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Determinants of parenting practices related to monitoring sugar sweetened beverages among Hispanic mothers

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Abstract

Background —The purpose of this study was to evaluate Hispanic mothers ($n=238$) of 2–5 year old children and determinants of their monitoring practices related to their preschooler's consumption of sugar-sweetened beverages (SSB).

Methods —Hispanic mothers were recruited from numerous areas (i.e. churches, community agencies, and daycares) in southwest Oklahoma City. Constructs of the Reasoned Action Approach (RAA) were evaluated along with demographic questions.

Results —Most mothers (92%) were born outside the US, and a majority had been in the US 11 years (61%). The RAA constructs autonomy, capacity (or self-efficacy), and descriptive norms predicted a significant amount of the variance of SSB monitoring practices (14.7%).

Discussion —Results show that public health interventions that promote maternal monitoring practices related to SSB for Hispanic mothers should focus on promoting capacity, autonomy, and norms. Such interventions can take place in community centers, clinics, and day cares.

Keywords

Childhood Obesity; Hispanic Health; Health Disparities; Reasoned Action Approach

Background

Obesity disproportionately impacts the Hispanic community, compared to other racial and ethnic groups. To illustrate, in the United States while 23% of all preschoolers (2–5 years) are either overweight or obese (85th BMI-for-age percentile) and 8.9% are obese (95th BMI-for-age percentile), for Hispanic preschoolers, 30% are either overweight or obese, and 15.6% are obese [1, 2]. Preventing obesity during childhood is a complex public-health issue, that should leverage multiple levels within the ecological model. For instance, while interventions are needed to predispose and encourage healthy behaviors at the intrapersonal level through one-on-one counseling and group-level educational programs, members of the community also need healthy living environments to reinforce and enable healthy decision making. Likely the most critical target for public health interventions for preschoolers lies within the interpersonal level. Characteristics of the family, such as interactions centered

around food and the home environment, are essential for shaping the health and well-being of children during their formative years [3].

Sugar-sweetened beverage consumption is among the top behaviors that has been shown to contribute to the development of obesity, especially in Hispanic communities [4]. Epidemiological evidence shows SSB are the largest source of added sugar among children and adolescents in the US (31.8%), and for Mexican Americans, is the second largest source of food energy (i.e. calories) (6.3% of total daily caloric intake), only surpassed by *Mexican Mixed Dishes* (11.4% of total daily caloric intake) [5, 6]. Recent data from the National Health and Nutrition Examination Survey (2011–2012) also shows preschoolers (ages 2–5 years) consumes on average 97 calories from sugared drinks daily, while only 9.2% of Hispanic children (6–11 years) currently meet recommendations for having 0 daily servings of SSBs [4, 7].

Theoretical/conceptual framework

The Theory of Planned Behavior (TPB) has prominence as one of the most utilized theories in the social and behavioral sciences. In a recent review of the literature by a 24-member expert advisory group, it was found that there are 83 theories applied in the field of behavior change, of which the TPB was found to be the second most utilized [8]. Evidence also shows the TPB is an effective framework for health behavior change interventions, as reported in a recent meta-analysis which showed TPB-based interventions had on average a weighted effect size (d^2) of 0.50 [CI (.24, .75); $p < 0.05$] [9]. The Reasoned Action Approach (RAA) is the most recent adaptation of the Theory of Planned Behavior (TPB), and like the TPB, posits that one's behavior is primarily determined by their intentions (or an individual's readiness to engage in a particular behavior), as long as they have sufficient skills to perform the behavior, and the environment is conducive towards performing the behavior [10]. In turn, one's intentions are determined by their attitudes (feelings of favorableness towards a behavior), perceived norms (normative pressure to enact a behavior) and perceived behavioral control (PBC) (the perception of the degree to which a person is capable of and has control over performing a behavior) [10].

Preschoolers are highly dependent upon their parents for consuming a healthy diet, as during these formative years parents have a high level of control over making health related decisions for them that can persist into childhood, adolescence and adulthood. It is therefore critical to understand the behavioral and social cognitions that lead parents towards monitoring SSB during this developmental time, because such information can be foundational for future public health interventions. The purpose of this study was to evaluate theory-based determinants of Hispanic mothers of preschoolers (2–5 years old) towards monitoring their children's intake of SSB, using the theoretical framework of the Reasoned Action Approach.

Methods

Data Collection

This was a cross-sectional study, and all data were collected in early 2015. Surveys were administered in person, via one-on-one interviews with a bilingual researcher. Hispanic mothers were recruited from numerous settings in the community (i.e. churches, community agencies, preschools, and daycares) in five zip codes in the southwest part of Oklahoma City where a majority of the Hispanic population resides. Recruitment strategies included the use of media (TV, radio, and newspaper advertisements), fliers, and a lay community health worker visit to recruitment sites to attract Hispanic families with 2-to-5-year-old children.

Participants

Overall, 238 Hispanic mothers of preschoolers participated in this study. The mean age of the sample was 33.1 years (± 6.4), and for their children it was 3.8 years (± 1.1). Obesity rates were high as almost half of the mothers were obese (41%) and slightly over a quarter of their children were obese (26%). Most of the mothers (92%) were born outside of the US and a majority had been in the US at least 11 years (61%). Additionally, almost all of the mothers (80%) spoke only Spanish or Spanish better than English at home. Over half of the mothers in this study were unemployed, and 73% attained a high-school education or less.

Measures

Details about the Reasoned Action Approach instrument (i.e. item wording, scoring and psychometrics) can be found elsewhere [11]. In short, the instrument was deemed valid and reliable after evaluating forms of validity (face, content and construct) and reliability (internal consistency). The behavior the RAA constructs were directed towards was to “Make sure my preschooler does not drink sugary beverages (Kool-Aid®, Capri-Sun®, Soda, Tampico®)” (Spanish translation as it appeared on the instrument - Asegurarme de que mi hijo(a) no beba bebidas azucaradas (Kool-Aid®, Capri-Sun®, Soda, Tampico®). Each construct of the RAA was evaluated on the behavior (intentions, attitudes, injunctive norms, descriptive norms, capacity and autonomy), and scales were normalized to -2 to +2 by taking the mean of the items in the scale [i.e. indicating a strong negative attitude (-2) to a strong positive attitude (+2)].

Acculturation was also assessed using three questions: number of years of residence in the U.S., place of birth, and the language participants generally read and speak in the home (response options: only Spanish, Spanish better than English, Both equally, English better than Spanish, and only English) [12]. All of the instruments used for this study were initially created in English and translated into Spanish. The protocol for translating the instruments from English to Spanish followed Marin’s double translation methodology [13].

Analysis

This research study was conducted in accordance with prevailing ethical principles and reviewed by an Institutional Review Board (IRB #BLINDED). Step-wise multiple regression was utilized to evaluate the theory-based determinants of intentions and the maternal monitoring of SSB. In the first round of regression, the dependent variable was intentions,

and the independent variables were the core RAA constructs (attitudes, injunctive norms, descriptive norms, capacity and autonomy). In the second round of analysis, the dependent variable was maternal monitoring of SSB, and the independent variables were intentions, capacity, and the autonomy. Finally, in a third round of analysis, the dependent variable was again maternal monitoring of SSB, however in addition to intentions, capacity, and autonomy, attitudes and descriptive norms were added as independent variables, given the new evidence that suggests they have the potential to directly influence behavior, in addition to influencing behavior indirectly through intentions [14]. For all regression models, the inclusion criteria for independent variables were set at an alpha equal to 0.05, and exclusion from the model was set an alpha of 0.10. These values were based on the F-ratio, which is based on the R^2 change statistic. The highest Pearson's r -value determined the order for inclusion of the independent variables for each regression equation. All analyses were performed with SPSS Version 25 data analysis software.

To assure enough participants were recruited for the study a power analysis was conducted using expected effect sizes for the RAA. Recently, a meta-analysis [14] reported the expected effect sizes of constructs within the RAA, and using smallest effect [autonomy to behavior ($r=0.189$)], a sample of at least 134 was determined adequate [G-power: using the following criteria: effect size ($f=0.10$), alpha (0.05), power (80%) and five predictor variables].

Results

Table 1 reports the mean and standard deviation of the days of maternal monitoring of SSB, along with the RAA constructs. On average, mothers reported monitoring their children's consumption of SSB almost 4 days per week (3.7 days). With regards to the RAA constructs, parents' scores were mostly towards the mid-range of each scale.

In the first regression model, autonomy ($b=.483$, $SE=.102$, $p=.001$; $\beta=.290$), injunctive norms ($b=.191$, $SE=.059$, $p=.001$; $\beta=.196$), and capacity ($b=.128$, $SE=.064$, $p=.046$; $\beta=.124$) were significant predictors, that explained 15.1% of the variance of intentions. Attitudes and descriptive norms were not found to be a significant predictor of intentions, thus was not included in the final model.

For predicting maternal monitoring of SSB, capacity ($b=-.771$, $SE=.143$, $p=.001$; $\beta=-.338$), and autonomy ($b=.599$, $SE=.230$, $p=.010$; $\beta=.163$) were significant predictors that explained 11.1% of the variance of the behavior. For the second regression model, only descriptive norms was significant, adding an additional 3.6% to the total variance (14.7% total variance) (Table 3).

Discussion

The purpose of this study was to evaluate theory-based determinants of Hispanic mothers of preschoolers (2–5 year old) towards monitoring their children's intake of SSB. Results from this study showed that by applying a strong theoretical model, the RAA appears to be robust and helpful for understanding maternal practices related to monitoring SSB. According to the final regression models the core RAA constructs predicted 14.7% of the variance of the

maternal monitoring behavior, as well as 15.1% of the variance of intentions. Concurrently, autonomy, capacity, and injunctive norms primarily predicted intentions, and capacity, autonomy and descriptive norms primarily predicted the maternal monitoring of SSB. To put these results into practical recommendations for behavior change interventions, it is important to first differentiate motivational process, or those that help individuals create favorable intentions towards performing a behavior, and implementational processes, or those that help people act upon their intentions [9]. From our results and others that point to capacity and autonomy as being the primary determinant of intentions and monitoring, we suggest that interventions should focus on implementational processes [9]. In a recent meta-analysis on TPB/RAA based behavior change interventions, the most utilized implementational processes were increasing skills, planning, goal-setting, and self-monitoring [9].

Besides implementational processes, since autonomy was the strongest predictor of intentions, interventions should also focus on environmental changes. To understand factors that influence mothers' autonomy, it is recommended that environmental frameworks be utilized as a community planning tool, such as the Social Determinants of Health framework (SDoH). The World Health Organization defines SDOH as "the conditions in which people are born, grow, live, work and age circumstances that are shaped by the distribution of money, power and resources at global, national and local levels" [15]. In addition, the U.S. Healthy People 2020 initiative further distinguishes SDOH into 5 key areas, including (1) neighborhood and built environment (social/environmental factors in one's local community), (2) health and health care (aspects related to access to healthcare), (3) social and community context (social cohesion, and civic participation), (4) education (including literacy and health literacy), and (5) economic stability (availability of financial resources for health related matter) [16]. In the case of Hispanic mothers of preschoolers, a SDOH framework should be further studied to understand which factors play a role in shaping Hispanic mothers' autonomy for promoting healthy lifestyles to their children, such as poverty, education, and the built environment.

Results from this study are different compared to others that have used the TPB and RAA for predicting parental decision making. In one study, the TPB was used to predict factors that influenced mothers' decisions about ensuring their preschooler (4–5 years old) participated in physical activity (PA) and limit screen time [17]. Researchers explained more variance of intentions [73% (PA) and 78% (screen time)] and the monitoring behavior [38% (PA) and 53% (screen time)] with the core TPB constructs, but the sample from this study was from Australia, and was mostly working (54.5%) and educated (50.3% college educated) mothers. In another study using the RAA to predict parental monitoring of SSB of older children (7–12 years) results showed that intentions, skills, and the home environment predicted 28.5% of the variance of parental monitoring while attitudes, injunctive norms, and PBC explained 56.3% of the variance of intentions [18]. Again, the sample differed from this study significantly, as both mothers and fathers were recruited, and the sample was mostly white (84.8%), and educated (31.9% had a Bachelors Degree or higher). It has been documented that income plays a large role in diet patterns. Using combined data from the 1999 to 2008 National Health and Nutrition Examination Surveys (NHANES), researchers showed that adults from lower-income households were more likely to consume highly

palatable/low nutrient dense foods such as salty snacks and sugar-sweetened beverages, and less likely to consume vegetables compared to food-secure households [19]. The differences illustrated here might indicate that traditional theories of behavior change (like the TPB) are not as easily adapted for immigrant and minority groups, that differ in income and economic status than the populations that were studied to develop these theories.

Results from this study also showed a direct relationship between descriptive norms and the maternal monitoring behavior (Table 3). In the genesis of the RAA, *descriptive norms* were included in the model, since it was determined that the TPB was missing a dimension of normative influence towards behavior. As Fishbein and Ajzen note [10], while injunctive norms are an individual's perception of how important people in one's life wants them to engage or not engage in behaviors, another type of social pressure includes an individual's perception of whether others are in fact engaging or not engaging in the behavior. Initially descriptive norms were thought to be a primary determinant of behavioral intentions, however in a recent meta-analysis on the RAA [14], it was hypothesized that this construct could also be a direct determinant of behavior through modeling individual and group performances. This is a major cornerstone of Albert Bandura's theory, Social Cognitive Theory, which posits individuals will not only behave through reinforcement patterns (i.e. systematically considering rewards and punishments), but through observational learning and imitation. This has also been demonstrated in the literature, specifically related to youth SSB consumption and parental modelling. In a recent systematic review, parental modelling was found as a consistent significant factor related to lower SSB intake in young children [20]. Results from our study suggest that mothers are more likely to monitor their preschoolers SSB intake, if they see other mothers monitoring their preschoolers SSB intake. This association has not been well documented in previous research, and future studies should further examine this linkage.

This study is not without limitations, and the following should be considered when interpreting our results. First, all of the responses were based on self-reported data, therefore participant's responses may have been biased, untruthful or incorrect. Further, participants may have misinterpreted questions and provided erroneous answers that could introduce error in our measurement models. Second, the sample used for this study was from a convenience sample of Hispanic mothers in Oklahoma City therefore the results from this study may not be generalizable to other racial and ethnic groups. Finally, the study had a cross-sectional design, thus it is premature to make any implications of cause and effect relationships between the variables under investigation.

New Contribution to the Literature

In conclusion, while it is well known that many factors influence the decisions parents make to feed their children, such as parenting style, socio-economic status, knowledge, and the home environment, researchers note that more investigations related to *how* parents monitor their child's dietary intake is needed [21, 22]. Furthermore, the main focus of much research in this area is related to how feeding behaviors are associated with dietary intake or the weight status of children, rather than the determinants of *why* parents monitor their child's dietary intake. This study is one of the first to use the RAA to explore theory-based

determinants of the behavior “Make sure my preschooler does not drink sugary beverages” which can be used to create foundational work to establish targets for public health interventions. Additionally, while research in this area has been done with mostly Caucasian, affluent families, this is the first study to investigate low-income, Hispanic mothers. In the next phase of research for this study, intervention strategies and behavior-change techniques will be assessed and linked to the significant theory-based constructs of the RAA identified in our results. For example, intervention strategies and behavior-change techniques should focus on enhancing mothers’ capacity to provide healthy drinks to their preschoolers.

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Table 1:

Means and standard deviations of IBM core constructs.

Theoretical Construct	Possible Minimum-Maximum	Observed Minimum-Maximum	Mean (SD)
Maternal Monitoring of SSB	0 to 7	0–7	3.68 (2.46)
Intentions	–2 to +2	–2 to +2	1.26 (1.12)
Attitudes	–2 to +2	–2 to +2	–0.23 (1.36)
Injunctive Norms	–2 to +2	–2 to +2	–0.49 (1.14)
Descriptive Norms	–2 to +2	–2 to +2	–0.61 (1.17)
Capacity	–2 to +2	–2 to +2	–0.70 (1.08)
Autonomy	–2 to +2	–1 to +2	1.32 (0.67)

*
Note: SSB (Sugar Sweetened Beverage)

Table 2:

Parameter Estimates from the Final Regression Model for Intentions as Predicted by Attitudes, Injunctive norms, descriptive norms, autonomy, and capacity: (Adjusted $R^2 = 0.151$) (n=238)

	Unstandardized coefficients B	Std. error	Standardized coefficients Beta	t	p-value
Constant	0.802	0.166			
Autonomy *	0.483	0.102	0.290	4.745	0.001
Injunctive norms *	0.191	0.059	0.196	3.242	0.001
Capacity *	0.128	0.064	0.124	2.007	0.046

* Note: Descriptive Norms and Attitudes not added to final model ($p > 0.05$)

Table 3:

Parameter Estimates from the Final Regression Model for SSB as Predicted by Intentions, autonomy, and capacity (Model 1); and Intentions, autonomy, capacity, attitudes and descriptive norms (Model 2): (Model 1: Adjusted $R^2 = 0.111$; Model 2: Adjusted $R^2 = 0.147$) (n=238)

	Unstandardized coefficients B	Std. error	Standardized coefficients Beta	t	p-value
<u>Model 1</u>					
Constant	2.351	0.371			
Capacity *	-0.771	0.143	-0.338	-5.399	0.001
Autonomy *	0.599	0.230	0.163	2.607	0.010
<u>Model 2</u>					
Constant	2.558	0.369			
Capacity *	-0.854	0.142	-0.374	-6.008	0.001
Descriptive Norms *	0.422	0.128	0.201	3.288	0.001
Autonomy *	0.593	0.225	0.161	2.635	0.009

* Note: SSB (Sugar Sweetened Beverage).