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PATTERNS OF HEALTH-RELATED BEHAVIOURS AMONG HELLENIC STUDENTS

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Abstract: In recent years health promotion is a matter of great interest among researchers in the field of social sciences. The aim of the present study was to identify patterns of health related behaviours in relation to various demographic and psychosocial variables. Participants were 3307 Hellenic students aged 10 to 16 years. The behaviours that were examined were exercising, fruit consumption, smoking, and violence. Cluster analysis identified four distinct profiles. One profile included students, who exercise regularly and, also, consume fruit, avoid smoking, and violence. A second profile included students, who do not exercise, and, also, avoid smoking, violence, and fruit consumption. A third one in-cluded students, who take part in violent incidents, but exercise and, also, consume fruits and avoid smoking. Finally, a fourth profile included students, who smoke and participate in violent incidents and, also, avoid exercise and consuming fruits. Overall, gender and grade seemed to better explain the presence or absence of healthy behaviours (exercise and diet), whereas family structure, perceptions of family support and family and peer behaviour seemed to better explain the presence or absence of unhealthy behaviours (smoking and violent behaviour). The results of the present study indicate that health promotion programs should take into serious consideration both personal and social characteristics of the targeted population.

Key words: Health behaviours, Health profile, Students.

In recent years the interest of health-related scientific and medical organizations on health promotion is progressively growing. However, despite the increasing focus on health prevention, results from relevant studies show that behavioural patterns are quite worrying, especially among younger populations (Johnston, O'Malley, & Bachman, 2000;

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Steptoe et al., 2002). Since the early nineties, the adoption of unhealthy behaviours like smoking and use of alcohol and drugs seems to have spread rapidly (Torabi & Nakornhet, 1996). Furthermore, low levels of exercise and poor diet, which are related to obesity and have been characterised as potential risk factors for individuals' health, have been detected (Muecke, Simons-Morton, Huang, & Parcel, 1992). Thus, the study of health-related behaviours becomes of great importance especially for younger children and adolescents, since it is at that age when health beliefs are established (Baranowski, 1997) and health related habits are adopted (Taylor, 1999).

The present study is part of a larger project investigating health-related issues in the Hellenic student population. The purpose of the present study was to identify whether patterns of health related behaviours exist among the student population. Of the amount of health related behaviours the present study focused on exercise, diet (fruit consumption), smoking, and violence. Furthermore, the study aimed to examine demographic and psychosocial factors, whose importance in relation to health behaviour has been widely acknowledged, e.g., health beliefs model (Becker, 1974), social cognitive theory (Bandura 1986), and social learning model (Sallis & Hovell, 1990).

In the literature, it has been reported that there are numerous factors influencing exercise participation; however, family and friends are two of the most important factors proposed to account for physical activity (e.g., Brook, Mendelberg, Galili, Priel, & Bujanover, 1999; Herrenkohl et al., 2000). In several studies, children's physical activity has been found to be in accordance to their parents', who are said to influence their children either as models or motivationally (e.g., Anderssen & Wold, 1992; Stucky-Ropp & DiLorenzo, 1993). Furthermore, friends' and older siblings' involvement in exercise is significantly related to children's behaviour (Vilhjalmlsson & Thorlindsson, 1998). However, meta-analysis of studies about the effects of social influences on individuals' attitudes, intention, and behaviour revealed that the influence of important others is stronger than that of family (Carron, Hausenblas, & Mack, 1996).

Regarding healthy eating, parental modeling is considered the major factor in shaping children's behaviour (Lau, Quadrel, & Hartman, 1990). In addition, children living with one of their parents or single and unemployed people have been characterised as at-risk groups (Roux, Le Couedic, Durand-Gasselin, & Luquet, 1999). Finally, nutritional habits

have been shown to be affected by appearance, weight, and peer influence (McLellan, Rissel, Donnelly, & Bauman, 1999).

Regarding smoking, it has been suggested that peer influence is the most influential factor (Roosmalen & McDaniel, 1989). Family influence is also recognised as important (Dusenbury et al., 1992), with mothers having the most significant influence (Griesler & Kandel, 1998). Young children whose parents were smokers have been found to be more tolerant towards smoking compared to the ones whose parents did not smoke, although they knew its consequences (Brook et al., 1999). In other studies (Roosmalen & McDaniel, 1989; Unger & Chen, 1999) it was found that children, whose parents and siblings were smokers, start smoking at an earlier age. Nevertheless, peer influence is claimed to be stronger than parental (Dusenbury et al., 1992) and so is sibling influence (Sugathan, Moody, Bustan, & Elgerges, 1998).

The last behaviour that this study deals with is violent behaviour. Youth violence has been identified as an important public health problem (Dalhberg, 1998). Stiffman, Earls, Dore, Cunningham, and Farber (1996) regarded violence as a core issue on the public health agenda because violence is associated with social problems and the particular youth's mental health. Peer deviant behaviour has been reported as the most important factor predicting violent behaviour (Paetsch & Bertrand, 1997). Moreover, family condition can instill deviant behaviours when the environment is tolerant of such behaviours (Blackson et al., 1999). Family related factors that have been associated with violent behaviour are family malfunctioning, and family separation (Dahlberg, 1998), as well as family conflicts, congruous family relationship, and inadequate children monitoring by parents (Ary, Duncan, Duncan, & Hops, 1999). Importantly, endorsement of aggressive acts has been associated with youth physical activity. Sport participation has been linked to violent behaviour (Papaioannou, Karastogiannidou, & Theodorakis, 2004), and in particular when people aim to win by any means (Dunn & Dunn, 1999; Papaioannou, 1997).

Summarising the above literature, it is well documented that personal and psychosocial factors are important determinants of children's behaviour. Despite the large number of studies investigating health-related behaviours in relation to demographic and psychosocial variables, most studies have examined behaviours in isolation from each other, or have tested relationships between exhibited behaviours. Subsequently,

there is a lack of research examining how such behaviours cluster, that is, how healthy and unhealthy behaviours are combined between them, and further, identifying the profiles of children who exhibit certain behavioural patterns. The identification of such groups would be helpful in recognising intervention target groups, identify characteristics of at-risk groups, and design multi-goal intervention programs.

To extend the existing literature we conducted the present study, which is part of a larger project dealing with the relationships of health-related attitudes and behaviours among students. The aim of the study was first to examine how the behaviours of interest –i.e., exercising, smoking, fruit consumption and participating in violent acts– cluster, that is, how certain behaviours relate to each other; second, to identify the profile of students in these behaviour clusters in relation to demographic characteristics and psychosocial variables.

METHOD

Participants and procedures

Participants in this study were 3307 Hellenic students (1481 males, 1731 females, and 95 non-identified by gender). Their age ranged from 11 to 16 years. The sample was selected with a random stratified sampling method from 37 classes of elementary schools (6^{th} grade, $n = 621$), from 39 classes of junior high school (2^{nd} grade, $n = 699$), from 41 classes of junior high school (3^{rd} grade, $n = 739$), from 37 classes of senior high schools (2^{nd} grade, $n = 734$), and from 31 classes of senior high school (3^{rd} grade, $n = 510$). The schools were selected from 6 urban areas of Greece varying in population from four millions to seventy-five thousands residents.

The study was conducted with the permission of the Greek Ministry of Education. Ten trained research assistants were employed in the data collection process. Students received instructions from the research assistant. They were informed that the questionnaires were anonymous and completed the forms in the absence of their teacher.

Measures

Self-reported behaviours. Four behaviours were assessed by self-reported measures, previously used by Papaioannou et al. (2004). The scales were adopted from previous studies investigating health behaviours

(Kimiecik, 1992; Steptoe et al., 2002) and complied with the guidelines for measurement of behaviour (Ajzen, 2002). In particular, students were asked to indicate frequency of the examined behaviours on six-point scales. For exercising: "How many times did you exercise during the last month?" from 0 = none to 5 = more than twenty times. Participants were instructed that exercise meant taking part in physical activities, which cause increased heart rate and sweating for more than 30 minutes, e.g., football, basketball, or aerobic. For smoking and fruit consumption: "How many cigarettes/fruits you smoked/ate during the last week?" from 0 = none to 5 = more than twenty. For participating in violent acts: "How many times you got involved in violent acts during the last month?" from 0 = none to 5 = more than ten times.

Perceived family and peer behaviour. Family and peer influence was assessed in terms of modelling. The questionnaire was based on prior work regarding family and peer behaviour (Wang, Fitzhugh, Westerfield, & Eddy, 1995), and comprised 16 items assessing perceived parents' and peers' behaviour towards the examined behaviours. More specifically, students were asked what they believed about their parents, siblings, and best friends: "How often do you think your mother/ father/ siblings/ best friend exercised/ smoked/ ate fruits/ participated in violent action during the previous month?" Responses on these items were rated on a 7-point scale, from 1 = never to 7 = all the time. Cronbach's alpha ranged from .65 to .80 (see Table 1).

Table 1. Descriptive statistics for the examined behaviours, perceived family support, and perceived family and peer behaviours

Variables	*M*	*SD*	alpha
Exercise	2.47	1.70	
Smoking	.61	1.52	
Fruit consumption	2.81	1.51	
Violent behaviour	.46	1.23	
Perceived family support	4.70	.95	.86
Perceived family and peer exercise behaviour	3.26	1.18	.68
Perceived family and peer smoking behaviour	2.51	1.29	.61
Perceived family and peer fruit consumption behaviour	4.71	1.28	.80
Perceived family and peer violent behaviour	1.63	1.13	.80

Perceived family support. A 10-item questionnaire was used to assess perceived parental support (Wickrama, Lorenz, & Conger, 1997). The

scale assesses students' perception of their parents' behaviour towards them. For example, students were asked how often during the previous month their parents illustrated their real interest for them, expressed their love and affection to them, were angry with them, and so on. Reponses on these items were rated on a 6-point scale, from 1 = never to 6 = all the time. Cronbach's alpha was .86.

Family structure. To assess family structure, participants were asked to indicate whether they live with both parents, with their mother only, with their father only, with their grandparents, or alone. They also had the choice to state other.

Data analysis

Cluster analysis was chosen to answer the main research question, namely, whether identifiable subgroups or profiles of students would emerge based on variations regarding the behaviours of exercising, smoking, eating fruits and participating in violent acts. The aim of cluster analysis is to identify homogeneous groups based on shared characteristics. A non-hierarchical clustering method was employed (SPSS *K*-means cluster) with the squared Euclidean distance used as the similarity measure. Before submitting the data to the cluster procedures, all variables were converted to *z* scores in order to standardise the measurement scales and to allow the easier interpretation of the results. A *z* value of +/- .50 was used as a criterion for interpreting whether students scored relatively higher or lower compared to their peers on each of the four variables. In addition, *z* values greater/lower than +/- 1.0, were considered as indicative of very high for the respective behaviours.

RESULTS

Descriptive statistics for all variables are presented in Table 1. Mean scores indicate that students scored moderately on exercising and fruit consumption and low in smoking and participating in violent incidents. Furthermore, they scored moderately high on perceived family support and perceived family and peer exercise behaviour, moderately low on perceived family and peer smoking behaviour, moderately high on perceived family and peer eating fruits behaviour, and low on perceived family and peer violent behaviour.

Cluster analysis

Following recommendations regarding cluster analytic procedures (Kachigan, 1991), various cluster solutions were tested before deciding which one was the most appropriate. Thus, three, four and five-cluster solutions were tested. Based on the number of behaviours that were examined, and the formation of the clusters, as those emerged from the analyses, the four-cluster solution was considered the most meaningful. Mean *z* scores, non-standardised means and standard deviations for each of the key variables on which participants were classified into subgroups are presented in Table 2.

Table 2. Mean scores, standard deviations and z-scores for the four clusters

	Cluster 1 (n = 221) Deviant violent profile			Cluster 2 (n = 1272) Deficient health profile			Cluster 3 (n = 382) Deviant smoking profile			Cluster 4 (n = 1432) Mainstream healthy profile		
	M	*SD*	Mean *z*	*M*	*SD*	Mean *z*	*M*	*SD*	Mean *z*	*M*	*SD*	Mean *z*
Exercise	3.38	1.57	.53	1.11	.95	-.80	1.93	1.82	-.31	3.68	1.13	.71
Smoking	.25	.70	-.24	.01	.41	-.34	4.66	.65	2.64	.01	.26	-.38
Fruit consumption	3.15	1.64	.23	2.09	1.20	-.47	2.63	1.77	-.12	3.44	1.37	.42
Violent behaviour	3.53	1.25	2.43	.01	.30	-.33	1.58	1.98	.87	.01	.20	-.45

Cluster 1 comprised 221 students. The unique characteristic of this cluster was very high scores on participating in violent incidents. Students in this cluster also scored high on exercising, moderately on fruit consumption and moderately low on smoking. Cluster 2 comprised 1272 students. The main characteristic of this cluster was the low scores on exercising. Students in this cluster also scored moderately low on fruit consumption, smoking, and violent behaviour. Cluster 3 comprised 382 students. The unique characteristic of this cluster was the very high scores on smoking. Students in this cluster also scored high on participating in violent incidents, and moderately low on exercising and fruit consumption. Finally, Cluster 4 comprised 1432 students. The main characteristic of this cluster was the high scores on exercising. Students in this cluster also scored moderately high on fruit consumption and moderately low on smoking and participating in violent incidents.

In relative terms, students in Cluster 1 were those participating in violent incidents, who however maintain a satisfactory level of exercise,

comparable to that of students in Cluster 4, who were characterised by the adoption of healthy behaviours, and absence of unhealthy ones. Students in Cluster 2, like those in Cluster 4, were characterised by absence of unhealthy behaviours, however their level of exercise was very low, and they also had the lowest scores on fruit consumption. Finally, students in Cluster 3 were those who were smokers, who also had, comparatively, moderate levels of participating in violent incidents and low levels of exercising and consuming fruit. The four clusters were labelled in accordance to their characteristics. The first cluster was labelled "deviant violent profile", the second "deficient health profile", the third "deviant smoking profile", and the fourth "mainstream healthy profile".

Cluster profiles in relation to gender and grade

Percentages of cluster representation within gender are presented in Table 3. Chi square analysis revealed significant within cells differences, $\chi^2(3, N = 3212) = 172.49, p < .01$. The cluster "deviant violent profile" included higher percentage of boys than of girls. In particular, 11.6% of the boys and 2.3% of the girls fall in this cluster, adjusted standardised residuals ± 10.7. The opposite was evident for the cluster "deficient health profile", which included 29.6% of the boys and 46.2% of the girls, adjusted standardised residuals ± 9.6. Gender representation in the clusters "deviant smoking profile" and "mainstream healthy profile" was comparable, adjusted standardised residuals ± 2.5 for both clusters.

Table 3. Percentages of cluster representation within gender and family structure

	Cluster1 Deviant violent profile	Cluster 2 Deficient health profile	Cluster3 Deviant smoking profile	Cluster 4 Mainstream healthy profile
Gender				
Males	172 (11.6%)	439 (29.6%)	190 (12.8%)	680 (45.9%)
Females	39 (2.3%)	800 (46.2%)	173 (10%)	719 (41.5%)
Family structure				
Both parents	180 (6.3%)	1105 (39%)	279 (9.8%)	1271 (44.8%)
One or no parents	32 (7.8%)	147 (35.9%)	93 (22.7%)	137 (33.5%)

Percentages of cluster representation within grade are presented in Figure 1. Chi square analysis revealed significant within cells differences, $\chi^2(12, N = 3303) = 479.18, p < .01$. In the cluster "deviant violent profile" there was no specific pattern regarding representation of different grades,

adjusted standardised residuals -1.5, 1.8, 3.9, 0.1, and –5 for the five grades, from the lower to the higher. In contrast, as it becomes obvious from Figure 1, clear patterns could be observed in the other three clusters. In particular, in the cluster ''deficient health profile'', adjusted standardised residuals -5.7, -4.7, -0.5, 4.9, and 6.4 for the five grades, respectively, and in the cluster ''deviant smoking profile'', adjusted standardised residuals -8.5, -5.6, -2.9, 6.7, and 11.1 for the five grades, respectively, the percentage of membership increased in direct relation with grade. In the cluster ''mainstream healthy profile'' the pattern was opposite with membership decreasing as grade increased, adjusted standardised residuals: 11.8, 7.3, 0.4, -9.1, and –11.0 for the five grades, respectively.

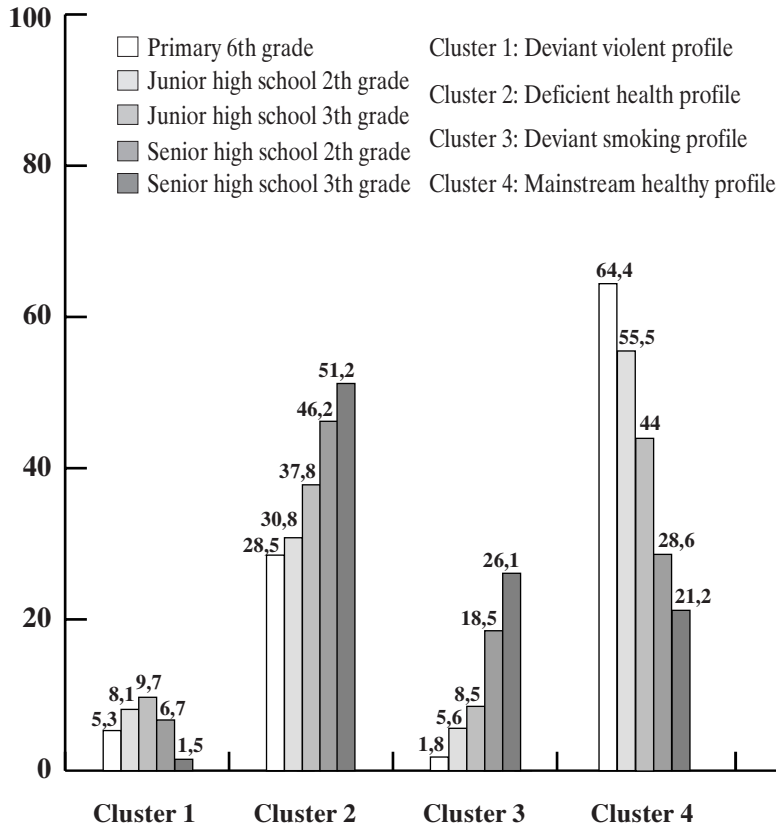

Figure 1. Percentages of cluster representation within grade.

Cluster profiles in relation to family structure

Regarding family structure, due to the vast majority of students living with both parents, participants were regrouped to form two groups, one including students living with both parents ($n = 2835$) and one including students living with one or no parents ($n = 409$). Statistics regarding the distribution of participants into the four clusters in relation to family structure are presented in Table 3. Chi square analysis revealed significant within cells differences, $\chi^2(3, N = 3244) = 64.47$, $p < .01$. Representation in the clusters "deviant violent profile" and "deficient health profile" was similar for students living with both parents and students living with one or no parent, adjusted standardised residuals ± 1.1 and ± 1.2, respectively. In the cluster "deviant smoking profile", there was a higher percentage of students living with one or no parent. In particular, this cluster included 22.7% of students living with one or no parents and 9% of students living with both parents, adjusted standardised residuals ± 7.7. Finally, the cluster "mainstream healthy profile" included 44.8% of students living with both parents and 33.5% of students living with one or no parent, adjusted standardised residuals ± 4.3.

Cluster profiles in relation to perceptions of family support and family and peer behaviour

Analysis of variance was subsequently used in order to examine differences in family support and perceived family and peer behaviour among participants falling into each cluster. The results of the analysis and mean scores for these variables in each cluster are presented in Table 4. One-way ANOVA was applied to test for differences in family support. The analysis revealed a significant univariate effect, $F(3, 2118) = 88.16$, $p < .001$. The highest scores on family support were reported from participants in the cluster "mainstream healthy profile", followed by participants in the cluster "deficient health profile", followed by participants in the cluster "deviant violent profile", whereas the lowest scores were reported from participants in the cluster "deviant smoking profile". Scheffe's post-hoc test revealed that there were significant differences between all clusters. However, given the large cell sizes this was expected. Examination of effect sizes indicated that differences between the clusters "deficient health profile" and "mainstream healthy

profile'' were small and so were differences between the clusters ''deviant violent profile'' and ''deviant smoking profile'', *ES* = .14 and .31, respectively. In contrast, differences between the clusters ''deficient health profile'' / ''mainstream healthy profile'' and the clusters ''deviant violent profile'' / 'deviant smoking profile'' were larger, *ES* ranging from .45 to 1.01.

Table 4. Mean scores on family support and perceived family and peer behaviour for the four clusters

	Cluster 1 Deviant violent profile	Cluster 2 Deficient health profile	Cluster3 Deviant smoking profile	Cluster 4 Mainstream healthy profile	F(1, 2862)	η^2
Family support Perceived family and peer behaviour	4.23 ^{2,3,4}	4.76 ^{1,3,4}	3.94 ^{1,2,4}	4.89 ^{1,2,3}	88,16***	.11
Exercise	3.53 ^{2,3}	2.98 ^{1,3,4}	2.71 ^{1,2,4}	3.70 ^{2,3}	74.54***	.11
Smoking	3.03 ^{2,3,4}	2.35 ^{1,3}	3.63 ^{1,2,4}	2.29 ^{1,3}	76.80***	.11
Fruit consumption	4.52 ^{4}	4.63 ^{3,4}	4.16 ^{2,4}	5.05 ^{1,2,3}	37.14***	.06
Violent behaviour	2.76 ^{2,3,4}	1.36 ^{1,3}	2.26 ^{1,2,4}	1.43 ^{1,3}	100.66***	.14

Note: ***p < .001. ^{1,2,3,4} upper cases indicate differences between Clusters 1, 2, 3, 4, respectively.

A MANOVA was applied to examine differences between participants in each cluster in perceived family and peer behaviour. The analysis revealed a significant multivariate effect, $F(12, 5604) = 52.18$, $p < .001$. Univariate analysis indicated that differences between the clusters existed in all dependent variables. Scheffe's post-hoc test indicated that regarding perceived family and peer exercising behaviour students in the clusters ''deviant violent profile'' and ''mainstream healthy profile'' scored higher than students in the clusters ''deficient health profile'' and ''deviant smoking profile''. Furthermore, it was indicated that students in the cluster ''deficient health profile'' scored higher than in the cluster ''deviant smoking profile''.

Scheffe's post-hoc tests regarding perceived family and peer smoking behaviour revealed that students in the clusters ''deficient health profile'' and ''mainstream healthy profile'' scored lower than students in the clusters ''deviant violent profile'' and ''deviant smoking profile''. Furthermore, students in the cluster ''deviant smoking profile'' scored higher than in the cluster ''deviant violent profile''. Scheffe's post-hoc tests regarding perceived family and peer fruit consumption behaviour revealed that students in the cluster ''mainstream healthy profile'' scored higher

than all the other clusters. Furthermore, students in the cluster "deviant smoking profile" scored lower than in the cluster "deficient health profile". Finally, Scheffe's post-hoc tests regarding perceived family and peer violent behaviour revealed that students in the cluster "deviant violent profile" scored higher than students in all the other clusters. Furthermore, students in the cluster "deviant smoking profile" scored higher than in the clusters "deficient health profile" and "mainstream healthy profile".

DISCUSSION

The adoption of health related behaviours is a matter of great importance in the study of contemporary lifestyle. Children and adolescents are a population of particular interest, since health beliefs adopted in early years are indicative of later behavioural patterns. The present study explored patterns of behaviour among a Hellenic student population and examined demographic and psychosocial factors as likely determinants of such behavioural patterns.

Students' profiles in relation to gender and grade

Students' profiles of health related behaviours were firstly examined in relation to demographic characteristics. The cluster profile results indicate considerable variability among students, which were associated, at least partly, with age and gender. In relation to gender, comparing the clusters "deficient health profile" and "mainstream healthy profile" it becomes evident that among students that avoid unhealthy behaviours, boys are more involved in exercising than girls. Similar findings have been reported by Anderssen and Wold (1992), who found that girls are significantly less active than boys. Comparison of the clusters "deviant violent profile" and "mainstream healthy profile" reveals that among students regularly exercising, there is a greater number of boys getting involved in violent incidents. This result incorporates findings from Paetsch and Bertrand (1997), who found involvement in sport activities being associated to violent behaviour, and findings from Herrenkohl et al. (2000), who reported male gender to be a significant predictor of violent behaviour. Sport is an achievement context where the desire to succeed may lead to 'winning by all means' attitudes (Duda, Olson, & Templin, 1991). In

certain instances, such beliefs have been connected with the adoption of violent acts in sport settings (Dunn & Dunn, 1999). Further, there is evidence that boys are more oriented towards such perceptions of success than girls are (Duda & Whitehead, 2001). Such evidence may justify the identified relationships between gender, physical activity levels, and violent behaviour, and stress the importance of promoting motivationally adaptive environments in achievement sport settings (Papaioannou, 1997). Regarding smoking and fruit consumption there were no differences between boys and girls.

In relation to grade, the patterns that were identified are quite worrying. Older students reported less healthy behaviours and more unhealthy ones, as well, than younger students. Similar results regarding smoking and alcohol use have been reported by Botvin and Kantor (2000) and Johnston et al. (2000), who found that during high school rates of smoking and alcohol use increase rapidly with age. According to the problem behaviour theory (Jessor, 1991; Jessor & Jessor, 1977), problem behaviours are part of normal adolescent development and play a major role in the process of transition to adulthood. Problem behaviours in adolescence can be instrumental in gaining peer acceptance and respect, in establishing autonomy from parents, in confirming for self and significant others certain attributes of identities, in affirming maturity and making a transition out of childhood and toward a more adult status.

Overall, the demographic results of the present study revealed that older students and mainly girls reported lower levels of healthy behaviours, whereas older students and mainly boys reported higher levels of unhealthy behaviours. However, it is also notable that younger students, irrespective of other variables, exhibited healthier profiles. To our view, this finding stresses the need to direct our attention to earlier ages where healthy habits are still dominant and try to improve maintenance of healthier life-style.

Students' profiles in relation to family structure

Family structure was another factor that seemed to influence the adoption of healthy and unhealthy behaviours, especially smoking and exercising. A relatively large percentage of students living with one or no parents are smokers and non-exercisers, and respectively a relatively small percentage of those students are regular exercisers. Regarding aspects of family

structure and its relation to students' behaviour, the findings of this study seem to coincide with existing evidence suggesting that children living in single-parent families are at high risk as far as unhealthy behaviours are concerned (Roux et al., 1999). Sobeck, Abbey, Agius, Clinton, and Harrison (2000) found that it is more possible for smokers to come from families that are not congruous, whereas Dahleberg (1998) reports that among the factors that increase the possibility of violent behaviour are family malfunctioning and family disruption. In a relevant study (Theodorakis, Papaioannou, & Karastogianidou, 2004) students who reported growing up with one or no parent adopted more unhealthy lifestyle attitudes and behaviours (smoking, drug use, violence, exercise, nutrition) than students growing up with both parents. From a sociological perspective, family is an important socializing and supervision agent (Anderson, 2002). In families where one parent is missing children are exposed to lower levels of these types of social control and monitoring (Gottfredson & Hirschi, 1990). Subsequently, children in single parent families are at higher risk of deviant health behaviours.

Students' profiles in relation to perceptions of family support and family and peer behaviour

Finally, students' profiles were examined in relation to perceived family support and perceived family and peer behaviour. The results suggest that family support seems to be an important factor in relation to students' profile. A more careful examination reveals that family support looks more crucial in relation to the adoption of unhealthy, rather than healthy, behaviours. In particular, students who scored higher on family support were those who do not smoke and do not take part in violent incidents ("deficient health profile" and "mainstream healthy profile"). However, students in the cluster "deficient health profile" had the lowest scores on exercising and fruit consumption. Moreover, students who scored lower on family support were those who engage in unhealthy behaviours, such as smoking and violent behaviour ("deviant violent profile" and "deviant smoking profile"), even though they scored higher in exercising and fruit consumption compared to students in the cluster "deficient health profile".

Similar patterns of relationships were revealed regarding perceived family and peer behaviour. Thus, it seems that perceptions of psychosocial variables are more influential in relation to the adoption or not of

unhealthy, rather than healthy, behaviours. In relation to these results, there is evidence that parental monitoring as well as frequent conflicts between parents and children relate to increased smoking among children (Duncan, Duncan, Biglan, & Ary, 1998). Blackson et al. (1999) claim that negatively perceived parental control and psychological dominance are responsible for violent behaviour, while Ary et al. (1999) reported loose parental control to be also related to deviant behaviour.

Overall, some of the patterns that emerged seem interesting and important. In particular, even though clear connection between smoking and non-exercising was detected, the opposite was not evident, that is, no clear pattern between non-smoking and exercising were revealed. This leads us to believe that absence of unhealthy behaviours is not necessarily connected to adoption of healthy behaviours. Furthermore, the relationship between exercising and violence indicates that adoption of healthy behaviours is not necessarily connected to absence of unhealthy behaviours.

At this point two possible limitations of the present study should be acknowledged. First, the assessment of health-related behaviours was based on self-reported single-item measures. The validity of single-item measures has been often questioned. However, in the field of health related behaviours single item measures is often the more accurate way to assess behaviours such as smoking or consuming fruits. Furthermore, such measures are common and widely used in the field. Regarding the reliance on self-reports, given the nature of the study and the large size of the sample this was the only possible way to assess behaviour. In light of these issues, future research could further our confidence on the results and extend our understanding of health related behaviours in young populations employing longitudinal designs, and behavioural assessment through observation, but also reports from parents and teachers. Despite the above limitations the results of the present study provide valuable information regarding health related behaviours and factors that should be considered in the study of young adolescents' lifestyle.

Considering the evidence regarding prevailing lifestyles around the world –e.g., Johnston et al. (2000) for the USA; Steptoe et al. (2002) for Europe; Leslie et al. (1999) for Australia– the need to develop health promotion programs is universally recognised. The results of the present study can prove helpful in developing more efficient health promotion programs. Demographic characteristics and descriptions of social environment can help identify intervention targets. Furthermore, the way

behaviours cluster can help schedule more specific intervention programs in relation to specific groups. For example, a program with emphasis on the importance of exercising in maintaining healthy life style would be more appropriate for individuals who are not smokers but are not physically active. Accordingly, a program emphasising long-term consequences of unhealthy lifestyle and benefits of healthy habits would be more appropriate for inactive individuals who also smoke. Finally, a program designed to promote fair play, respect for teammates and opponents, and avoidance of violence would be more appropriate for physically active children, who however exhibit violent behaviour. Physical education programs represent an important gateway for encouraging young people to develop lifelong habits. Moreover, health-related interventions in schools should focus on eliminating or weakening those aspects of the environment that support or permit engagement in health-compromising behaviours. Finally, with regard to social environment, this should also become part of the intervention programs. School physical education should have a central role in promoting healthy lifestyle. However, a comprehensive approach to health promotion in youth should also involve community organisations, families, health care settings, the media, and other appropriate channels.

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