

Research Article

Factors Influencing Parental Purchase of Fruits and Vegetables

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Abstract

One strategy to prevent weight gain in children and adolescents is to consume more fruits and vegetables since most fruits and vegetables have low energy density. However, intake of fruits and vegetables among children and adolescents in the United States is below the recommended level. The aim of the present study was to identify factors that influence parent/guardian decisions when purchasing fruits and vegetables. An eight-item survey assessed the purchasing behaviors of fruits and vegetables of 233 parents/guardians of third and fourth grade students of four schools in a U.S. mid-western city. Results indicated family likes and dislikes was the most influential factor in purchasing decisions. This was followed by taste and child likes and dislikes. Cost was ranked fifth after nutrition. Nutrition education should focus on changing family food preferences to include more fruits and vegetables.

Background

Cost is often cited as a limiting factor for consumption of fruits and vegetables. Cost of food plays a significant role in purchasing decisions of consumers [9-11]. There is evidence that healthier food choices are more expensive than less healthy food choices [9,12,13]. The United States Department of Agriculture's Economic Research Service found that low-income households spend \$3.59 per person weekly on fresh fruits and vegetables. In contrast, households with higher-income spend \$5.02 per person weekly on produce [14]. Data from the National Health and Nutrition Examination Survey 2001-2002 showed that households with an annual income of more than \$25,000 consumed an average of 5.56 servings of fruits and vegetables a day, whereas households with less than \$25,000 consumed 5.04 servings a day [15]. Drewnowski and Specter (2004) stated that in families with a restricted budget, healthier food choices such as fruits and vegetables may be overlooked in favor of less-healthy options. Other factors that have been correlated to low consumption of fruits and vegetables are low socio-economic status, limited accessibility to fresh fruits and vegetables, high-spoilage rates, perceived lack of time for preparation of cooking vegetables, and lack of self-efficacy [16-18].

Other studies have examined factors that promote consumption of fruits and vegetables. Availability and accessibility of fruits and vegetables in addition to taste were consistently and positively linked to consumption of fruits and vegetables among children aged 6-12 years [19]. Other factors that were somewhat positively associated with consumption of fruits and vegetables were knowledge of recommended intake of fruits and vegetables, and parental fruit and vegetable intake [19]. Availability and accessibility are in turn dependent on what is being purchased. A cross-sectional study conducted by Mushi-Brunt et al. [20] examined the link between food spending behaviors and consumption of fruits and vegetables among children. Consumption of fruits and vegetables by children at home was primarily dependent on the availability and parental purchasing choices [20]. Cost was also cited as a barrier for consumption of fruits and vegetables as snacks [20]. Consumption of fruits and vegetables was less in households that perceived purchase of fruits and vegetables contributed to an overall increase in cost of groceries [20].

A substantial number of studies in the United States have examined monetary issues related to purchase of healthful foods [9,21-25]. However, research has not focused on the factors that determine purchase of fruits and vegetables by parents/guardians.

Parents ultimately determine the availability and accessibility of food in household [26]. Hence the purchasing decisions of parents/guardians will greatly influence if and what kind of fruits and vegetables are available in the household.

Methodology

Study Participants

The study participants were parents/guardians of third and fourth grade students. Four schools were randomly selected from eight within one U.S. mid-west school district. Out of 475 surveys that were distributed, 233 parents/guardians returned the surveys.

As seen in Table 1, a majority of the participants were female (83%) and white (90%). Marital status was categorized as single, married, separated, and divorced. A majority (80%) of the respondents were married. Educational level of respondents was categorized as having a high school diploma or less, some college, 2-year college degree and 4-year college degree or higher. Nearly half (48%) of the participants had either some college or 2 year college degree education.

Characteristic	Category	N	%
Gender	Male	39	17
	Female	193	83
Race	White	20	90
	Non-white	23	10
Marital status	Single	17	7
	Married	185	80
	Separated	5	2
	Divorced	25	11
Education	High school diploma or less	27	12
	Some college	58	25
	2 year college degree	53	23
	4 year college degree or higher	94	40

Table 1: Demographic Characteristics of the Parental Respondents.

As a proxy for income, the percentage of students who were eligible for free and reduced price lunch was tabulated. According to the National Center for Educational Statistics data for 2006-2007, in school one 13% were eligible for free lunch and 4% for reduced price lunch. In school two, 29% were eligible for free lunch and 14% for reduced price lunch. In school three, 23% were eligible for free lunch and 8% for reduced price lunch. In school four, 32% were eligible for free lunch and 11% for reduced price lunch.

Procedures

The survey was developed after a review of literature which

identified factors that influence food choices [14, 20,27-31]. The survey questions were designed specifically to identify factors influencing the purchase of fruits and vegetables within the household. The survey was pretested with ten parents of similar background as the participants. After feedback and some modifications, the survey was finalized to be used for the study. Besides demographic information such as race, gender, marital status, and education level, the participants ranked what influenced their purchasing decisions in regard to fruits and vegetables from the following eight options - 1) taste, 2) family likes and dislikes, 3) children’s likes and dislikes, 4) nutrition, 5) cost, 6) availability, 7) convenience, and 8) other factors.

The survey packet was distributed in class by the class teacher. Students were asked to bring the survey packet back to school. Participation in the study was voluntary; however, each student, who returned the survey packet to school (either complete or incomplete), received a sticker. The returned survey forms were collected by the researchers from the study schools. The study was approved by the University Institutional Review Board (IRB) and the school district.

Data Analysis

Using SPSS version 17.0 (SPSS, Inc, Chicago, IL), data related to purchasing decisions of parents/guardians were analyzed. The Kendall’s W test was used to determine ranking of factors that influence decisions of parents/guardians when purchasing fruits and vegetables. ANOVAs were used to determine the ranking of factors among different groups defined by education level, race, and marital status in regard to purchasing decisions of fruits and vegetables.

Results

The main objective of this study was to determine the factors that determine fruit and vegetable purchase of consumers with young children. A survey questionnaire was returned by 233 parents/guardians of students in third and fourth grade, and this was used to measure patterns of fruits and vegetables purchase.

Ranking of Factors That Influence Purchase

The parents/guardians were asked to rank in order of preference, from 1 to 8 (1 indicating the most important and 8 indicating the least important), the factors they considered while purchasing fruits and vegetables. Kendall’s W test results showed family likes and dislikes as the leading factor for purchase of fruits and vegetables (Figure 1). This was closely followed by taste and child’s likes and dislikes. Kendall’s coefficient of concordance was 0.51, which is midway between complete agreement and no agreement among the various factors that influence purchase of fruits and vegetables $p < .05$. This also means that there were significant differences

among the rankings of the eight factors that influence purchase of fruits and vegetables.

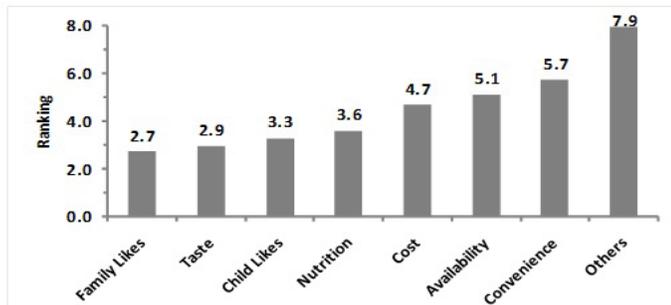


Figure 1: Ranking of Factors of Purchasing Decisions of Fruits and Vegetables with the Lowest Number Being the Most Influential.

Because the rankings of the variables family likes and dislikes, taste, and child likes and dislikes were very similar, a new composite variable was formed by taking the average of rankings of the three variables. The new composite variable of family likes and dislikes, taste, and child likes and dislikes was compared with the cost factor to determine if these factors were significantly different. Kendall's W test results did not indicate much agreement in how parents ranked family likes and dislikes, taste and child likes and dislikes as a group versus cost (0.19); although the p-value was significant $p < .05$. Kendall's W test was also conducted to test for differences in the rankings of family likes and dislikes, taste and child likes as a group versus nutrition. Results did not indicate much agreement in how parents ranked family likes and dislikes,

taste and child likes and dislikes as a group and nutrition (0.04); although the p-value was significant $p < .05$. This indicates that parents ranked family likes and dislikes, taste, and child likes and dislikes as a group more important than either nutrition or cost.

Education and Factors Influencing Purchase of Fruits and Vegetables

The relationship between educational level and the purchasing decisions of fruits and vegetables by parents/guardians was examined using a series of ANOVAs. Results indicated that overall, family likes and dislikes and child likes and dislikes were considered as the most important factors for purchase of fruits and vegetables across most educational levels; however taste was ranked most important for respondents who had high school diploma or less. Nutrition ranked third for both those with a high school diploma or less and those with a 4 year college degree or more. Nutrition was not among the three leading factors for purchasing fruits and vegetables among those with some college or a 2 year college degree. Again, cost was not one of the three leading factors when parents consider fruit and vegetables purchases.

Results (Table 2) showed that family likes and dislikes, as the only factors that differed in ranking across different educational levels in regard to purchase of fruits and vegetables. It is interesting to note that cost was ranked sixth both among respondents who had a 4-year college degree or higher as well as those having a high school diploma or less.

Factors	High school diploma or less Mean SD	Some college Mean SD	Some college Mean SD	4 year college degree or higher Mean SD	F-statistic	P-value
Family likes	3.70 1.94	2.78 1.67	2.57 1.31	2.57 1.65	3.16	0.03
Taste	2.61 1.82	2.93 1.65	3.24 1.65	2.83 1.47	1.05	0.37
Child likes	3.22 1.65	3.16 1.83	3.02 1.63	3.49 1.67	0.95	0.42
Nutrition	3.48 2.04	3.53 1.70	4.06 1.82	3.38 1.71	1.62	0.19
Cost	5.00 1.91	4.57 2.13	3.90 2.20	5.03 2.09	3.28	0.02
Availability	4.52 1.66	5.26 1.36	5.27 1.71	4.85 1.48	2.07	0.11
Convenience	5.65 1.58	5.62 1.45	5.61 1.58	5.83 1.47	0.33	0.82
Others	7.83 0.65	7.98 0.13	8.00 0.00	7.89 0.72	1.06	0.37

Table 2: Educational Level and Factors Influencing Purchase of Fruits and Vegetables.

Race and Factors Influencing Purchase of Fruits and Vegetables

Results from a series of ANOVAs showed family likes and dislikes to be the only significant variable, $F(1, 215) = 18.42$, $p < .05$, that was related to race. Results indicated that family likes and dislikes were ranked as the leading factor for purchase of fruits and vegetables among participants who were white. Family likes and dislikes were ranked higher than taste among participants who were white, whereas, taste was ranked higher than family likes and

dislikes among non-white participants.

Marital Status and Factors Influencing Purchase of Fruits and Vegetables

A series of ANOVA tests were done to analyze the relationship between marital status and the eight factors influencing fruits and vegetables purchase. Test results showed child likes and dislikes, $F(2, 214) = 4.92$, $p < .05$, and availability, $F(2, 214) = 3.14$, $p < .05$ as the only factors that differed in rank across marital sta-

tus groups in relation to purchase of fruits and vegetables. Results showed that family likes and dislikes was the leading factor for purchase of fruits and vegetables among participants who were married or divorced. However child likes and dislikes was the third leading factor for purchase of fruits and vegetables among participants who were married and the second leading factor for purchase of fruits and vegetables among participants who were divorced. Availability of fruits and vegetables was ranked sixth across all marital status groups. In all the three categories of marital status, taste, family likes and child likes were the three leading factors that determined purchasing decisions of fruits and vegetables. Cost was not a leading factor in any of the categories.

Discussion

Recognizing the factors that determine purchasing decisions may help to develop intervention strategies that focus on improving consumption of fruits and vegetables. Mushi-Brunt and colleagues (2007) [20] indicated intake of fruits and vegetables among children and their parents is related to grocery spending behavior. Although previous studies have highlighted the impact of cost on dietary pattern, few studies have examined other factors that determine purchasing decisions of parents/guardians regarding fruits and vegetables.

Cost was often identified as a leading barrier for purchase of fruits and vegetables and healthy eating [9,21-25]; however, in the present study, cost was not a leading factor that was considered when purchasing fruits and vegetables. It was ranked fifth overall among the factors that were considered while purchasing fruits and vegetables. Family likes and dislikes were identified to be the leading factor in the purchasing decisions of parents/guardians regarding fruits and vegetables.

Results of the present study are in line with an earlier finding by Steward, Harris, and Guthrie (2004) [32] who indicated that household characteristics such as the presence of children played a more determining factor than cost as to what kind of vegetables were consumed and presumably purchased by the family. Earlier studies have also indicated familial influence as one of the important factors that determined healthful eating [16,18,30]. Results of the present study indicated that family likes and dislikes were ranked as the leading factor for purchase of fruits and vegetables among participants who were white.

The results of the present study have several implications. High cost of fruits and vegetables is a commonly cited reason for not consuming the recommended amount of fruits and vegetables [33]. However, Blisard et al. (2004) [34] found that an increase in income among lower income households did not necessarily lead to an increase in the amount of fruits and vegetables purchased. Blisard et al. (2004) [34] found that nutrition education played a greater role in purchasing fruits and vegetables in comparison to

income. The results of the present study may also imply that if purchasing of fruits and vegetables is influenced by factors unrelated to costs, lowering the price of fruits and vegetables may have little effect on availability and consumption within households.

Future intervention programs should focus on educating families on how to include more fruits and vegetables in the daily diet. Other approaches may include increasing exposure to a wide variety of fruits and vegetables [35]. Exposure will likely change family preferences of fruits and vegetables. Some other approaches could be to involve children in planning and planting a kitchen garden, helping in the purchase and preparation of foods that include fruits and vegetables, and educating parents and children about the health benefits of fruits and vegetables. A study conducted by the Economic Research Service of the U.S. Department of Agriculture found that consumers with higher nutritional knowledge consumed more vegetables [14].

The parents/guardians should be made aware of various community and web-based resources about fruits and vegetables. Parents/guardians can have a major influence on the consumption of fruits and vegetables by being positive role models and introducing different kinds of fruits and vegetables to the household. Research had indicated that repeated exposures to unfamiliar foods resulted in increased liking and consumption [35]. This may be particularly relevant in case of children with high levels of neophobia and those who are less inclined to eat certain types of foods particularly fruits and vegetables. The results of the present study indicate that family likes and dislikes, taste, and child likes and dislikes were the leading factors that were considered. In this situation, cost may not play a major role.

Monsivais and Drewnowski (2009) [36] observed that higher-quality diets were consumed by people with higher educational level. Maternal education is said to be related to provision of fruits and vegetables in households [37]. In the present study, taste was one of the leading factors that influenced purchasing decisions across most educational categories. Association between marital status and factors determining purchasing decisions of parents/guardians was also examined. In the present study, family likes and dislikes was the leading factor that influenced purchase of fruits and vegetables among participants who were married as well as divorced.

The study had some limitations. One limitation was lack of racial/ethnic diversity in the study sample. Approximately 90% of the study population was white. However, the racial makeup is similar to the city's population. Although roughly one-third of the students qualify for free lunch or reduced price lunches it was difficult to draw any conclusion about SES level and purchasing decisions of fruits and vegetables by parents/guardians. Future studies should include SES variables and a more diverse population. The results of the present study also indicated that ranking of factors

such as taste, family likes and dislikes, and child likes and dislikes are very similar and overlapping. Future studies may combine these three factors in to one category.

Conclusions

Overall, the findings of the study indicated that family likes and dislikes played a leading role in the purchasing decisions of fruits and vegetables across educational levels, marital status, and racial categories. Nutritional knowledge is generally considered as an influencing factor for purchase and consumption of fruits and vegetables. However, in the present study nutrition was not a leading factor overall that was considered when purchasing fruits and vegetables.

Future studies may use assessment measures to effectively assess level of nutritional knowledge and correlate it with factors determining purchasing decisions of parents/guardians in regard to fruits and vegetables. The results of the present study may have implications on interventions and programs that focus on increasing the consumption of fruits and vegetables. Future programs should focus the family as a whole for health-promoting interventions. Family can be considered as a major determinant for promotion of positive health behavior. It provides opportunities to communicate and practice positive health behavior and help change attitudes and behavior of family members. Future intervention studies should focus on educating parents/guardians on introducing fruits and vegetables within the household. Tak et al. (2008) [38] found that liking of fruits, parental facilitation of vegetables, family rules of eating vegetables and availability of vegetables at home to be potential determinants for fruit and vegetable intake.

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