inclusion criteria or because they were incorrectly completed.

Instruments and variables

- **Sociodemographic questionnaire:** A self-drafted and self-recorded questionnaire was used to collect sociodemographic and physical-sporting aspects. The sex of the participants (male and female) and age were recorded. In this way, the time invested in the practice of physical activity and sport, expressed in minutes, was indicated. Based on this data and taking into account the minimum physical activity recommendations proposed by the World Health Organization (WHO 2020), we categorised whether or not the participants complied with these recommendations.
- **Sociocultural Attitudes Towards Appearance Questionnaire-4 (SATAQ-4):** This questionnaire on sociocultural attitudes towards appearance was used to assess social pressure towards physical appearance, specifically, it was used to assess the pressure exerted by the media. This research used the Spanish version adapted by Llorente et al. (2015). It consists of 22 items that respond to a Likert-type scale with five response alternatives where '1 = completely disagree' and '5 = completely agree'. This questionnaire allows the recording of five dimensions:

internalisation of a slim build (items 3, 4, 5, 8 and 9), internalisation of an athletic/muscular build (items 1, 2, 6, 7 and 10), family pressure (items 11, 12, 13 and 14), peer pressure (items 15, 16, 17 and 18) and media pressure (items 19, 20, 21 and 22). For the present study, the internal consistency of the questionnaire was $\alpha = 0.916$, while for the media pressure dimension a reliability of $\alpha = 0.967$ was obtained.

- **Psychological Well-Being Scales (PWBS):** This instrument was used to record psychological well-being. The abbreviated version adapted to Spanish by Díaz et al. (2006), originally from the psychological well-being scale proposed by Ryff and Keyes (1995), was used. The scale is composed of 29 items that are answered on a Likert-type scale with six response options, where '1 = strongly disagree' and '6 = strongly agree'). Ten of the items are formulated in reverse. Through this scale we can obtain the sum of psychological well-being and six dimensions that emerge from it: self-acceptance (items 1, 7, 19 and 31), positive relationships (items 2, 8, 14, 26 and 32), autonomy (items 3, 4, 9, 15, 21 and 27), mastery of the environment (items 5, 11, 16, 22 and 39), personal growth (items 24, 36, 37 and 38) and purpose in life (items 6, 12, 17, 18 and 23). An internal consistency of $\alpha = 0.918$ was obtained for the present study.
- **Prevention with Mediterranean Diet (PREDIMED):** This instrument was used to record data related to adherence to the Mediterranean diet. This tool was developed by Schröder et al. (2011), but for this study we used the Spanish version adapted by Álvarez-Álvarez et al. (2019). This is composed of a total of 14 items, where a dichotomous Likert-type scale is used to obtain the final score. The final score is categorised into three levels: low adherence (≤7), medium adherence (8–10) and high adherence (≤10). Finally, an internal consistency of $\alpha = 0.789$ was obtained.

Procedure

As a starting point, an exhaustive review of the scientific literature was carried out to extract information on existing and current problematic situations in society. Afterwards, a Google form was created by the Department of Didactics of Musical, Plastic and Corporal Expression of the University of Granada. This included the aforementioned instruments and detailed the aim and purpose of the study, offering the possibility of voluntary participation by giving informed consent when sending the form. For its administration, several channels were used; however, the most popular was the dissemination through social networks. Knowing the vulnerability and treatment of data through social networks, two questions were duplicated in order to detect that the questions had not been filled out randomly, thus ensuring the reliability and bias of the responses. Even so, a total of 53 questionnaires were eliminated because they were incorrectly completed or did not meet the inclusion criteria. Furthermore, this study complied with the ethical principles of research established by the Declaration of Helsinki (World Medical Association, 2009), ensuring anonymity and respecting the rights of the participants. In addition, the research was approved by the Ethics Committee of the University of Granada (1230/CEIH/2020).

Data analysis

For the descriptive analysis using frequencies and means, the SPSS 25.0 statistical software (IBM Corp, Armonk, NY, USA) was used. Cronbach's coefficient was used to determine the internal consistency of the instruments, establishing the reliability index at 95%. The AMOS 23.0 statistical software (IBM Corp., Armonk, NY, USA) was used to perform the multigroup structural equation analysis (SEM). SEM was used to establish the relationships between the variables that make up the theoretical model (Fig. 1) for both groups (participants who did or did not comply with the physical activity recommendations). Two different models were constructed, with the aim of verifying the relationships between variables according to the participants' physical activity practice. The SEM developed for this analysis was constructed from five observable variables that provide the explanations for the relationships. In this case, the causal explanations of the endogenous variables were made by considering the observed associations between the indicators and the reliability of the measurements. Thus, the measurement error of the observable variables was included in the model and can be directly controlled and interpreted as multivariate regression coefficients. The one-way arrows represent the lines of influence between the latent variables and are interpreted from the regression weights. A significance level of .05 was established using Pearson's Chi-square test.

The Mediterranean diet (MD) variable acts as an endogenous variable, which receives the effect of psychological well-being (PWB), physical activity practice (PA), age (AGE) and mass media pressure (MMP). Likewise, the variable psychological well-being (PWB) acts on the variables media pressure (MMP), physical activity practice (PA), adherence to the Mediterranean diet (MD) and age (AGE).

To verify the compatibility between the model developed and the empirical data obtained, the fit of the model was examined. Following the criteria proposed by Marsh (2007), the reliability of the model was obtained according to the goodness of fit. For the Chi-square analysis, values associated with a non-significant p value indicate a good model fit. Because this statistic is very sensitive to sample size effects, other fit indices must be used (Byrne 2010). Other parameters such as the comparative fit index (CFI),

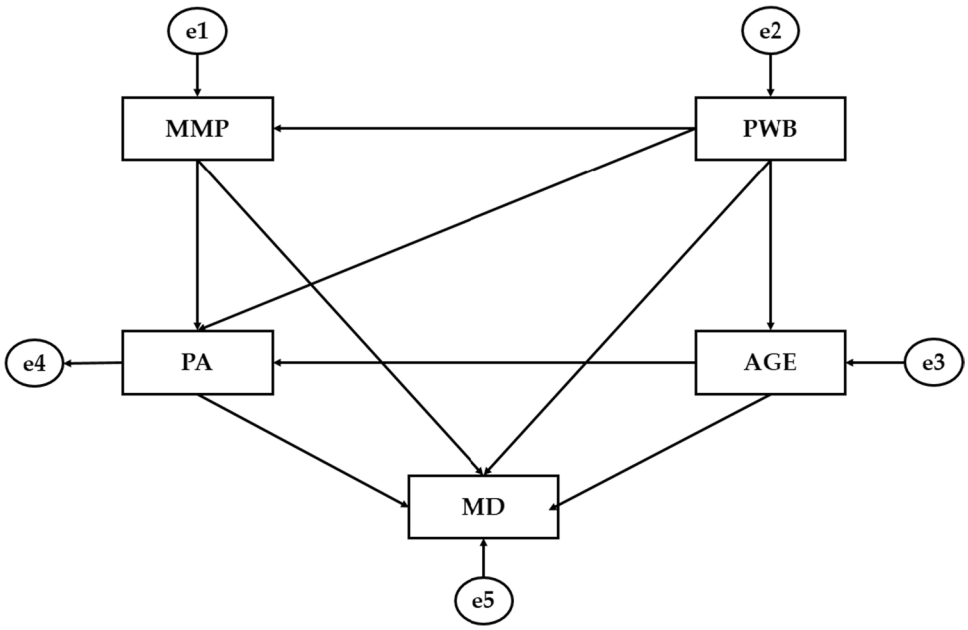


Fig. 1 The theoretical model. **Note:** mass media pressure (MMP); mediterranean diet (MD); physical activity (PA); psychological well-being (PWB); age (AGE)

normalised fit index (NFI), incremental fit index (IFI) and Tucker–Lewis index (TLI) were used. The values obtained must be greater than 0.90 to represent an acceptable fit and greater than 0.95 to represent an excellent fit. In addition, the root mean squared error of approximation (RMSEA) was used, where acceptable fit is determined by values at 0.08 and excellent fit with values below 0.05 (Bentler 1990; McDonald and Marsh 1990).

Results

The model developed by evaluating the variables measured in an adult sample aged 18–66 years in terms of meeting the recommendations proposed by the WHO (2020) showed a good fit of all indices. For the Chi-square analysis, a significant p value was found ($X^2 = 1.869$; df = 1; pl = 0.172). However, these indicators cannot be interpreted in isolation due to the susceptibility and influence of sample size (Marsh 2007). Thus, other standardised fit indices that are less sensitive to sample size were used.

For the comparative fit index (CFI) analysis, a value of 0.992 was obtained; for the normalised fit index (NFI) analysis, a value of 0.985 was obtained; and for the incremental fit index (IFI), a value of 0.993 was obtained, which describes an excellent fit. In the Tucker–Lewis index (TLI) analysis, a value of 0.925 was obtained, which is an acceptable fit. The root mean square error of approximation analysis (RMSEA) also obtained an excellent value of 0.043.

Figure 2 and Table 1 show the regression weights for the model as a function of meeting physical activity recommendations, for which statistically significant relationships were obtained at $p < 0.05$, $p < 0.01$ and $p < 0.001$. Among participants who complied with physical activity recommendations, psychological well-being (PWB) had a negative effect on media pressure (MMP) ($p < 0.001$; r = −0.379). However, PWB itself was positively associated with physical activity (PA) ($p < 0.01$; r = 0.237), adherence to the Mediterranean diet (MD) ($p < 0.01$; r = 0.238) and age ($p < 0.05$; r = 0.205). It should also be noted that MMP had an indirect effect on BP ($p < 0.01$; r = −0.216) and MD ($p < 0.05$; r = −0.206). Finally, BP ($p < 0.001$; r = 0.244) and age ($p < 0.05$; r = 0.191) had a positive effect on MD.

The model developed for the variables measured as a function of non-compliance with the recommendations proposed by the WHO (2020) showed a good fit for all indices. A significant p value was found in the Chi-square analysis ($X^2 = 0.136$; df = 1; pl = 0.850). In addition, other standardised fit indices were used, as the mentioned indicators may be susceptible to and influenced by sample size (Marsh 2007).

The fit of the model for the participants who did not comply with the physical activity recommendations was excellent, since in the analysis of the comparative fit index (CFI) a value of 0.999 was obtained; in the analysis of the normalised fit index (NFI), a value of 0.998 was obtained; in the incremental fit index (IFI), it was 0.994; and in the analysis of the Tucker–Lewis index (TLI), a value of 1.211 was recorded. Likewise, for the root mean square error of approximation (RMSEA) analysis, a value of 0.002 was obtained, which is excellent.

Figure 3 and Table 2 show the regression weights for the model for participants who did not comply with the physical activity recommendations and for whom

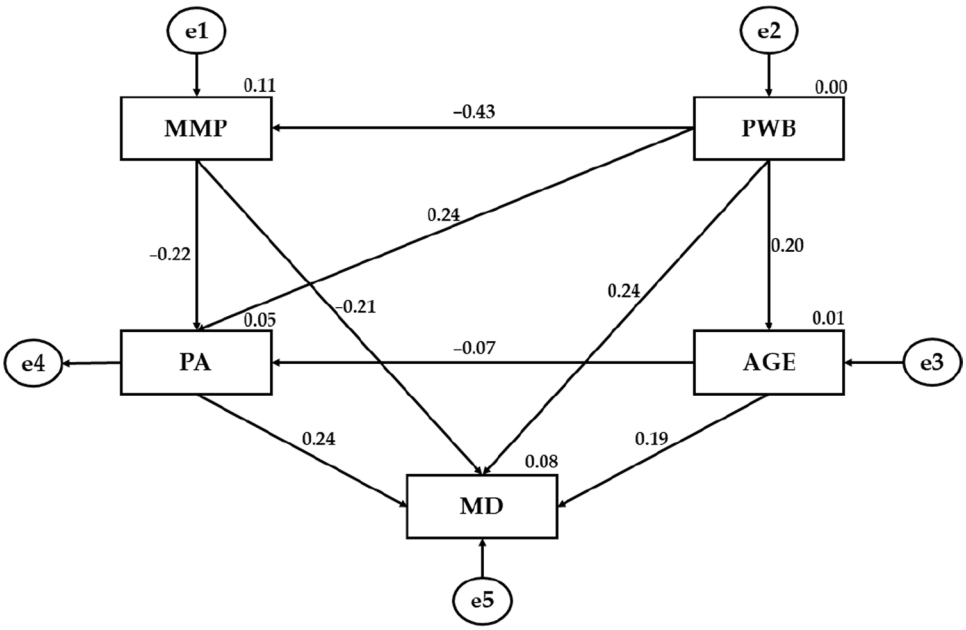


Fig. 2 The structural equation for individuals who did comply with the physical activity recommendations. **Note:** mass media pressure (MMP); mediterranean diet (MD); physical activity (PA); psychological well-being (PWB); age (AGE)

Table 1 The structural model for individuals who complied with the physical activity recommendations

Associations between variables			RW				SRW
			Estimations	SE	CR	P	Estimations
MMP	←	PWB	−0.667	0.087	−7.697	***	−0.434
AGE	←	PWB	1.548	0.674	2.297	*	0.205
PA	←	MMP	−12.853	5.312	−2.420	**	−0.216
PA	←	PWB	30.437	10.657	2.856	**	0.237
PA	←	AGE	−1.139	0.683	−1.667	0.096	−0.075
MD	←	AGE	0.020	0.010	2.043	*	0.191
MD	←	PA	0.002	0.001	3.179	***	0.244
MD	←	MMP	−0.173	0.077	−2.242	*	−0.206
MD	←	PWB	0.450	0.155	2.905	**	0.238

Note 1: *RW*, regression weights; *SRW*, standardised regression weights; *SE*, estimation error; *CR*, critical ratio. Note 2: *MMP*, mass media pressure; *MD*, Mediterranean diet; *PA*, physical activity ; *PWB*, psychological well-being; *AGE*, age; association between variables (←). Note 3: $p < 0.05$ (*); $p < 0.01$ (**); $p < 0.001$ (***)

statistically significant relationships were obtained at the $p < 0.05$, $p < 0.01$ and $p < 0.001$ levels. For these participants, PWB exerted a positive effect on MD ($p < 0.001$; r = 0.414) with greater strength than for participants who complied with the physical activity recommendations and with the same intensity of association for the BP variable ($p < 0.05$; r = 0.273). Thus, the negative effect of MMP on MD ($p < 0.001$; r = −0.325) and PWB ($p < 0.05$; r = −0.268) was greater. Finally, there was a direct and stronger relationship between age and MD ($p < 0.01$; r = 0.306) for participants who did not comply with the recommendations. No statistically significant associations were found between the other factors.

Discussion

This research shows the relationship between media pressure, Mediterranean diet, physical activity, psychological well-being and age according to the WHO physical activity recommendations. The results obtained respond to the objectives set out, so the present discussion follows the line of comparing the data obtained with those of another research already carried out.

In terms of the relationship between media pressure and psychological well-being, negative relationships are observed for both groups, with a higher significance for

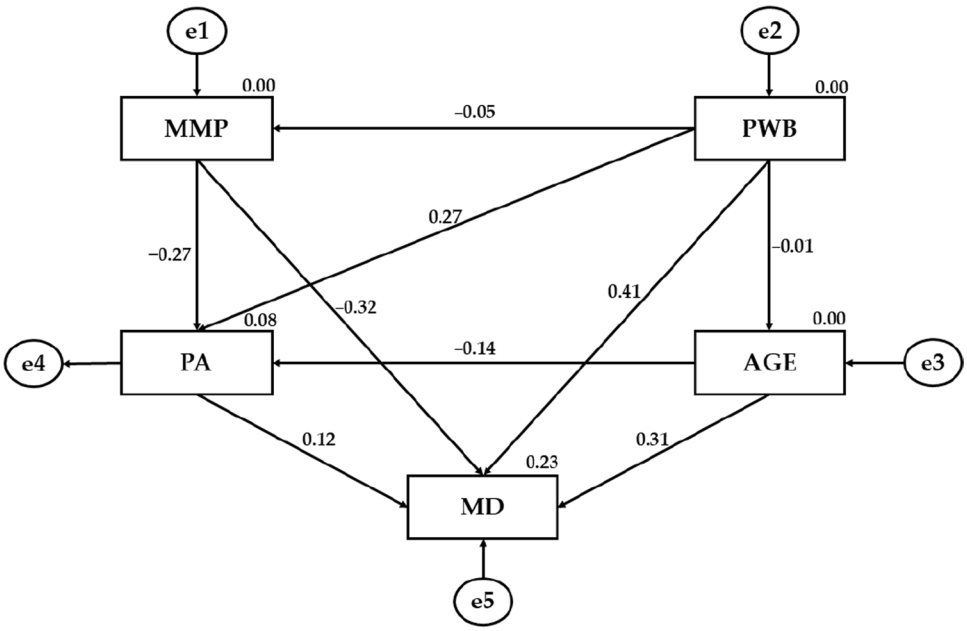


Fig. 3 The structural equation for individuals who did not comply with the physical activity recommendations. **Note:** mass media pressure (MMP); Mediterranean diet (MD); physical activity (PA); psychological well-being (PWB); age (AGE)

Table 2 The structural model for individuals who did not comply with the physical activity recommendations

Associations between variables			RW				SRW
			Estimations	SE	CR	P	Estimations
MMP	←	PWB	−0.084	0.144	−0.581	0.561	−0.046
AGE	←	PWB	−0.147	0.978	−0.151	0.880	−0.012
PA	←	MMP	−6.149	2.771	−2.220	*	−0.268
PA	←	PWB	11.596	5.060	2.292	*	0.273
PA	←	AGE	−0.746	0.407	−1.830	0.067	−0.138
MD	←	AGE	0.063	0.021	2.941	**	0.306
MD	←	PA	0.007	0.004	1.712	0.87	0.124
MD	←	MMP	−0.465	0.146	−3.192	***	−0.325
MD	←	PWB	1.188	0.266	4.460	***	0.414

Note 1: *RW*, regression weights; *SRW*, standardised regression weights; *SE*, estimation error; *CR*, critical ratio. Note 2: *MMP*, mass media pressure; *MD*, Mediterranean diet; *PA*, physical activity; *PWB*, psychological well-being; *AGE*, age; association between variables (←). Note 3: $p < 0.05$ (*); $p < 0.01$ (**); $p < 0.001$ (***)

participants who comply with the physical activity recommendations. Similar results were obtained by Marfil-Carmona et al. (2021), and Islam et al. (2021) stated that the media can have a negative impact on people's physical mental image and thus on their psychological well-being. Additionally, the study by Vandenbosch and Eggermont (2016) found that the pressure exerted by the media and social networks generates a beauty ideal aimed at acquiring weight reduction, causing personal body dissatisfaction and decreasing motivation towards physical-sports practice (Budzynski-Seymour et al. 2021).

Continuing with the relationship between age and psychological well-being, it is observed that participants who meet the criteria for physical activity reflect a positive relationship, to the detriment of those who do not meet the criteria. Given these findings, Veldema and Jansen (2019) suggest that the practice of physical activity has a positive impact on the physical and mental health of individuals, regardless of the age of the participants, due to the segregation of neurotransmitters during its practice (Ubago-Jiménez et al. 2020).

Observing the relationships obtained from the practice of physical activity, a negative relationship is obtained with the media and age, these results are similar to those obtained by Berry et al. (2020), stating that the media can have a negative impact on healthy lifestyles, encouraging behaviours that are detrimental to physical and mental health. Likewise, Haas et al. (2021) state that age plays a key role in the

decrease in the time spent doing physical activity, since as age increases there is a decrease in physical activity, as more sedentary activities are prioritised. On the contrary, positive relationships are observed between the practice of physical activity and psychological well-being. In view of these results, Muntaner-Mas et al. (2020) affirm that the practice of physical activity has a beneficial effect on mental health due to the secretion of neurotransmitters such as serotonin and dopamine (Alghadir et al. 2020) as well as the improvement of the mental image that participants have of themselves (Núñez et al. 2021).

In relation to adherence to the Mediterranean diet, a positive relationship with age is evident. In view of these results, Gensous et al. (2020) state that during adolescence there is a low adherence to a healthy dietary pattern; however, once this phase of human development has been overcome, there is an improvement in adherence to positive eating habits. Likewise, a positive relationship is also observed between adherence to the Mediterranean diet and the practice of physical activity, as Melguizo-Ibáñez et al. (2020) argued that there is greater awareness of healthy lifestyles, both in the nutritional and physical-sports spheres from an early age, due to the physical and mental benefits they provide. At the same time, a positive relationship is also observed between adherence to the Mediterranean diet and psychological well-being, and these results are similar to those obtained by (Marchena et al. 2020), affirming Trigueros et al. (2020a, b) that healthy food intake has a positive impact on the control of disruptive states such as anxiety, depression and stress, as well as an improvement in physical self-concept (Zurita-Ortega et al. 2018). In contrast, a negative relationship is obtained between adherence to the Mediterranean diet and mass media pressure, these results being similar to those obtained by Marfil-Carmona et al. (2021). In view of these findings, Zou et al. (2020) argue that the media have a powerful reach, but Spadine and Patterson (2022) point out that the nutritional messages they convey are mostly erroneous, with a predominance of advertisements for unhealthy and pre-cooked products, as well as a bias towards diets based on calorie imbalance.

Limitations and future perspectives

The current research has a series of limitations since, due to its design as a cross-sectional study, it only allows us to study the relationship between the variables at that moment in time, and is not able to establish causal relationships between the variables over a longitudinal period. Furthermore, the sample of participants belongs to a very specific geographical area; therefore, it is not possible to establish generalisations in a wider area of the national geography. It should also be noted that despite the use of reliable and validated questionnaires for data collection, these, being a self-affirmation instrument, have an intrinsic error.

With a view to future perspectives and observing the results obtained, it is intended to develop a longitudinal study and to study the effects in the short and medium term of the impact of the media on the variables presented in the study.

Conclusions

In general, acceptable values were obtained for the different parameters of the general equation. The present study shows the relationships between media pressure, psychological well-being and health.

Based on the models developed, it can be seen that for those who claim to meet the WHO physical activity criteria, there is a negative relationship between psychological well-being and media pressure. Likewise, negative associations between physical activity and media pressure and age are also evident. There is also no positive relationship between adherence to the Mediterranean diet and media pressure. In contrast, positive relationships were found between age and psychological well-being, physical activity and psychological well-being, Mediterranean diet and age, Mediterranean diet and physical activity, and between Mediterranean diet and psychological well-being.

Focusing attention on the model of those participants who claim not to meet the WHO physical-sports criteria, negative relationships are obtained between psychological well-being and media pressure, age and psychological well-being and media pressure and physical activity practice. Likewise, negative relationships are also observed between physical activity practice and age and media pressure and adherence to the Mediterranean diet. Finally, positive relationships are shown between psychological well-being and physical activity practice, adherence to the Mediterranean diet and age, physical activity practice and Mediterranean diet, psychological well-being and adherence to a healthy dietary pattern.

Author's contribution **Conceptualization,** G.G.V, P.P.M and R.M.C; **methodology,** F.Z.O, M.O.C and E.M.I.; **software,** F.Z.O., G.G.V and P.P.M.; **validation,** P.P.M, M.O.C and R.M.C.; **formal analysis,** E.M.I, M.O.C and R.M.C.; **investigation,** P.P.M, R.M.C, G.G.V.; **resources**, F.Z.O.; **data curation,** F.Z.O., P.P.M.; **writing – original draft preparation,** F.Z.O., E.M.I. and P.P.M.; **writing – review and editing,** F.Z.O., G.G.V., P.P.M., M.O.C. and R.M.C.; **supervision,** F.Z.O., G.G.V. and P.P.M.

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Availability of data and material Not applicable.

Code availability Not applicable.

Declarations

Ethics approval This research was approved by the University of Granada ethics committee (1230/CEIH/2020).

Consent to participate Informed consent has been obtained from all study participants.

Consent for publication All authors give their consent to publish the data obtained. All authors have read and agreed to the published version of the manuscript.

Conflict of interest The authors declare that they have no conflict of interest.

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