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Socio-demographics impact of healthy lifestyle in parents with preschoolers: a pilot study

Eirini Chitou[1], Vasiliki Karavida[1], Eleni Tympa[2], Evridiki Zachopoulou[2]
[1]Department of Early Years Learning and Care, School of Social Sciences, University of Ioannina, Ioannina, Greece
[2]Department of Early Childhood Education and Care, School of Social Sciences, International Hellenic University of Thessaloniki, Thessaloniki, Greece

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ABSTRACT

Parents' ability to follow a healthier lifestyle is influenced by their socio-demographic characteristics. This study seeks to assess the lifestyles of preschoolers' parents and discern potential correlations with their demographic attributes. Using a quantitative approach, a pilot study was conducted among 51 parents who actively participated in a survey. To study the extent of parents' adoption of a healthy lifestyle, a 25-question Likert scale questionnaire was employed. Findings revealed a notable prevalence of healthy habit adoption, including a wholesome diet. Furthermore, the results noted a commendable level of parents' knowledge of matters related to healthy lifestyles. Of particular interest was the significant impact of maternal fixed work schedules on the implementation of healthy eating habits, which surpassed the influence of other types of work schedules. Additionally, a direct correlation was observed between information derived from authoritative sources about healthy lifestyles and the educational attainment of parents. More specifically, parents with higher educational attainment tend to be more conscious of healthy living and to actively incorporate a healthy lifestyle into their daily routines. In light of these findings, there is a clear indication that further research into the dynamics of parents' adoption of healthy lifestyles is required.

Corresponding Author:

Eirini Chitou
Department of Early Years Learning and Care, School of Social Sciences, University of Ioannina
4th klm National Road Ioannina-Athens, P.C. 45500, Ioannina, Greece
Email: eirini_chitou@yahoo.com

1. INTRODUCTION

- The importance of parental lifestyle

Numerous public health intervention and promotion programmes have been implemented throughout the world. The interventions that are implemented tend to focus on health education and the provision of guidelines, yet skills training intended for parents remains rather limited. Furthermore, the importance of parents' role in promoting healthy lifestyle habits is underestimated [1]. Such programmes address many of the related problems but often with limited success.

The present study employs a quantitative approach to investigate preschoolers' parents healthy eating habits and the obstacles faced by parents in implementing a healthy lifestyle. This study focuses on parents because it is important to consider their contribution to their child's eating habits and the management of their eating behaviors [2]. Understanding these factors is crucial for designing successful intervention programs targeted at parents of preschoolers. The eating behaviors of 5.5-year-old children are associated with how parents feed them and their concern about the child's weight [2]. Related programs should promote positive,

child-responsive feeding approaches [2]. Children's tendency to imitate adult attitudes highlights the fundamental role of the family environment towards the adoption of a healthy lifestyle by children. Therefore, parents act as role models and mentors for their children by stressing the superiority of healthy habits and contributing to the incorporation of such habits into their daily routine [3].

Various studies suggest that parents' knowledge of healthy living can help children not only to recognise the importance of and adopt healthy eating and exercise, but also to avoid behaviours with detrimental effects on their health, such as smoking [4]. Children growing up in highly educated families have the tendency to consume fewer soft drinks and more foods that are low in monounsaturated fats and high in vitamins. Their diet is rich in whole grains, high-fibre bread, fruits, and vegetables [5]. Furthermore, a positive correlation has been identified between children who consume more vegetables and mothers who have attained a higher level of education [5]. Lower-educated parents are less likely to enforce eating rules at home than higher-educated parents. Thus, the level of parents' education has been associated with the adoption or rejection of healthy eating practices [5]. A qualitative study supports the hypothesis that similar trends can be found among parents of primary school children and adolescents in Greece [6]. Unfortunately, related quantitative studies about parents of preschool children and adolescents in Greece are still missing.

Adoption of a healthy lifestyle is influenced by socioeconomic factors, while a gender-related variation has also been recorded. Such variables highlight the importance of examining how work and family behaviour patterns contribute to health. Multiple jobs, as well as shift and overtime work, restrict parents' ability to participate in family meals [7]. Work-related skills or resources may enhance parents' ability to meet family demands for a healthier lifestyle. Mothers perceive their role and responsibility as catalytic, especially in relation to feeding their children and preparing the family's daily food. In most cultural contexts, mothers have the tendency to spend more time catering for their children and families. Therefore, their attitudes towards eating behaviour are crucial. Previous studies argue that mothers' work schedule is critical for their ability to achieve balance and adapt to the needs of their families [7]. In fact, mothers' flexible work schedules allowed for the evaluation and implementation of daily family eating routines. Optimized eating routines enabled schedule stability for the rest of the family and promoted the adoption of a healthy lifestyle. There are related data about parents of school children in Greece [6], but the available data for parents of preschool children are scarce.

Children aged 4–7 years old at the time of recruitment and living in Navarra, Spain, were the subject of another study [8]. The study confirmed that children whose parents had healthier lunch attitudes were less likely to be affected by micronutrient inadequacy and presented superior adherence to the Mediterranean diet [8]. Additionally, it was witnessed that children whose parents answered positively to the questions in the healthy-eating attitudes index tended to consume more fruits, vegetables, and fish, and less butter and meat [8]. Furthermore, children whose parents demonstrated knowledge of the recommended dietary intakes of various food categories tended to consume appropriate amounts of those food groups [8]. It will be very interesting to see if similar trends are found in Greece and other Mediterranean countries.

- Obstacles to the implementation of a healthy lifestyle

According to the definition of the WHO, a healthy lifestyle is characterised by living in a way that reduces risks of serious illness or premature death [9]. On the other hand, there are barriers to the implementation of a healthy lifestyle. These barriers arise from factors that directly interfere with the acceptance and promotion of healthy habits or reduce the commitment to the plan of action for changing behaviour. In addition, factors that promote the maintenance of a healthy lifestyle are defined as facilitators of a healthy lifestyle [10]. Facilitators mapped to socio-ecological model may include the reality that parents perceive themselves as responsible for preventing child obesity or parental belief that cultivating healthy behaviours should start early in a child's life [11].

Parents' knowledge of healthy living plays a decisive role in the adoption of corresponding practices [12]. Thus, if parents are not interested in healthy eating habits, they may ignore the importance of healthy meals for the promotion of their children's health and protection against health-limiting conditions like obesity [12]. Dalma *et al.* [6] identified barriers to the implementation of a healthy lifestyle in Greece. Their results support the hypothesis that the following factors inhibit the adoption of healthy eating and living habits: i) parents' financial distress, ii) limited time for food preparation, and iii) children's resistance to healthy eating. Unfortunately, these data were extracted from a qualitative study about parents living in a specific region in Greece (Athens). Quantitative results will provide more insight into whether these findings represent the entire Greek population. Furthermore, no relevant data from other regions in Greece can be extracted from published literature.

Another study involved parents of children aged 2-5 years old who discussed external factors that have a negative impact on their family's healthy living. These factors included time, cost, weather, and school [13]. Two primary themes emerged, related to cultural factors. One was the concept of being familiar to a certain lifestyle, and the other was the conflict between social norms and preferences with mainstream culture [13]. It is obscure if cultural factors contribute to parents' eating behaviors in Greece.

Sometimes, barrier themes are time and financial cost, parents' lack of time and energy, influence of family members, and challenges regarding the physical environment [14]. Barriers included beliefs around the need to use rewards to encourage child eating, beliefs around the need for screens as babysitters, and feeling disempowered to change sleep behaviors [15]. Parents of preschool children reported a lack of self-confidence in their ability to encourage healthy eating habits [16]. They mentioned barriers such as food cost, lack of time, personal preferences, eating schedules, and conflicts over food [16]. Some parents also noted a lack of energy and time as barriers to active play with their children, and believed that dietary habits play a significant role in shaping a healthy lifestyle [16]. Typical obstacles to making healthy choices included lack of time, concerns about neighborhood safety, limited knowledge of portion size and cooking methods, and ways to prepare healthy foods or engage in active indoor activities, as well as the perceived expenditure of healthy options and having family members who were picky eaters [16]. It would be very interesting to confirm that the same trend can be found in the Greek population.

On the other hand, employers often tend to underestimate the importance of workplace policies and practices, such as schedules, work breaks, overtime, and shifts, for employee satisfaction. These variables discourage parents from implementing a healthy meal schedule within their families. Schedule flexibility for working mothers and schedule stability for working fathers may encourage healthy eating behaviours among parents [7]. These themes have not been thoroughly investigated for Greek parents.

- Aim of the study

A healthy lifestyle brings about various benefits for human health and has been associated with the prevention of numerous non-communicable diseases; thus, the adoption of healthy habits is of paramount importance [17]-[20]. Adherence to a healthy way of living is extremely important for the prevention of the majority of non-communicable diseases, including type II diabetes mellitus, hypertension, and most serious complications such as cardiovascular-related diseases, and may prove beneficial for mental illness [18]. Various reports have established the link between the adoption of a healthy lifestyle and a healthy status [17]. Rejection of detrimental health behaviours (such as alcohol consumption and smoking addiction) coupled with the adoption of healthy habits (such as healthy meals and daily exercise) may delay the onset of chronic diseases or even contribute to their prevention in the future [18]. Regular physical activity entails benefits for both physical and mental well-being. Physical activity (90 min a week or 15 min a day) is associated with extension of an individual's lifespan and decline of all-cause and cancer-cause mortality [21].

On the other hand, the existence of socioeconomic variances underscores the significance of examining the influence of demographic factors on parents' ability to adopt a healthier lifestyle [22]. Recent studies by Tenjin *et al.* [23] and Wijayaratne *et al.* [24] argue that the family environment (including parents' lifestyle trends) and demographics have a significant impact on the feeding habits of the family as a whole.

The aim of the present study was to investigate the contribution of socio-demographic factors to the implementation of family healthy lifestyles in a Greek population using a quantitative approach (in contrast with a previous study, [6]). The research questions are formulated below: i) To what extent do Greek parents follow a healthy lifestyle? ii) What is the impact of Greek parents' socio-demographic characteristics on the adoption of a healthier lifestyle? This study focuses on parents of preschool children living outside the capital, encompassing a range of socio-demographic characteristics as shown in Table 1 that differ from those in previous research. The analysis has been carefully designed to include additional parameters that have not been thoroughly investigated in the past, such as obstacles related to commuting time and modes of transportation, as shown in Table 2. The research questionnaire, as shown in Table 3, was structured to analyse various parameters, including healthy habits, dietary practices, the ability to maintain a healthy lifestyle, and information sourced from reputable outlets regarding healthy living. The results presented below confirm the hypothesis that the majority of parents adhere to a healthy lifestyle, but there are still many obstacles related to socio-economic factors.

2. METHOD

2.1. Research design

The present pilot study evaluated data derived from parents of preschool children. The decision to follow a quantitative approach [25] was based on the assumption that the dependent variables are measurable using appropriate Likert scale questionnaires [26], which directly evaluate the views of parent participants on healthy lifestyles [27]. The need for a quantitative research design was confirmed by the requirement to assess the impact of socio-demographic factors and to generalize the conclusions for the entire Greek population using inductive statistical methods. Furthermore, the Likert scale is a powerful tool commonly used in questionnaire surveys in education, representing one of the most effective forms of ordinal measurement. Unlike basic closed questions, Likert-scale questions enable researchers to gather richer, more nuanced data, enhancing the quality and depth of their insights [27].

2.2. Sample

The final sample for this pilot study consisted of 51 parents (47 women and 4 men) of preschool children from a region in the Ionian Islands accessible to the researcher. In most Greek urban and rural areas, mothers' contribution to their children's nutritional preferences is typically catalytic, while the father's role is supplementary. This likely accounts for the lower engagement of fathers in filling out the questionnaires. The research included parents of children attending public kindergartens and nurseries, with the children's ages ranging from 3 to 6 years old (the average age of the children was 4.4 years). The schools were selected using random sampling methods. Additionally, the pilot study area was intentionally located far from the main study area to ensure a distinct population for the main study.

Table 1. Parents' demographic profile

Variable	Category	No (%)
Gender	Male	4 (7.8)
	Female	47 (92.2)
Age	25-34	12 (23.5)
	35-44	30 (58.8)
	45-54	7 (13.7)
	>55	2 (3.9)
Marital status	Married – cohabitation	34 (66.7)
	Single	8 (15.7)
	Divorced	9 (17.6)
Father's level of education	Primary educational diploma	1 (2)
	Secondary educational diploma	11(21.6)
	Post-secondary non-tertiary education	7 (13.7)
	Tertiary education	21 (41.2)
	Master/doctorate degree	11 (21.6)
Mother's level of education	Secondary educational diploma	10 (19.6)
	Post-secondary non-tertiary education	7 (13.7)
	Tertiary education	20 (39.2)
	Master/doctorate degree	14 (27.5)
Quantitative variable	Range	AVG S.D
Age	0.25-12.5	4.4 2.8

The questionnaires were distributed to parents in March 2022. Due to the restrictive measures imposed by the COVID-19 pandemic, distributing and collecting the questionnaires proved challenging, even though the schools were open. The recruitment of participants (parents) was based on convenience. It took approximately 1 to 2 months to gather the completed questionnaires. By the end of May, all the completed questionnaires had been collected from the parents. A total of 70 questionnaires were distributed, and 51 were returned fully completed. This number was deemed sufficient for the pilot survey, and no additional questionnaires were collected since it was intended to be a pilot study [28]. The recommended minimum sample size for the pilot study was calculated using three different tests: the kappa agreement test (15 participants), the intraclass correlation test (22 participants) and the Cronbach's alpha test (24 participants) [28]. To account for a 20.0% anticipated non-response rate, the largest required sample size (24 participants, from the Cronbach's alpha test) was divided by 0.8, resulting in a minimum required pilot study sample size of 30 participants [28]. Similar sample sizes (46 participants) have been seen in similar studies using questionnaires to collect data [29]. The pilot study was concluded in May 2022, and no additional participants have been enrolled since that time. The socio-demographic characteristics of the parents are detailed in Tables 1 and 2.

2.3. Measures

The research questionnaire, as shown in Table 3, was structured in two sections. The first section included closed-ended questions in relation to the profile and demographic characteristics of participants. The second section was characterised by closed-ended questions using a five-point Likert scale (from 1 = never to 5 = always), which revealed the lifestyle characteristics of participants. The reliability of this questionnaire was evaluated using the Cronbach's Alpha coefficient. A high reliability score $\alpha = 0.808$, was obtained as shown in Table 4.

The aforementioned questionnaire as shown in Table 3, comprised the following four categories:

i) Healthy habits: This category included ten questions (eight of which examined the implementation of healthy habits and two examined detrimental behaviours). The reliability of the category was satisfactory ($\alpha = 0.746$, Table 4).

ii) Healthy diet: This category comprised nine questions (seven of which evaluated the implementation of a healthy diet, that is, five daily meals and the percentage of healthy daily meals). An additional question was added regarding the use of nutritional supplements. The reliability of the category was also satisfactory ($\alpha = 0.705$, Table 4).
iii) Ability to adhere to a healthy lifestyle: This category involved two questions about participants' ability to adhere to a healthy lifestyle (taking into account their spare time and financial status). The reliability of the category was satisfactory ($\alpha = 0.741$, Table 4).
iv) Information from reputable sources about a healthy lifestyle: This category relied on four questions concerning the extent of participants' knowledge of issues related to a healthy lifestyle. Furthermore, the questions were aimed at evaluating the extent to which such knowledge was sufficient to influence their eating habits, as well as the reputability of information sources. The reliability of the category was satisfactory ($\alpha = 0.755$, Table 4).

Table 2. Parent's professional details

Professional detail	Category	No (%)
Father's professional status	Employee	17 (33.3)
	Self-employed	20 (39.2)
	Contract employment	10 (19.6)
	Part-time employment	3 (5.9)
	Unemployed	1 (2)
Mother's professional status	Employee	22 (43.1)
	Self-employed	4 (7.8)
	Contract employment	16 (31.4)
	Part-time employment	6 (11.8)
	Unemployed	3 (5.9)
Father's working schedule	Full-time schedule (6 hours/8hours)	31 (62.0)
	Part-time schedule	2 (4.0)
	Morning hours	3 (6.0)
	Split schedule	9 (18.0)
	Freelance	5 (10.0)
Mother's working schedule	Full-time schedule (6 hours/8hours)	34 (70.8)
	Part-time schedule	3 (6.3)
	Flexible schedule	1 (2.1)
	Morning hours	3 (6.3)
	Split schedule	2 (4.2)
	Freelance	5 (10.4)
Father's Avg time for transportation from home to work	0-15 min	35 (70.0)
	16-30 min	9 (18.0)
	31-60 min	2 (4.0)
	>60 min	4 (8.0)
Mother's Avg time for transportation from home to work	0-15 min	38 (79.2)
	16-30 min	9 (18.8)
	>60 min	1 (2.1)
Father's mode of transportation from home to work	Walk	9 (18.0)
	Car	29 (58.0)
	Motorcycle	10 (20.0)
	Bus	2 (4.0)
Mother's mode of transportation to work	Walk	13 (28.9)
	Car	28 (62.2)
	Motorcycle	4 (8.9)

2.4. Statistical analysis

Data analysis was performed using the statistical package for the social sciences (SPSS Statistics) version 24 software (IBM, New York, USA). Socio-demographic characteristics are presented as frequencies and percentages, while the dependent variables related to a healthy lifestyle are presented with the mean (AVG) and standard deviation (S.D.) [30]. The effect of demographic and professional factors on dependent variables was evaluated using the independent samples t-test parametric test [30]. The independent samples t-test was used to compare the means of two independent samples in order to determine if their means are significantly different [30]. Additionally, a one-way ANOVA was utilized to compare the means of three or more independent samples [30]. The survey categories were designed using the mean value of the respective questions. Factor normality was tested using the Shapiro-Wilk test [31]. The Shapiro-Wilk test for normality is designed to detect all departures from normality. The null hypothesis of normality was rejected when the p-value was less than or equal to 0.05 [31].

Table 3. Descriptive data and reliability analysis

Variables (α = 0.808)	Avg	S.D.
Healthy habits (α = 0.746)	3.85	0.57
Do you understand the importance and necessity for rest?	4.49	0.70
Do you realize the positive influence of exercise on your health?	4.37	1.02
Can you distinguish between helpful and detrimental activities for optimal heart function?	4.35	0.77
Do you understand the importance and necessity for short breaks during exercise?	4.18	0.84
Do you realize the interconnection between breathing and heartbeat?	4.14	0.87
Do you enjoy participating in physical activities (games, physical exercise, etc.)?	3.92	0.89
Do you prefer to exercise in your spare time?	3.14	1.04
Do you prefer to exercise on a daily basis?	2.80	1.11
Do you prefer to watch television in your spare time [R]?	2.65	1.15
Do you smoke on a daily basis [R]?	2.25	1.65
Healthy diet (α = 0.705)	4.03	0.57
Do you receive lunch on a daily basis?	4.71	0.64
Do you appreciate the value of healthy foods?	4.57	0.70
Do you choose to consume home-cooked food?	4.51	0.76
Do you receive breakfast on a daily basis?	4.04	1.25
Do you receive dinner on a daily basis?	3.96	1.13
Do you receive tithe on a daily basis?	3.67	1.18
Do you receive meal at afternoon on a daily basis?	3.39	1.36
Do you receive dinner after 21:00 p.m. [R]?	3.04	1.23
Do you consume nutritional supplements [R]?	1.55	0.83
Ability to implement a healthy lifestyle (α = 0.741)	3.32	1.01
Is your spare time enough for implementing a healthy lifestyle?	3.35	1.09
Is your income satisfactory for implementing a healthy lifestyle?	3.29	1.17
Information from reputable sources about a healthy lifestyle (α=0.755)	3.53	0.82
Is your knowledge about healthy eating satisfactory in order to influence eating habits?	4.00	0.75
Are you informed about issues related to a healthy lifestyle?	3.92	0.84
Do you get information on healthy lifestyle issues from health professionals?	3.29	1.35
Do you get on healthy lifestyle issues from print - scientific journals?	2.90	1.27

Table 4. Factor normality

Category	W (51)	p-value
Healthy habits	0.968	0.189
Healthy diet	0.970	0.217
Ability to implement a healthy Lifestyle	0.963	0.111
Information from reputable sources about a healthy lifestyle	0.963	0.113

3. RESULTS AND DISCUSSION

The sample in this study was unevenly distributed for a specific socio-demographic factor, with 47 females and 4 males. This is a common problem caused by the methodological constraints of using questionnaires to collect data and has also been seen in similar studies [29]. For example, in one study, most participants were mothers (about 9 out of 10), almost all (about 9 out of 10) were in the same age group (20–44), and nearly all were married (about 9 out of 10) [29]. The majority of participants in the present study were highly-educated (at least tertiary level of education), married (or in cohabitation) women (aged 25–44) with one child (in the majority of cases a boy), as shown in Table 1. Fathers were primarily self-employed or civil servants, while mothers were civil servants or contract workers, as shown in Table 2. In most cases, the parents' work schedule involved full-time employment, with the average time of their transportation from home to workplace being 0–15 minutes and the main means of transportation being the car, as shown in Table 2.

The findings of the study point to a sufficient implementation of healthy habits by the study sample. Parents' adherence to healthy habits was high (AVG = 3.85, Table 3). More specifically, they understood the importance and necessity of rest (AVG = 4.49), they perceived the positive impact of exercise on their health (AVG = 4.37), they were able to distinguish between activities that are either beneficial for or detrimental to optimal heart functioning (AVG = 4.35), they were aware of the importance and necessity of short breaks during exercise (AVG=4.18), they apprehended the relationship between breathing and heart rate (AVG = 4.14,) and enjoyed participating in physical activities (AVG = 3.92), whereas they rarely smoked on a daily basis (AVG = 2.25) as shown in Table 3. On the other hand, a separate study identifies insufficient parental knowledge and time as the primary barriers observed by the parents to improving healthy eating habits among their preschool children [32].

Parental nutrition and physical activity patterns significantly influence the consumption of fruits/vegetables, junk food, and the level of sedentary behavior in preschool-age children [33]. A cross-sectional study enrolled parents of four-year-old children [34]. Children whose parents perceived their diet as nutritious

consumed more fish, shellfish, and vegetables and fewer soft drinks, fats, oils, and confectionery than children whose parents perceived their diet as poor [34]. Our participants reported considerable adherence to a healthy diet, as they had lunch on a daily basis, they recognized the value and significance of healthy eating behaviors, and preferred to consume home-prepared meals. Additionally, they frequently had breakfast and dinner daily, while they rarely took nutritional supplements. Parents' adherence to a healthy diet was high (AVG = 4.03, Table 3). Participants almost always received lunch daily (AVG = 4.71), they appreciated the value of healthy food (AVG = 4.57), and preferred to consume home-prepared meals (AVG = 4.51), as shown in Table 3. Additionally, they consumed a complete breakfast (AVG = 4.04), dinner (AVG = 3.96), and midday meal (AVG = 3.67) daily, while they never or rarely took nutritional supplements (AVG = 1.55), as shown in Table 3. Parents were inclined to adopt a healthy lifestyle to a moderate extent (AVG = 3.32), depending on the sufficiency of time (AVG = 3.35) and income (AVG = 3.29), as shown in Table 3. These findings are further validated by existing literature [35]. Results based on a prospective population-based cohort confirm that preschool children (4 years old) who frequently skipped meals, such as breakfast, had lower diet quality than those who did not [35]. Likewise, preschool children (4 years old) with less frequent family meals had poorer diet quality compared to those who ate with their families daily [35]. These findings suggest that regular family mealtime routines in early childhood (preschoolers) may support better overall diet quality at the future [35]. This survey further highlights our proposed link between healthy nutritional habits and parental influence [35].

Participants' knowledge of the implementation of a healthy lifestyle was sufficient in our study. Their knowledge positively influenced their eating habits. This study revealed a moderate to high level of parents' access to authoritative sources of information on a healthy lifestyle (AVG = 3.53) as shown in Table 3. Parents reported that their knowledge about healthy nutrition was sufficient to influence their eating habits (AVG = 4.00) and that they were informed about issues related to a healthy lifestyle (AVG = 3.92) as shown in Table 3. The link between knowledge of healthy lifestyles, recognition of the importance of healthy eating behaviours and exercise, and adoption of these practices is also supported by published data [33]. Parents who had superior nutrition knowledge had elevated scores for actively promoting fruit and vegetable consumption [33].

The highest knowledge status (concerning healthy living) was observed among highly educated parents (at least a tertiary level of education) in our study. The One-Way ANOVA test confirmed a statistically significant deviation between fathers' ($p = 0.043$) and mothers' ($p = 0.036$) ability to acquire information on healthy lifestyles from reputable/authoritative sources, depending on their level of education. The results of the present study highlighted (among other facilitators) the significance of knowledge of nutrition issues when it comes to adopting a healthy lifestyle. Accordingly, Wijayaratne *et al.* [24] also have reported an association between guardians'/caregivers' desire to provide a proper and balanced diet for their household and the level of their nutrition literacy.

In our study, highly educated fathers (postgraduate-doctoral level) (AVG=3.98) were statistically more likely to acquire information from reputable sources ($p = 0.012$) than the corresponding group of lower-educated fathers (secondary education level) (AVG = 3.13), as shown in Table 5. Furthermore, they have highlighted the barriers that prevent them from fulfilling such a goal. These findings are confidently supported by established literature. A cross-sectional survey (which was conducted among parents of preschool children in Chongqing, China) revealed that fathers' education level was associated with children's eating behaviours [36]. As a result, our findings are backed by similar evidence from other countries. The eating behaviours of preschool children in Chongqing are also closely related to family factors, such as children's age, mother's occupation, forced eating behavior, and parents' perception of children's body shape [36]. Similarly, mothers' lower educational attainment (secondary education level) (AVG = 2.95) was associated with a statistically lower impact ($p = 0.010$) on their ability to acquire information from authoritative sources of information on healthy lifestyles, compared to the corresponding ability of highly-educated mothers (tertiary level of education) (AVG = 3.72), as shown in Table 5. Additional studies further support our results. Mothers with advanced nutrition knowledge belonging to more highly educated groups had higher scores related to food preferences [33]. Parents with higher education status who had superior nutrition knowledge were more aware of salted and sugary food avoidance [33]. The study confirmed that mothers with superior education (those with greater nutrition knowledge) had significantly higher scores across the different dimensions assessed [33]. Low-income mothers of preschoolers without higher education often fail to recognize commonly consumed foods (such as processed fruit juices, fried foods, traditional Mexican dishes, or foods with sour cream and cheese) as unhealthy [37]. Having analysed different social and cultural factors, parents' educational level is a critical parameter in relation to both healthier eating patterns and knowledge of food and nutrition. It was observed that older parents and those with higher education drank significantly fewer sugary drinks [33]. Therefore, parents' educational level is a critical parameter confirmed by the present study and multiple independent studies from different countries.

The independent samples t-test confirmed statistically significant average divergences in the implementation of healthy habits according to fathers' ($p = 0.018$) and mothers' ($p = 0.040$) work schedules as shown in Table 5. More specifically, the impact was statistically higher on fathers with a full-time (or morning

hours) work schedule (AVG = 3.99) than on those working part-time, having a flexible work schedule or working as freelancers (AVG = 3.59) as shown in Table 5. A trend of superior implementation of healthy habits was observed in another study with families where fathers worked a fixed, full-time or morning shift [7]. This study also supports the hypothesis that a non-fixed work schedule raises barriers to the desire of both sexes to fulfil the demands of a healthier lifestyle [7]. Our findings do not support this conclusion and further highlight the importance of both factors.

Table 5. Influence of demographic and occupational profile on the adoption of a healthy lifestyle

Demographics	Categories	Healthy habits	Healthy diet	Ability to adopt a healthy lifestyle	Information from reputable sources about a healthy lifestyle
Father's education level	Secondary educational diploma (N = 12)	3.65 (0.62)	3.89 (0.65)	2.92 (1.18)	3.13 (0.77)
	Post-secondary/tertiary education (N = 28)	3.93 (0.57)	4.06 (0.55)	3.48 (1.01)	3.53 (0.82)
	Master-Ph.D. (N = 11)	3.86 (0.51)	4.10 (0.55)	3.36 (0.74)	3.98 (0.72)
		p = 0.367	p = 0.619	p = 0.269	p = 0.043
Mother's education level	Secondary educational diploma (N = 10)	3.94 (0.64)	3.94 (0.61)	3.70 (1.18)	2.95 (0.70)
	Post-secondary/tertiary education (N = 27)	3.89 (0.52)	4.01 (0.60)	3.28 (1.08)	3.72 (0.75)
	Master-Ph.D. (N = 14)	3.71 (0.64)	4.13 (0.50)	3.14 (0.69)	3.57 (0.90)
		p = 0.546	p = 0.722	p = 0.395	p = 0.036
Father's working schedule	Full-time schedule -Morning (N = 34)	3.99 (0.52)	4.10 (0.56)	3.28 (0.98)	3.61 (0.83)
	Part-time-flexible-split-Freelance (N = 16)	3.59 (0.58)	3.84 (0.54)	3.31 (1.05)	3.31 (0.81)
		p = 0.018	p = 0.138	p = 0.914	p = 0.237
Mother's working schedule	Full-time schedule-morning (N = 37)	3.84 (0.57)	4.10 (0.57)	3.18 (1.04)	3.59 (0.79)
	Part-time-flexible-split-Freelance (N = 11)	3.88 (0.60)	3.70 (0.47)	3.68 (0.82)	3.41 (0.91)
		p = 0.835	p = 0.040	p = 0.146	p = 0.527
Father's avg time for transportation from home to work	0-15 min (N = 35)	3.88 (0.52)	4.11 (0.46)	3.51 (0.94)	3.52 (0.74)
	>15 min (N = 15)	3.83 (0.68)	3.78 (0.72)	2.77 (0.94)	3.50 (1.03)
		p = 0.792	p = 0.111	p = 0.013	p = 0.934
Mother's avg time for transportation from home to work	0-15 min (N = 38)	3.78 (0.55)	4.08 (0.55)	3.45 (1.02)	3.49 (0.77)
	>15 min (N = 10)	4.12 (0.57)	3.73 (0.62)	2.70 (0.75)	3.78 (0.58)
		p = 0.092	p = 0.090	p = 0.036	p = 0.323
Mother's mode of transportation from home to work	Walk (N = 13)	3.89 (0.72)	3.92 (0.72)	3.81 (0.88)	3.50 (0.80)
	Car-motorcycle (N = 32)	3.81 (0.53)	4.06 (0.53)	3.06 (1.01)	3.58 (0.87)
		p = 0.669	p = 0.499	p = 0.025	p = 0.780

Similarly, the impact was statistically higher on mothers with a full-time (or morning hours) work schedule (AVG = 4.10) than on those who worked part-time or as freelancers or had a flexible work schedule (AVG=3.70) as shown in Table 5. There are various studies that support our conclusion and reveal significant links between a mother's work status and both physical activity and dietary habits [3], [22]. Additionally, there was evidence suggesting that the mother's work status influences the relationship between one or more aspects of the home food environment and the two dietary outcomes. A sufficient degree of implementation of a healthy diet was correlated with mothers' fixed working hours (that is, full-time or morning). Additional studies confirm the correlation of parents' fixed work schedule with the adoption of a healthier lifestyle by the entire family. Mothers with a stable work schedule are more eager to adapt to their families' needs and adopt a healthy lifestyle. Furthermore, scientific evidence suggests that parents' eating habits (e.g., not skipping meals and consuming home-prepared food) exert a positive impact on children's eating behaviors [3], [22]. Mothers who were able to control their work hours, whether or not they worked long hours, found it easier to allocate time for leisure activities and tended to have a healthier diet more often. On the other hand, other factors seem to be more critical in participants in a study that consisted of 256 parents with children aged 2 to 5 years [38]. The study uncovered a negative correlation between parents' overall stress levels and adherence to a healthy diet [38]. It indicates that individuals under stressful conditions may tend to select energy-dense foods with excessive sugar and fat [38].

In terms of the adoption of a healthy lifestyle depending on commute time (that is, time spent traveling from home to the workplace and vice versa), the independent samples t-test confirmed statistically significant differences between fathers (p = 0.013) and mothers (p = 0.036) as shown in Table 5. Specifically for fathers, spending less than 15 minutes on commute (AVG = 3.51) had a statistically higher impact on adopting a healthy lifestyle, as opposed to an average commute time exceeding 15 minutes (AVG = 2.77) as shown in Table 5. Accordingly, the impact on adopting a healthy lifestyle was statistically higher among mothers who spent less

than 15 minutes on commute (AVG = 3.45) than among mothers whose average commute time exceeded 15 minutes (AVG = 2.70), as shown in Table 5.

The independent samples t-test showed statistically significant differences in terms of mothers' adoption of a healthy lifestyle depending on their means of transportation to work ($p = 0.025$), as shown in Table 5. Mothers who preferred walking to work (AVG = 3.81) were statistically more likely to adopt a healthy lifestyle than the corresponding group of mothers who opted for a car or motorbike (AVG = 3.06), as shown in Table 5. Dalma *et al.* [6] support the conclusion that workplace proximity (average commute time of up to 15 minutes) accounted for a critical factor towards parents' confidence in their ability to adopt a healthy lifestyle. This view was even more pronounced among mothers who commuted on foot. The opposite trend was observed among working mothers who, due to a lack of time, were unable to prepare healthy meals and follow a healthy lifestyle [6]. The significance of commute time has often been overlooked in studies, and relevant information remains limited in the published literature.

Participants in our study showed moderate ability to generally adhere to a healthy lifestyle, mainly due to financial and time limitations. Dalma *et al.* [6] support our conclusion that financial difficulties and limited spare time are the two major obstacles to the adoption of a healthy lifestyle by Greek parents. An additional study also showed a notable positive correlation between household income and parental dietary self-efficacy scores [39]. Parents of preschool children (aged four to under six) reported not always having time to participate in activities. Parents who had at least one child aged 2 to under 6 years felt they lacked the time to fully act on their increased self-efficacy and implement behaviours effectively [40]. They have little time and energy to engage in physical activities and prepare healthy meals for their children. Parents' low socioeconomic status, which results in the inability to afford healthy foods, is one of the conclusions of our study and a commonly reported (in the literature) parental barrier to supporting their children's physical activity and healthy eating [37], [39]. On the other hand, other studies suggest that parents of 2 to 5-year-old children may experience variations in parental self-efficacy due to factors such as cultural background [41]. Cultural risk factors for unhealthy eating habits among children have been identified in families of Latin origin, where parents may misperceive obesity in children as an indicator of good health [41]. Excessive exposure to digital media, including television and smartphones, is associated with increased advertising of unhealthy foods and may significantly contribute to the development of unhealthy eating habits in children [41]. Feeding difficulty has also been reported by parents of preschool children (4 to 6 years old), and this obstacle is typically associated with their own feeding preferences [42]. Another descriptive-correlational, cross-sectional quantitative study identified parental age group as the sole sociodemographic factor associated with parents of preschool-aged children attending kindergarten. Older parents implement stricter dietary restrictions than younger parents, and these restrictive attitudes exert a greater influence on their children's eating habits [29]. Anyway, our conclusion that parental socio-economic status influences various habits, including the consumption of healthy foods (such as vegetables, fish, and nuts, as well as the avoidance of fast food and the preference for bakery products at breakfast) is supported by various abovementioned studies [33], [37], [39].

A limitation of the present study lies in the definition of what constitutes a healthy diet. For the purposes of our study, a healthy diet was defined as having five meals daily and appreciating the value of healthy eating and home-prepared food. This definition, however, does not take into account the exact nature (in terms of quality and quantity) of what participants of this research consumed and how they prepared/cooked such meals at home.

4. CONCLUSION

The findings of the present study confirm the high degree of adoption of healthy habits and a healthy diet among preschool children's parents, whose knowledge of related topics is deemed satisfactory. However, the results of the present study also highlight that the prospect of adopting a more holistic healthy lifestyle is mitigated by income and time constraints, which are partially offset by the proximity of participants' workplaces. The results uncover that parents with a fixed work schedule were significantly more prone to adopting a healthy lifestyle and diet. Furthermore, the results suggest that parents with higher educational attainment were better informed about issues pertaining to the benefits of a healthy lifestyle. All in all, it is deemed necessary to conduct further research in the future, involving a larger sample of individuals, so that conclusions can be generalized to the entire Greek population. There is also a need for a thorough comparative analysis of future results from urban and rural areas in Greece, which will allow us to understand regional differences more clearly. Furthermore, it is essential to validate the findings of the current study by cross-referencing them with similar research conducted across various regions of Greece that exhibit differing living standards. Engaging with parents from diverse socio-economic backgrounds, including those from minority and immigrant communities, will provide invaluable insights. Lastly, expanding this research to include parents of children from various age groups, teenagers, and children with special needs, will enrich our understanding and contribute significantly to the overall study of the topic.

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Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Eirini Chitou	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Vasiliki Karavida	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓
Eleni Tympa	✓	✓		✓						✓			✓	
Evridiki Zachopoulou	✓	✓		✓						✓			✓	

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

ETHICAL APPROVAL

The survey has been approved by the ethical committee of the University of Ioannina and the municipality where the preschool settings belong. The researchers collected data using the convenience sampling method with parents of preschool children who attended preschool education in the city of Corfu (Ionian Islands). Participating parents were informed beforehand about the aim of the study, their anonymity, and voluntary participation, and gave their consent.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [EC], upon reasonable request.

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BIOGRAPHIES OF AUTHORS

Eirini Chitou is a Ph.D. student at the Department of Early Years Learning and Care at the University of Ioannina, Greece. Her areas of research involve the healthy lifestyle of parents with preschool children. She can be contacted at email: eirini_chitou@yahoo.com.

Vasiliki Karavida obtained a master's degree in special educational needs at the University of Newcastle upon Tyne, UK, in 2000, and a Ph.D. in childhood obesity at the University of Ioannina, Greece, in 2016. She is an associate professor at the Department of Early Years Learning and Care at the University of Ioannina, Greece. Her areas of research involve nutrition, healthy lifestyle, education, preschool learning environment, and all-around development in early childhood. She can be contacted at email: vkar@uoi.gr.

Eleni Tympa obtained a master's degree in mother and child health at the University of London, UK, in 1994, and a Ph.D. in risk factors for iron deficiency in childhood at Harokopio University of Athens, Greece, in 2004. She is an assistant professor at the Department of Early Childhood Education and Care at the International Hellenic University, Greece. Her research focus is on the healthy lifestyle of preschool children, the role of storytelling on the healthy lifestyle, pretend play and art activities, and their contribution to the child's development. She can be contacted at email: eltympa@ihu.gr.

Evridiki Zachopoulou is a professor at the Department of Early Childhood Education and Care at the International Hellenic University of Thessaloniki, Greece. Her research focus is on the implementation of movement programs and physical activity, the professional development of early childhood educators, and the evaluation of the quality of early childhood education. She can be contacted at email: ezachopo@ihu.gr.