An Ecological Approach to Adolescent Life Satisfaction and Wellbeing across Mediterranean Countries

Tania Gaspar*[1], 2Concepción Moreno-Maldonado, [3]Adilson Marques, [4]Vanesa Salado, [5]Margarida Gaspar-Matos, [6]Oya Ercan, [7]Clive Richardson, [8]Myrto Sravrou, [9]Lorena Charrier, [10]Riki Tesler, Ph.D., [11]Antony Morgan, [11]Candace Currie

[1]CHRC/Lisbon NOVA University, Portugal

[1]Lusófona University/SPIC, HEI-LAB Portugal

[2]Department of Evolutionary Psychology and Education, University of Seville

[3]FMH/ Lisbon University, Portugal

[4]Department of Experimental Psychology, University of Seville, Spain

[5]ISAMB – FM/ Lisbon University, Portugal

[6]Department of Pediatrics, Istanbul University-Cerrahpaşa-Turkiye

[7]Panteion University of Social and Political Sciences, Athens, Greece

[8]University Mental Health, Neurosciences and Precision Medicine Research Institute "Costas Stefanis" (UMHRI), Athens, Greece

[9]Department of Public Health Sciences and Paediatrics, University of Torino

[10]The Department of Health Systems Management, Ariel University, Israel

[11]Glasgow Caledonian University London

***Corresponding author**

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ABSTRACT

Multi-level influences that impact upon adolescents' health have been conceptualized within the framework of ecological models. This ecological model used data from a large cross-national study to demonstrate the influence of social determinants of health situated at different system levels. The Health Behaviour in School-aged Children (HBSC) is a World Health Organization collaborative cross-national study conducted every 4 years in 52 countries and regions across Europe and North America (http://www.hbsc.org). HBSC data was examined on a selection of health and wellbeing indicators, health-related measures, and developmental context, collected in the 2018/2019 wave, using the international research protocol and questionnaire. The sample included 39,247 students from the Mediterranean countries (Greece, Israel, Italy, Malta, Portugal, and Spain). The mean age of the participants students was 13.6 years (*SD* 1.6), 52.1% were girls. Using an ecological framework, the determinants of adolescent well-being were examined from the individual to the national level. 31% of the variance in life satisfaction was explained by the following factors: being a boy, younger, higher family affluence, fewer psychological symptoms, frequent physical activity, daily fruit and vegetables consumption, not drinking alcoholic beverages, high family support, positive relations with teachers and school friends, and not having been bullied. When the analysis was stratified by country, findings were varied, though more similarities than differences were found.

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In order to improve the health of the adolescent population, there is a need for more sustainable multisectoral public policies to take into account developmental life challenges, aiming to reduce health inequalities.

Keywords: Adolescents; Ecological model; Life satisfaction; Wellbeing/Health; cross-cultural.

INTRODUCTION

Understanding the determinants of health in adolescence is crucial in reducing health inequalities related to social and economic circumstances and promoting well-being (Viner et al., 2012). Factors that influence adolescent health stem from individual characteristics, immediate social contexts related to the family, school, and peers (micro-systems), and conditions in their neighborhoods and communities where micro-systems interact (creating meso-systems), as well as from the wider social, cultural, and economic conditions in the country or larger geographic region – known as macro-systems (Currie & Morgan, 2020). These multi-level influences have been conceptualized within the framework of ecological models. One of these, the bio-ecological framework developed by Bronfenbrenner (1992) and Bronfenbrenner and Ceci (1994), has been adapted to map the determinants of adolescent health by Currie and Morgan (2020). These authors examine influences on adolescent mental health by drawing on research evidence from the long-running international Health Behaviour in School-Aged Children (HBSC) study, a unique World Health Organization's collaborative cross-national research study (Inchley et al., 2020).

This paper focuses on life satisfaction, an important indicator of positive mental health in adolescence (Due et al., 2019; Levin et al., 2011; Lukoševičiūtė et al., 2022), analyzing data from countries in the Mediterranean region of Europe that took part in the HBSC 2017/2018 study. It employs the Currie and Morgan (2020) approach to determine a data analysis plan that enables the construction of a multilevel framework of factors that can affect life satisfaction in these neighboring countries.

Applying a bio-ecological or biopsychosocial framework (Bronfenbrenner, 1992; Bronfenbrenner & Ceci, 1994, Buzzi et al., 2020; Currie & Morgan, 2020) enables the identification of determinants of adolescents' life satisfaction operating at multiple, interacting system levels according to these theories (individual, interpersonal and macrosystemic level).

In this sense, research such as that of Gilman and Huebner (2003) found that life satisfaction was positively related to social relationships with family and friends and negatively related to depressive and anxiety symptoms. Likewise, Valois et al. (2009) found that greater parental support was associated with greater life satisfaction in adolescence. These relationships allow us to know the determinants of development that promote the life satisfaction of boys and girls from different contexts. In this sense, this research aims to know how the life satisfaction of adolescents is related to personal, social and behavioral assets framed in ecological theories. Likewise, this study becomes essential to know more information about the relationship between life satisfaction and other determinants such as alcohol consumption or suffering bullying that can occur in other contexts such as school. According to several studies, boys and girls with a low connection to the school context will have a higher risk of peer victimization and depressive symptoms (Shochet et al. 2006; Skues et al. 2005). That is why this study aims to find patterns of association between different biopsychosocial factors, according to different ecological levels, with life satisfaction. Likewise, the authors focus on six Mediterranean countries to identify the similarities and differences between them in the relationships found. The justification for considering only the Mediterranean area is justified by the cultural similarities that adolescents may have in the contexts in which they develop. For example, research has shown that people's social, cultural and well-being characteristics differ depending on the region where they live. For example, in Mediterranean areas, young people tend to see their parents as a greater source of support than in other areas, because of the lack of early independence that occurs in other countries. This fosters a greater link with their developmental contexts and, consequently, greater relationships in the different facets of socialization (Buchmann & Kriesi, 2011; Dotterer et al., 2008).

Therefore, it is considered necessary to present the factors considered in this research, segregated according to their ecological level in order to frame in a more specific way their relationships with life satisfaction from ecological models.

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At the individual level

According to the model of social determinants of health, individual characteristics such as gender, age, and socioeconomic status are in themselves structural determinants of health within ecological systems, as factors that generate social stratification systems (Solar & Irwin, 2010). The association between adolescent life satisfaction and a wide range of health-related individual behaviors has been well established (Eime et al., 2013; Shi et al., 2019). First, an association between physical activity and life satisfaction has been found in several studies using HBSC data in national (Brooks et al., 2015; Kleszczewska et al., 2018; Lukoševičiūtė et al., 2022) and international samples (Ianotti et al., 2009; Meyer et al., 2021) as well as in non-HBSC studies (Valois et al., 2004). However, research on the association between fruit and vegetable consumption and adolescent life satisfaction is limited. Life satisfaction has been found to be higher among non-risky single occasion drinkers (Charrier et al., 2020; Kuntsche & Gmel, 2004) and lower among adolescents who report smoking, alcohol consumption, and cannabis use at least once in their lifetime (Lew et al., 2019).

Lastly, research on the determinants of life satisfaction has consistently found that the health status is one of the main explanatory factors (Diener & Chan, 2011). Along these lines, good self-perceived health (Lombardo et al., 2018) and absence of psychosomatic symptoms (Gilman & Huebner, 2006) have been associated with higher levels of life satisfaction in adolescents. Also, a previous study using HBSC data (Kelleher et al., 2007) found that adolescents who reported poor self-perceived health also reported lower life satisfaction and more health complaints.

At the interpersonal level

Regarding interpersonal relationships, social support from different contexts (friends, family, classmates) is an essential asset for health (Piko & Hamvai, 2010). Recent research has found significant positive correlations between perceived social support and positive psychological well-being among adolescents (Arikan et al. 2019; Wilson et al., 2020). Family remains a crucial context of development throughout childhood and adolescence, with a strong impact on the subjective well-being of young people (Hair et al., 2008; Piko & Hamvai, 2010). Within the school context, previous studies have synthesized the impact of school factors on the academic, behavioral, and socio-emotional development of young people (Meece & Eccles, 2010; Roeser et al., 2000). Specifically, peers provide one of the strongest influences on the health and well-being of young people (Oliva et al., 2011). A positive association between connection with teachers and emotional well-being has also been demonstrated (García-Moya et al., 2015), as well as the beneficial effects of peer support and a good school climate on psychosomatic health (Freeman et al., 2012). Furthermore, Currie and Morgan's (2020) review of HBSC papers concluded that school and relationships with teachers and classmates were consistent predictors of life satisfaction. The perceived support of family, peers, and school have been shown to be strong protective factors against low life satisfaction and high levels of health complaints in specific vulnerable communities such as immigrant adolescents with different ethnic backgrounds, after considering the effect of socioeconomic status (Borraccino et al., 2020). Similarly, in a 2020 study of adolescents in 37 countries (Walsh et al. 2020), low social support was found to be a strong predictor of low life satisfaction.

At a macro-system level

From a contextual point of view, adult life satisfaction has been demonstrated to be sensitive to a country's economic prosperity, with a stronger impact of socioeconomic position at the individual level in less wealthy countries (Schyns, 2002). These results have been confirmed in international studies of adolescents where economic inequalities at the national level are found to moderate the association between family affluence and adolescent life satisfaction (Bjarnason et al., 2012). Similarly, a study conducted by Levin et al. (2011) with HBSC data showed that family material affluence had a stronger effect on adolescents' life satisfaction in countries with lower national income and greater income inequality. In countries where the unemployment rate is high, parents might project to their children their own high expectations about their children's academic success at all levels of education. In this sense, a study using HBSC data showed a decrease in adolescents' life satisfaction during the years of the economic recession in Greece, with the effects of the recession being more severe for older adolescents (Kokkevi et al., 2017), while in a study of 27 countries (Johansson et al., 2019) higher national unemployment rates were found to be associated with lower adolescent life satisfaction. Also, in

a 2020 study using HBSC data (Weinberg et al., 2021) meritocratic beliefs at the country level were found to moderate the associations between indicators of socioeconomic status and life satisfaction in adolescents.

Besides national wealth, welfare systems and social policies are important for adolescent health. Rathmann et al. (2015) found differences in adolescent psychosomatic complaints across different welfare systems and established that such systems could moderate the impact of socioeconomic inequalities on health (Navarro et al., 2003, Zambon et al., 2006). Richter et al. (2012) also found that welfare systems accounted for 7% of the variance in adolescent health between countries. Taking a contextual perspective these findings indicate that different social policies can have an impact on the health of the youngest.

The present research

Adolescent development is a complex and multidimensional process that must be analyzed in a global and integrated manner using a biopsychosocial perspective. Following this approach, the objective of this paper was to understand and characterize life satisfaction among adolescents in six countries of the Mediterranean region through a psychosocial perspective, considering the impact of biopsychosocial factors on adolescents' life satisfaction, and exploring similarities and differences between these Mediterranean countries in the patterns in which ecological factors are related to adolescent life satisfaction. In addition, this research examines gender and age group differences in all studied variables. An important contribution of this research is the study of adolescent life satisfaction by understanding the impact of the different levels from a gender and age perspective, and, since this is a cross-national study, identifying similarities and differences between countries in the Mediterranean area.

METHODS

Participants and procedure

The HBSC cross-national study has taken place every 4 years since 1982 (for more information about the study, see http://www.hbsc.org). Data collection procedures in all participant countries and regions (currently 52 across Europe and North America) are developed in accordance with a standardized international protocol which is produced by the HBSC research network (available from the study website). Each country obtains ethical approval through the competent bodies and follows the specific procedures required to conduct the survey, adhering to the criteria that participation must be voluntary, and anonymity guaranteed. Data are collected from a nationally representative random cluster sample of 11-,13-, and 15-year-old in each country by self-completion of questionnaires in the classroom. The primary sampling units are classes or schools. More detailed information about methodology of the HBSC study can be found elsewhere (Inchley et al., 2018).

The present study data were collected in the survey year 2017/2018 and includes 39,247 students from Mediterranean countries (Greece, Israel, Italy, Malta, Portugal, and Spain). The mean age was 13.6 years (standard deviation 1.6) and 52.1% were girls. Age and gender characteristics by country are shown in Table 1.

Measures

The instrument employed was the HBSC questionnaire for the 2017/2018 survey cycle (Inchley et al., 2018). Specifically, the following measures were selected:

At the individual level (dependent variable):

Life Satisfaction, which was evaluated using the "Cantril Ladder Scale" (Cantril, 1965). The adolescents rate their overall life satisfaction on a scale of 0 to 10, 0 being associated with greatest dissatisfaction and 10 with greatest satisfaction. The scale has been validated for use with adolescents (Levin & Currie, 2014).

At the biopsychological level

In addition to gender and age, health-related behaviors and well-being were assessed at the individual level as follows:

Self-perceived health was measured using an item that evaluates the perception of current health (Idler & Benyamini, 1997), on a scale from 1 (poor) to 4 (excellent). It was employed as dichotomized in this study.

Psychological symptoms were measured using the "HBSC symptom checklist". The scale has demonstrated high reliability and validity for cross-national studies (Haugland et al., 2001; Haugland & Wold, 2001; Levin & Currie, 2014). The final score was obtained through the sum of four psychological symptoms (sadness, nervousness, irritability, and difficulties in sleeping), each of which was answered on a scale that assessed the frequency of experiencing these symptoms, ranging from 1 (every day) to 5 (rarely or never), thus with a total range from 4 to 20. This variable was employed as continuous in this research.

Physical activity was assessed through a question adapted for use in the HBSC study (Prochaska et al., 2001): and was calculated by the number of days in which the adolescents felt physically active for at least 60 minutes a day in the last 7 days (moderate-to-vigorous physical activity). The response options ranged between 0 (never) and 7 (every day). In this study it was used as a continuous variable.

Alcohol consumption recorded whether the adolescent had ever consumed alcohol. Responses to "How many days in your lifetime?" were dichotomized as 0 for no risk behaviour (never) or 1 for risk behaviour (at least one day or more).

Daily consumption of fruit and vegetables was assessed by asking participants "How many times a week do you usually eat… fruit / vegetables (for example tomatoes, lettuce, lentils, chickpeas, spinach, etc.)", in two separate questions. The response categories collected information about the weekly frequency of consumption, with 1 as the minimum (never) and 7 as the maximum frequency (every day, more than once a day). For this study, response options were dichotomized by combining the responses as 1 for daily consumption ("every day", and "every day, more than once") and 0 for less than daily consumption (all other responses).

At the Interpersonal level

For the family context, the family subscale of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) was used. This consists of four questions covering whether the family is a source of help, emotional support, a place the adolescent can talk freely about their problems, and who helps them make decisions (each answered on a 7-point scale; total range 4 to 28). A mean overall score was created by summing the item scores and dividing by the number of items. Higher scores represent higher support from the family. In the original study, alpha reliability for the 4-item scale was .87 indicating good internal consistency. In this study, Cronbach's coefficient alpha was .91.

At the school level, the adolescent's relationship with other students and the teacher was examined. To evaluate the relationship between classmates, the peers' subscale of the MSPSS was used. Adolescents were asked if their classmates accept them, if they like to be together, and if they were kind and helpful (answered on 5-point scales; total range 3 to 15). A mean overall score was created by summing the item scores. Higher scores represented lower support from peers. Cronbach's coefficient alpha in the original study of this subscale was .85, showing good internal consistency. In the present research, the value of Cronbach's alpha was .75.

Teacher support was measured by asking adolescents three questions about the teacher's acceptance of the student, concern for the student, and their trust in the teacher (answered on 5-point scales; total range 3 to 15). The original four-item version of the scale was developed and validated within the international HBSC network (Torsheim et al., 2000). The scale has a high internal consistency with a Cronbach's alpha of .82 (Rasmussen et al., 2013). Further development and validation carried out in different countries within the HBSC network (Freeman et al., 2017) support the reduction of the scale to three items, as used in this research. A mean score was created as for the other scales. Higher scores represented lower teacher support. Cronbach's coefficient alpha in this study was .82.

As the socioeconomic level refers to the family, it might be considered as an attribute of both the individual and of the family at the microsystem level. It was assessed using the FAS (range 0-13), which includes items that measure family economic/material assets: number of cars, having one's own bedroom, number of computers,

number of bathrooms in the home, number of family holidays taken in the past year, and having a dishwasher in the home. FAS has been developed and validated as a comparative measure of family material wealth/deprivation for European adolescents (Currie et al. 1997; Currie et al., 2008; Torsheim et al., 2016).

Finally, in relation to bullying, adolescents were asked if they had been bullied with the response coded as 0 (never been bullied) or 1 (involved once or more as a victim).

Data analysis

Given the relevance of age and gender in the development of adolescents, descriptive statistics were calculated for all variables (means and percentages) stratified by gender and age. Chi-square or Student t-test –depending on the nature of the variables– were employed to examine age and gender differences in all the examined variables. A linear regression model (using Enter method) was used to test the relationship between different biopsychosocial factors and life satisfaction. Analyses to test for multicollinearity were conducted with the variance inflation factor and tolerance. Multicollinearity problems among variables were not observed. A single model was fitted for each adolescent behaviour, relationships, and contexts. Finally, to examine similarities and differences in patterns of ecological factors explaining life satisfaction in the different countries, a linear regression analysis stratified by country was performed. Analyses were conducted with SPSS 27.

RESULTS

Participant characteristics and gender differences on the listed measures are presented in Table 1. Statistically significant differences were observed between boys and girls in all variables except for the relationship between adolescents and their teachers. Boys had a better perception of health, a lower frequency of psychological symptoms, higher levels of physical activity, a better perception of family support, more positive relationships with family and peers, and higher levels of life satisfaction than girls. Girls reported more frequent consumption of fruit and vegetables, less alcohol consumption, and less frequent bullying as compared to boys. Age group differences are shown in Table 2. Younger adolescents (6th grade) showed higher life satisfaction. All measures of health ratings and health-related behaviours became less positive with increasing age, except for the frequency of being bullied, which decreased with age. Boys and older adolescents reported a higher family affluence.

***** Table 1 *****

***** Table 2 *****

Tables 3 and 4 present the results of the linear regression models of the relationship between life satisfaction scores and adolescent individual characteristics (gender, age, and socioeconomic status), well-being indicators and health-related behaviours, and relationships with contexts.

A linear regression model was developed to assess the relationship between biopsychological and social factors and life satisfaction among adolescents (Table 3). The model obtained explained 31% of variance in the dependent variable. All the examined variables (except gender) were significantly associated with life satisfaction when all countries were analysed. Higher life satisfaction was best explained by family support, low psychological symptoms, positive health perception, and teachers support, in that order. Predictive factors of having a higher life satisfaction are: at individual level, higher socioeconomic status, being younger, having a positive health perception, low psychological symptoms and regarding health behaviours, presenting healthy eating habits, frequent physical activity, and no alcohol consumption. At the social level, being the most relevant relationship with the perceived support from family, positive relationship with teachers and peers, and not being bullied also explained the adolescents' higher life satisfaction.

When the analysis was stratified by country (Table 4), explained variance ranged from 18% for Israel to 38% for Italy. Seven factors were related to life satisfaction in all countries, namely, age, FAS, psychological symptoms, self-perceived health, family support, and relationship with teachers and classmates. Higher life satisfaction was also associated in all countries with healthy eating behaviour except in Malta and with physical activity except for Italy. In addition, low life satisfaction was associated with having been bullied in all countries

except for Spain. Gender and alcohol consumption were not generally associated with life satisfaction, except for Greece and Spain for gender (where being male was related with higher life satisfaction) and Portugal for alcohol consumption (where not having consumed alcohol was related with higher life satisfaction).

DISCUSSION

These results deepen our understanding of adolescent life satisfaction in several Mediterranean countries from an ecological perspective. The examined model integrated aspects of adolescents' biopsychological characteristics and their relationship with their social contexts.

Firstly, our results revealed that boys and girls presented a different risk dynamic considering their well-being, health behaviours, and relations with their social contexts. Boys showed a greater satisfaction with life, consistent with previous findings (Branquinho et al., 2021; Gaspar et al., 2020; de Looze et al., 2018). However, in recent meta-analytical research conducted from 1980 to 2017 (Chen et al., 2020) boys and girls showed equal levels of life satisfaction. Geographical differences could explain the inconsistent evidence for gender inequalities in life satisfaction.

In line with previous studies, boys had a more positive perception of their health (Vélez et al., 2009), lower psychosomatic symptoms (physical and psychological) (Aanesen et al., 2017; Gaspar et al., 2020; Torsheim et al., 2006), and were more physically active (as was found in a recent narrative review by Aubert et al., 2021). Regarding the microsystemic factors, boys also presented more support from the family (Gaspar et al., 2021; Levin et al., 2012) and a better relationship with friends (Gorrese, 2016).

Even though girls exhibiting more difficulties at the personal and social levels, and in line with previous findings, they showed a higher likelihood of daily fruit and vegetable consumption (Vereecken et al., 2015; Voráčová et al., 2015), less alcohol consumption (Dir et al., 2017) and were less likely to have been bullied (Esposito et al., 2019).

Therefore, in addition to having lower levels of health by all indicators, girls present more difficulties in engaging in physical activity and showed a lower perceived support from their families and classmates. There were no gender differences in teacher support. Interventions for reduction of gender inequalities in adolescents should include the promotion of health, physical activity, and supportive context for girls specifically. In addition, programs aimed at reducing violence and bullying and promoting school engagement should reinforce these components more in boys.

Secondly, this study also confirmed previous findings showing that adolescent life satisfaction, as well as all biopsychological and social factors analyzed follow a developmental trend indicating less positive well-being indicators and less healthy behaviors (Bluth et al., 2017; Khan et al., 2021; Lukoševičiūtė et al., 2022) as well as poorer relationships (Hartas, 2021) with increasing age, except for being bullied, which after an increase in early adolescence, decreases as age increase in high school years (Mitsopoulou & Giovazolias, 2015).

Regarding the main objective of this study, the associations of all biopsychological and social factors with adolescent life satisfaction were examined in six Mediterranean countries. All variables –except for gender – were found to be significantly associated with adolescent life satisfaction, with high family support the most relevant factor explaining higher life satisfaction. Following family support, having lower psychological symptoms, and a positive self-perceived health, and relationships with teachers were the most significant variables. In addition, this study also showed that higher life satisfaction was explained by higher socio-economic level and positive health behaviours at the individual level, namely, physical activity, healthy eating behaviour, and no alcohol consumption. At the social level, a positive relationship with classmates and not being bullied explained the adolescents' higher life satisfaction.

Finally, the study provides an ecological understanding of patterns in which different biopsychological and social factors are related with adolescents' life satisfaction in various Mediterranean countries, identifying differences and similarities. We found more similarities: most of the factors were related to life satisfaction in all or in almost all countries. However, this study found also specificities in some countries.

This study highlights the importance of the family context for adolescent life satisfaction in the Mediterranean countries. Family support was the variable most strongly related with life satisfaction in all countries, which may be explained due to strong family ties in the studied countries (Pace et al., 2016).

At the social level, the relevance of the family in adolescent life satisfaction was followed by having positive relationships with teachers, and classmates. Only in Italy was life satisfaction more significantly associated with the relationship with classmates than with teachers. These variables, and also being bullied, were significant in all countries except being bullied in Spain. Previous findings have shown a stronger influence of perceived support from the family than from other sources in Spain and Portugal (Jiménez-Iglesias et al., 2017). This result is also consistent with the findings of Bi et al., (2021), who explored the role of different sources of support in 42 HBSC countries and consistently found the relevance of the family, followed by teachers, and classmates support, while support from peers had the weakest influence. In addition, in a Portuguese study, school connectedness and family support were the strongest predictors of adolescents' life satisfaction among other factors considered, followed by individual social competence, academic achievement, and self-regulation (Calmeiro et al., 2018).

Regarding the fact that having been bullied was not associated with life satisfaction in Spanish adolescents, this result might be explained by the policies based on reducing bullying that have been implemented in the country in recent years. According to a multilevel study carried out by HBSC among 30 European countries, adequate mental health interventions in the youngest age group are associated with a decrease in aggressive behaviors (Hendriks et al., 2020) and consequently with an improvement in indicators of youth health.

At the individual level, gender was not generally associated with life satisfaction except in Greece and Spain (where being male was related to higher life satisfaction) and alcohol consumption was not generally associated with life satisfaction (except in Portugal) where not having consumed alcohol was related with higher life satisfaction). A study of this kind is not meant to raise explanations, however, in the case of gender, there is a possible suggestion of increased gender inequalities in Greece and Spain, and considering alcohol consumption, there is a suggestion of an history of a culture of alcohol experimentation (but not alcohol abuse) in Portugal.

Also at the individual level, age, FAS, psychological symptoms, and self-perceived health were significantly associated with life satisfaction. As in this study, the decrease in life satisfaction during adolescence has been reported previously (Orben et al., 2022), as well as its association with low family material affluence (Zaborskis & Grincaite, 2018). Moreover, it should be noticed that after the family, the well-being indicators were the most significant variables correlated with adolescent life satisfaction in all countries.

These results are supported by the research conducted by Gilman and Huebner (2006) who found noticeable differences in adolescents' life satisfaction related to psychological symptoms: no adolescents classified in the upper 20% of the distribution of life satisfaction presented clinical levels of symptoms, whereas in the lowest 20% of the distribution 42% reported clinical levels. Similarly, in a Canadian study, a group of adolescents classified as having poor self-perceived health presented particularly low life satisfaction (Lombardo et al., 2018).

Physical activity also showed an important role for life satisfaction among adolescents from Mediterranean countries, showing a significant and positive relationship with life satisfaction in Greek, Israeli, Maltese, Portuguese, and Spanish adolescents, but not being significant in Italy. This result is not consistent with other findings that have shown a positive association between physical activity and life satisfaction among Italian adolescents (Pierannunzio et al., 2022), the exception should thus be interpreted with caution. Regarding the consumption of fruits and vegetables, a positive relationship with life satisfaction was observed for all countries except for Maltese adolescents. Similarly, a recent systematic review has found that adherence to a Mediterranean diet is associated with better mental health, measured through the health-related quality of life (Romero-Robles et al., 2022).

It seems that in Spain, Portugal, Greece, and Israel and other subsystems of a lower level will be those that affect the promotion of the health of young people, such as relationships with the family and with peers (Calmeiro et al., 2018; Karademas et al. al., 2008) or the establishment of educational programs to promote healthy eating

habits and physical activity, leading to an improvement in life satisfaction (Moral-García et al. 2021). A systematic review of health programs in schools in several European countries confirmed the importance of these interventions in reducing sedentary habits and improving mental, psychosocial, and academic behaviour in adolescents (Mura et al., 2015).

Strength And Limitations

This study had some limitations that should be taken into account. The nature of the cross-sectional design did not allow us to draw definitive conclusions about the direction of the described associations. It should also be taken into account that we relied on student self-reports which can be considered as a source of bias. However, this study relies on a large number of adolescents, and can be considered as representative of the respective age groups in the six countries examined.

CONCLUSIONS

The present study makes a strong contribution to the description of gender, age, and geographic differences in adolescents' lives, their links to health and well-being, and perception of social support.

From a public health and public policy perspective, relevant messages must address behaviors which are potentially changeable, allowing more friendly social and physical life contexts/ lifeworlds.

Therefore, the more striking message arising from this study is that to improve the adolescent population's health and well-being there is a generalized need to decrease inequalities. This should be done by sustainable and multisectoral public policies targeting the better provision of organized educational, health, and local services to cope with developmental life challenges, aiming at fading iniquities, now and in the long run. Fading iniquities, besides being a global human right, much aligned with the Sustainable Development Goals, namely SDG 1, 5, 10, has a strong impact on SDG 3 and 4

While facing uncertainty and challenging times, there is a stronger need to foresee and to get prepared (by anticipating and alerting) in order to act in a preventive way (Matos & Wainwright, 2021).

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Table 1 Participants' characteristics and gender differences

	Total	Boys	Girls	*p*
Variables	% or Mean (SD)	% or Mean (SD)	% or Mean (SD)	
Gender				
Boys	47.9%			
Girls	52.1%			

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Country				
Greece	13.4%	49.9%	50.1%	
Israel	26.8%	45.2%	54.8%	
Italy	14.4%	48.2%	51.8%	
Malta	9.0%	48.1%	51.9%	
Portugal	21.3%	47.8%	52.2%	
Spain	15.0%	48.3%	51.7%	
Age	13.55(1.63)			
FAS (0-13)	7.49(2.69)	7.56(2.70)	7.43(2.69)	<.001
Self-perceived health (Good)	88.7%	93.3%	87.2%	<.001
Psychological symptoms (low) (4-20)	13.93(4.56)	14.63(4.35)	13.29(4.66)	<.001
Physical activity in the last 7 days (0-7)	3.67(2.15)	4.07(2.15)	3.31(2.09)	<.001
Healthy Eating (yes)	23.4%	21.4%	25.2%	<.001
Alcohol use (1-7)	1.92(1.67)	2.06(1.78)	1.79(1.56)	<.001
Family support (4-28)	23.99(5.80)	24.09(5.73)	23.89(5.87)	<.001
Teacher relationship (3-15)	11.63(2.78)	11.64(2.85)	11.63(2.73)	0.75
Peers' relationship (3-15)	11.66(2.60)	11.82(2.56)	11.51(2.63)	<.001
Been Bullied (yes)	22.3%	24.6%	20.2%	<.001
Life satisfaction (0-10)	7.64(2.13)	7.75(2.09)	7.55 (2.17)	<.001
Note: FAS, family affluence scale. Differences were tested by Chi-square test and Student t-test.				

Table 2 Age group differences on listed measures

	11 years old	13 years old	15 years old	
Variables (scale of measurement)	% or Mean (SD)	% or Mean (SD)	% or Mean (SD)	*p*
Gender				
Boys	35.8%	35.2%	29.0%	
Girls	34.2%	35.0%	30.8%	
Country				
Greece	32.6%	34.2%	33.2%	
Israel	30.3%	35.4%	34.3%	
Italy	34.3%	36.0%	29.7%	
Malta	42.0%	30.5%	27.5%	
Portugal	39.5%	38.7%	21.8%	
Spain	27.8%	36.5%	35.7%	
FAS (0-13)	7.36(2.73)	7.56(2.70)	7.56(2.63)	<.001
Self-perceived health (Good)	90.8%	88.8%	86.2%	<.001
Psychological symptoms (low) (4-20)	14.84(4.78)	13.76(4.57)	13.05(4.57)	<.001

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Physical activity in the last 7 days (0-7)	4.03(2.11)	3.67(2.12)	3.26(1.17)	<.001
Healthy Eating (yes)				<.001
Alcohol use (1-7)	1.26(0.85)	1.74(1.74)	2.83(2.83)	<.001
Family support (4-28)	24.92(5.35)	23.84(5.84)	23.08(6.10)	<.001
Teacher relationship (3-15)	12.54(2.46)	11.40(2.80)	10.86(2.82)	<.001
Peers' relationship (3-15)	12.12(2.45)	11.51(2.64)	11.30(2.63)	<.001
Been Bullied (yes)	26.0%	23.1%	17.1%	<.001
Life satisfaction (0-10)	8.08(2.13)	7.59(2.10)	7.20(2.08)	<.001
Note: FAS, family affluence scale. Differences were tested by Chi-square test and Student t-test.				

Table 3 Linear regression for relationship between life satisfaction and adolescents' behaviours

	Regression coefficients		Standardized coefficients		
	B	Standard error	β	t	p
Gender (male)	-,038	,023	-,010	-1,70	,090
Age	-,083	,008	-,070	-10,64	<.001
FAS	,061	,005	,077	13,18	<.001
Psychological symptoms (low)	,091	,003	,209	32,52	<.001
Self-perceived health	,814	,037	,129	21,75	<.001
Healthy Eating	,157	,027	,034	5,88	<.001
Physical activity	,046	,006	,050	8,29	<.001
Alcohol use	-,023	,007	-,021	-3,20	<.001
Been Bullied	-,298	,030	-,059	-9,94	<.001
Family Support	,073	,002	,212	33,97	<.001
Teacher relationship	,072	,005	,102	15,48	<.001
Peer relationships	,070	,005	,090	13,89	<.001

Note: FAS, family affluence scale

Table 4 Linear regression for relationship between life satisfaction and adolescents' behaviours, by country.

	Greece (R^2=36%)		Israel (R^2=18%)		Italy (R^2=38%)		Malta (R^2=34%)		Portugal (R^2=30)		Spain (R^2=37%)	
	β	p	β	p	β	p	β	p	β	p	β	p
Gender (1 – boy)	-,043	<.01	,006	,730	-,008	,552	-,010	,590	,035	<.01	-,045	<.001
Age	-,093	<.001	-,044	<.05	-,066	<.001	-,108	<.001	-,053	<.001	-,123	<.01
FAS	,050	<.001	,123	<.001	,066	<.001	,075	<.001	,092	<.001	,034	<.001
Psychological symptoms (low)	,185	<.001	,118	<.001	,251	<.001	,226	<.001	,228	<.001	,223	<.001

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Self-rated perceived	,133	<.001	,068	<.001	,142	<.001	,095	<.001	,162	<.001	,145	<.001
Healthy Eating	,038	<.01	,035	<.05	,034	<.05	,011	,559	,039	<.001	,027	<.05
Physical activity	,059	<.001	,065	<.001	,020	,138	,050	<.01	,033	<.001	,056	<.001
Alcohol use	-,025	,138	,003	,858	-,001	,943	-,032	,112	-,050	<.01	,028	,057
Been Bullied	-,055	<.001	-,082	<.001	-,034	<.05	-,058	<.01	-,056	<.001	-,016	,220
Family Support	,230	<.001	,152	<.001	,266	<.001	,243	<.001	,178	<.001	,248	<.001
Relations Teachers	,141	<.001	,103	<.001	,075	<.001	,151	<.001	,092	<.001	,083	<.001
Relations Classmates	,083	<.001	,099	<.001	,123	<.001	,047	<.05	,086	<.001	,099	<.001

Note: β; Standardized coefficients