

Proceeding Paper

Relationships between Mothers' Food- and Physical Activity-Related Habits and Level of Preschoolers' Food Literacy and Motor Skills in Disadvantaged Urban Areas: The Training-to-Health Project [†]

Garden Tabacchi , Luca Petrigna *, Giuseppe Battaglia , Giovanni Angelo Navarra, Antonio Palma  and Marianna Bellafiore 

Sport and Exercise Sciences Research Unit, Department of Psychology, Educational Science and Human Movement, University of Palermo, Via G. Pascoli 6, 90144 Palermo, Italy; tabacchi.garden@libero.it (G.T.); giuseppe.battaglia@unipa.it (G.B.); giovanniangelo.navarra@gmail.com (G.A.N.); antonio.palma@unipa.it (A.P.); marianna.bellafiore@unipa.it (M.B.)

* Correspondence: luca.petrigna@unipa.it

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Abstract: Objectives. The practice of physical activity (PA) and correct food choices since pre-school age can help in obesity prevention and that of other chronic disorders. In this process, mothers have an important role, but the relationship with their children's lifestyle is still unclear in disadvantaged areas. The aim of this study is to explain the extent to which maternal food habits and PA level predict food-related aspects and PA practice in preschoolers from disadvantaged urban areas. Methods. It is a cross-sectional study. A total of 79 dyads of mothers and children were recruited from kindergartens. A questionnaire was compiled by mothers to collect data on: family socio-demographic aspects; mothers' and children's dietary intake frequencies, PA/sedentariness, weight and height; mothers' perception on children's food intake, children's food literacy (FL) and Quotient of Gross Motor Development (QGMD). Results. The following associations were discovered: mothers' and children's food habits (beta = 0.66, $p < 0.001$); mothers' and children's fruit/vegetables consumption (OR 16.2, 95% CI 4.68–59.77), and intake of the other items (sugar and carbonated drinks, confectioned sweet and savory snacks, ready meals, breakfast); mothers' education or PA level and children's FL (beta −0.25, $p < 0.05$; beta 0.25, $p < 0.05$, respectively); mothers' PA or sedentariness and children's QGMD (beta 0.26, $p < 0.05$; −0.21, $p < 0.1$, respectively); mothers' BMI and food habits (beta −0.19, $p < 0.05$) and children's BMI (beta 0.04, $p < 0.05$); education and food habits (beta −0.34, $p < 0.05$). Mothers did not correctly perceive their children's BMI, PA practicing and food intake ($p < 0.05$). Conclusions. To delineate the global path of the relationships between mothers' and children's lifestyles in disadvantaged urban areas can be useful to planning effective interventions aimed to help children and families in maintaining their healthy habits which suddenly changed during COVID-19 pandemic.

Keywords: mother; preschooler; food habits; physical activity; association; disadvantage



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1. Introduction

Parents influence their children's lifestyle from the pre-school age and the monitoring of food choices [1], sedentary behavior and physical activity (PA) practiced [2] is fundamental in the prevention and management of obesity and other chronic conditions later in life. A correlation exists between the quality of children's diet and their parents' food choices [3] but also between parents' and children's PA [4]. Lifestyles and behaviors could be determined by the family socio-economic (SE) status. Furthermore, healthy choices

and correct lifestyles are related to “health literacy”, a concept referring to environmental, political and social aspects determining health [5].

Some data exist in the literature analyzing how parental lifestyle can determine preschoolers’ behaviors. Thus, the aim of the present study is to investigate the extent to which maternal food habits and PA level predict food-related aspects, PA practice and gross-motor development in pre-school children attending kindergartens from low SE level urban areas.

2. Methods

This is a cross-sectional study conducted within the *Training-to-Health* Project [6]. Participants were recruited within kindergartens placed in disadvantaged boundaries of the Palermo City Council. The SE level of the school areas was evaluated through the “index of socio-economic disadvantage” [7]. A total of 87 of 100 parents accepted to participate by signing their informed consent (response rate 87.0%) and they were all mothers. Those who refused reported they were not available to provide private information.

They were asked to self-compile a properly developed questionnaire; 6 responses were excluded as they were not completed, and for 2 children data were not collected due to school absence and incomplete assessment, respectively. Finally, data were obtained for a total of 79 dyads of mothers and children aged 3–6 years. The questionnaire administered to mothers was composed of items to assess lifestyle and socio-demographic aspects. Mothers’ and children’s frequencies of dietary intake were assessed. The different categories of intake were grouped in binary variables, which encompassed low and medium/high frequencies. Mothers were also asked about the duration of breastfeeding of their children.

PA and sedentariness were assessed by asking the number of days in a week when they performed at least one hour of PA, and the daily hours of standing in front of video/PC. Mothers were also asked about their perceived amount of children’s food intake (little, fair, too much) and perceived children’s weight status (under, normal, a little overweight or too much overweight).

Mothers self-reported their weight and height, and, after BMI was calculated, classes of weight status were obtained according to the BMI cut-offs from the CDC [8]. Weight and height of children were measured within the schools, and categories of weight status were assessed through the BMI cut-off values according to gender and age from Cole et al., 2000 [9]. Information on mothers’ education level (none, primary, secondary low, secondary high, university) and occupation (none, part-time or full-time) was collected. The Food Literacy Assessment Tool (preschool-FLAT) [10] and Quotient of Gross Motor Development (QGMD) test [11,12] were used to assess the food literacy (FL) score and motor skills of children, respectively.

Sample characteristics were calculated in numbers and percentages. Means and standard deviations (SD) were used for normally distributed continuous data. Differences between mothers’ and children’s intake frequencies were estimated through paired T-test for the food habit score, and through the chi-squared test for the single food items. The Chi-squared test was used also to estimate the difference between perceived and measured variables. To assess the association between food-related aspects a logistic regression was performed.

Statistical significance was accepted at $p < 0.05$. The STATA/MP 12.1 software (Stata Statistical Software, StataCorp LP: College Station, TX, USA) was used for the statistical analysis.

3. Results and Discussion

Characteristics of the 79 dyads of mothers were: height: 1.6 (0.06) m; weight: 65.3 (10.86) kg; BMI 24.2 (3.71) kg/m²; PA 2.2 (1.91) h/week. Three quarters of the mothers had low education, and around half of them were not employed (46.8%). Characteristics of the children participating in the Training-to-Health Project were as follows (46.8% female; 53.2% male;

height 1.07 (0.06) m; weight 19.2 (2.49) kg; BMI 16.8 (1.95) kg/m²; PA: 2.4 (1.79) h/week; QGMD 123 (15.39); FL score: 12.5 (4.56); breastfeeding 2.7 (1.96) months).

The following associations were analyzed: mothers' and children's food habits; mothers' and children's fruit/vegetables consumption, and intake of the other items (sugar and carbonated drinks, confectioned sweet and savory snacks, ready meals, breakfast); mothers' education or PA level and children's FL; mothers' PA or sedentariness and children's QGMD; mothers' BMI and food habits and children's BMI; education and food habits (Table 1). Mothers did not correctly perceive children's BMI, PA practicing and food intake ($p < 0.05$).

Table 1. Food-related aspects of the 79 dyads of parents and children.

Mother vs. Children	Odds Ratio	95% Confidence Interval
Fruit/vegetables consumption	16.2	4.68–59.77
Sugar and carbonated drinks	34.0	6.34–322.87
Confectioned sweet and savory snacks	11.1	2.25–104.78
Ready meals	25.6	6.65–107.04
Breakfast	17.9	2.17–147.90
Other associations	beta	p values
Mothers' and children's food habits	0.66	$p < 0.001$
Mothers' education or PA level and children's FL	0.25 −0.25	$p < 0.05$
Mothers' PA or sedentariness and children's QGMD	0.26 −0.21	$p < 0.05$ $p < 0.1$
Mothers' BMI and food	−0.19	$p < 0.05$
Mothers' BMI and children's BMI	0.04	$p < 0.05$
Habits education and food habits	−0.34	$p < 0.05$

Note: Food literacy: FL; Physical activity: PA; Quotient of Gross Motor Development: QGMD.

In this period, to know the role of the mothers on their children health is even more important considering that the SARS-CoV-2, so called COVID-19, is the cause of a decrease in quality of PA and an increase in sitting time, of an unhealthy diet (in terms of type of food, eating out of control, snacks between meals and the number of main meals) [13], of mental well-being and psychological health [14] and that anxious mood due to the virus' impact also worsens the eating habits [15].

The present study also shows that children's FL, which is an important component of health literacy, depends on mothers' education and PA practice. Thus, it is suggested that children from high-educated mothers have more incentives and motivation in developing better motor and emergent literacy skills [16]. Anyway, the literature suggests that the parent's role is important in promoting their children's motor competences and skills [17,18] and it is probable that a mother that practices more PA influences her children habits in favor of a more active childhood.

4. Conclusions

This study adds data to the literature regarding the relationships between mothers' and children's lifestyles in low SE urban areas. Moreover, our results can be useful to plan effective interventions to promote healthy lifestyles, which have become increasingly difficult to achieve during the COVID-19 pandemic.

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Institutional Review Board Statement: The study was approved by the Ethical Board of the University of Palermo (N. 2/2018) and it is conformed to the Declaration of Helsinki (Trial Registration: NCT03454061 retrospectively registered 2 March 2018).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Because the participants were also minor, parents or legal guardians provided their informed consent to participate in the research.

Data Availability Statement: Data used during the current study are available from the corresponding author on reasonable request.

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Conflicts of Interest: The authors declare no conflict of interest.

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