* Manuscript (Including Abstract, References and Figure Legends)

Abstract

Background: Risk taking is a significant health-compromising behavior among children that is often portrayed unrealistically in the media as consequence-free. Physical risk taking can lead to injury, and injury is a leading cause of hospitalization and death during childhood.

Objective: To examine the effectiveness of a 4-week program for school-age children in reducing risk-taking behaviors and increasing safety behaviors.

Method: A 2-group, experimental, repeated-measures design was used to compare 122 White and Latino children randomly assigned to an intervention group or a wait-list group at baseline, and at 1, 3, and 6 months after intervention. Children received a behaviorally based intervention delivered in four 2-hour segments conducted over consecutive weeks. The thematic concept of each week (choices, media, personal risk taking, and peer group risk taking) moved from the general to the specific, focusing on knowledge and awareness, the acquisition of new skills and behaviors, and then the supportive practice and application of skills.

Results: Participants increased their safety behaviors ($p = .006$), but risk-taking behaviors remained unchanged. Families in the intervention group increased their consistent use of media rules ($p = .022$), but decreases in media alternatives suggest difficulty in taking up other habits/activities. Coping effectiveness was predictive of safety behaviors ($p = .005$) at 6 months and coping effectiveness plus television watching was predictive of risk taking ($p = .03$).

Conclusions: Findings from this study suggest that interventions that influence children's media experiences help prevent health-compromising behaviors and that strategies to aid parents in finding media alternatives are relevant to explore.

Key Words: children, risk taking, safety behaviors, television

Changes in Childhood Risk Taking and Safety Behavior After a Peer Group Media Intervention

Risk taking is a significant behavior that compromises health, and an expansive literature has emerged that describes the rapidly deteriorating and interrelated nature of health risk behaviors in American youth. Physical risk taking can lead to injury, and injury is a leading cause of hospitalization during childhood. Unintentional injury is the leading cause of death for children more than 1 year of age; more children die from injuries than from all diseases combined.

Injury is a phenomenon that is underrepresented in nursing research, which is surprising given the focus on health promotion in the field (Sommers, 2006). This lack of research on injury is especially critical given that rates for counseling about injury prevention remain low and have not changed in the past two decades in primary care except in two specific areas (poison control and bike helmet use). Yet research based on the national Injury Control and Risk Survey and earlier studies has shown that counseling by health care providers about injury prevention promotes safer behaviors (Chen, Kresnow, Simon, & Dellinger, 2007).

Health science researchers have established that children’s media consumption affects their health behaviors and is one of the factors that influence risk taking in children. Risk taking is portrayed in the media as consequence-free, and outcomes are rarely realistically depicted. Harmful outcomes are depicted in only 3% of prime-time television shows. If these shows were realistic, viewers would see 15 injuries per hour in adult shows, 24 injuries per hour during Saturday morning shows, and 46 injuries per hour in afternoon children’s shows. Potts, Doppler, and Hernandez (1994) experimentally manipulated children’s exposure to TV cartoons that depicted high- or low-risk behaviors and demonstrated that the children who saw the high-risk content reported a greater willingness to take risks. In 1998, Potts and Swisher demonstrated that

exposure to safety education videos decreased a child's willingness to take physical risks. Children are aware of their risk-taking behavior, and their intentions to take risk closely align with how they actually behave in risk situations (Morrongiello, 2004; Potts, Martinez, & Dedmon, 1995).

Kennedy (2000a) found that preschool-age children who often take physical risks watch more television and have parents with little media knowledge and few family media rules who provide little media monitoring. Gender, acculturation, and ethnicity influenced both the types of shows viewed and the amount of viewing time among White and Latino children and the rates of risk taking and injuries (Kennedy, 2000a, 2000b). Young school-age children report television as a "friend" and look upon it not only as entertainment but more importantly as a source of information, educating them on how to act in the world of grown-ups—a world that developmentally they are anxious to join and fit into (Kennedy, Strzempko, Danford, & Kools, 2002). Some work suggests that television viewing is chosen by children as a coping strategy, albeit a strategy that they view as not very effective (Chen & Kennedy, 2005). Children also report that at least 50% of their viewing time is by default, in that they watch television in order to spend time with their parents who are themselves watching television (Kennedy, 2000b; Kennedy et al., 2002). Despite parents' avowed beliefs that they regulate their child's exposure to negative media influences and encourage only positive shows, a serious gap exists between this belief and the actual viewing of television by children (Kennedy, 2000a).

Few studies have documented how other healthier choices can be developed in school-age children. In general, the body of research tends to focus on teenagers and the remediation of poor choices once such choices have been established. Recent work focused on identifying assets within the teen years suggests that identifying the antecedents to these positive behaviors would

be appropriate for health interventionists. Children’s health beliefs, perceptions, and practices such as risk-taking behaviors are relatively well defined and stable by 9 to 11 years of age; therefore, efforts to influence these behaviors should be made with younger school-age children. Most interventions to reduce television viewing are prescriptive, and even successful approaches to reducing daily television viewing time leave one to wonder whether the behavior can be maintained. It seems justifiable to enhance children’s understanding of the skewed media portrayal and to do so via a self-choice and self-care model.

Children’s risk taking is influenced by a variety of persons (child, parent, teachers), environmental factors (neighborhood, culture), and social factors (peers, media). Given the adverse health consequences of children’s media consumption and the developmental trajectory of negative health behaviors, the socialization of children's health behaviors remains surprisingly underexplored by nursing. One model that does include socialization of health behaviors is Cox's Interaction Model of Client Health Behavior (IMCHB). This conceptual model is grounded in a multidisciplinary perspective on the dynamic interplay between clients, the health professional's interaction with the child and family, and health outcomes (Figure 1) (Carter & Kulbok, 1995; Farrand & Cox, 1993). The model suggests that changes in children’s health behaviors by health care interventions occur via a change in the child’s cognitive appraisal (i.e., their health perception) and that intrinsic motivation and affective response (i.e., perceived self-competency) exert their influence on the child’s cognitive appraisal.

The primary aim of this prospective, randomized, 4-year longitudinal study was to test a peer group intervention aimed at decreasing physical risk-taking behaviors by influencing children’s media behaviors, understanding, and choices. Guided by the IMCHB model, factors that were examined include the child’s motivation, health perceptions, and self-competencies.

Children's coping strategies; parents' safety, media practices, and beliefs; and family functioning also were explored.

Methods

A two-group, experimental, longitudinal design was used to compare children who were randomly assigned to the intervention group (n = 57) or to a wait-list control group (n = 65) at four times: baseline (T1) and 1 month (T2), 3 months (T3) , and 6 months (T4) after the intervention.

Participants

Sixteen sites provided a total of 34 groups with an average of four children in a group. Of the 145 parents and children who were approached to participate, 11 declined because of time or activity conflicts and another 12 did not meet eligibility requirements. A total of 122 children (ages 8 and 9) and their mothers participated in the study (58 White and 64 Latino); the sample included 58 girls (47.5%) and 64 boys (52.5%). The groups were balanced in distribution by gender and ethnicity. No attrition or loss of participants was noted during the study. All children completed the baseline assessment and the three follow-up assessments.

Procedures

Human subject protection was approved by the University of California, San Francisco Committee on Human Research. Upon approval, subjects were solicited from community sources and after-school programs in Northern California. Eight-year-old children and their parents were eligible for enrollment if they met the following criteria: (1) the adult and child self-identified their ethnicity as either Latino or White; (2) the child was in good health, defined as free of an acute or life-threatening disease and able to attend to activities of daily living such as going to school; (3) parents, in addition to speaking either English, Spanish, or both, were able to

read in one of the two languages in order to fill out questionnaires written at a fourth- to sixth-grade level; and (4) parent and child participants resided in the same household.

After written consent was obtained from a parent, White and Latino families were randomly assigned to an intervention group or a control (wait list) group. Intervention groups received a 4-week program and completed measures at baseline (before the intervention) and 1, 3, and 6 months after the intervention. The wait-list control groups completed the same measures at the same time intervals. After 6-month data collection, the control group also received the intervention. All children's data were self-reported and obtained by using an interactive game on a laptop with software designed for the study (Kennedy, Charlesworth, & Chen, 2003). Parents used traditional pen and paper questionnaires in their preferred language and returned the completed forms by mail.

Verbal assent was obtained from all children, and confidentiality, group rules, and general guidelines were discussed with the children. Children received incentives (books and small surprises) each week of the program and a $20 gift certificate to a toy store upon completion of the program. Parents were given a gift certificate to a local food market.

Intervention

The intervention program was designed for small groups of four to six children, facilitated by a research team nurse or health counselor. The program comprised four content segments, conducted during consecutive weekly sessions. The thematic concept of each week moved from the general to the specific, focusing on knowledge and awareness, the acquisition of new skills and behaviors, and then the supportive practice and application of the skills. Essential to learning and internalizing the information presented, each week of the program allowed for repetition and practice within the group and at home. Although parents did not directly

participate in the program, they did receive weekly information packets containing media and health concepts similar to the content the children received that week. The concept of each program segment was reviewed further during the following week, in relation to the activities children had practiced at home, and as an introduction for the related successive concept. The behavioral basis of the program, process evaluation, and treatment fidelity are reported elsewhere (Kennedy & Floriani, 2008).

Measures

Five age-appropriate instruments designed for children and five instruments for parents that had literacy levels established at lower-grade-school readability were used (Table 1).

Affective. The Self-Perception Profile (SPP) is a 36-item questionnaire for assessing self-perceptions of competencies in children in third grade and older (Table 1).

Child's Health Behaviors. The reported overall health behaviors of the child were measured with a 36-item Likert scale called How Often Do You? (HODY). Stember, Swanson-Kaufman, Goodwin, Rogers & Mathews (1984) reported that "content and concurrent validity were sufficiently demonstrated" by this instrument (values not reported, Table 1).

Cognitive. The Child's Health Self-Concept Scale (CHSCS) measures children's cognitive appraisal (perception) of health (Hester, 1984). This 45-item scale takes approximately 15 minutes for the child to complete. Based on a diverse sample of 940 children, the authors originally created four subscales (Table 1), but because further analysis suggested that a single attribute is being measured, only a total score is reported.

Coping. The Schoolager's Coping Strategies Inventory (SCSI) is a 26-item self-report instrument that measures the type, frequency, and effectiveness of coping strategies used by

children (Ryan-Wenger, 1990). Each child identifies a stressor and then scores each coping strategy for frequency of use and for degree of helpfulness (effectiveness; Table 1).

Family Characteristics. Demographics were collected with a 31-item parent questionnaire for educational, financial, and social descriptive data. A 12-item Short Acculturation Scale (Marin, Saboget, Marin, Oter-Sabogal, & Perez-Stable, 1987) was used to measure the acculturation level of Latino families. The Acculturation Scale has demonstrated good psychometric properties in both its English and Spanish version (Table 1).

Family Functioning. The Family Assessment Device (FAD) has six specific subscales (Epstein, Baldwin, & Bishop, 1983) and a 12-item general functioning subscale that has been used as a global assessment of general health of the family (Table 1). Several studies have reported concurrent validity of the FAD as ranging from 0.48 to 0.53 and reliabilities from 0.69 to 0.86 (Kabakoff, Miller, Bishop, Epstein, & Keitner, 1990; Miller, Ryan, Keitner, Bishop, & Epstein, 2000).

Family Media. The Media Quotient was used to measure family media habits and beliefs about the effects of media (Gentile & Walsh, 2002). The reliability coefficients and test-retest correlations for the six indices of the Media Quotient are listed in Table 1. Gentile and Walsh report that the low reliability coefficient for the Media Knowledge index was expected because of the wide range of topics measured by this index (it was a heterogeneous index, whereas other indices were homogeneous). Across all items, the mean test-retest correlation is .75. The mean test-retest correlation for the six indices is .85. Validity was supported by the negative correlations between children's television viewing and each of the indices.

Motivation. The Health Self-Determinism Index–Children (HSDI–C) is composed of 32 forced-choice Likert format items divided over 4 subscales (Cox, 1985). Children were asked to

decide which kind of "kid" is most like themselves and then are asked whether this is "only sort of true" or "really true" for them (Table 1).

Risk Taking. The Injury Behavior Checklist (IBC) is a reporting measure for parents that contains 24 items describing various specific risk-taking behaviors and minor injurious mishaps for children up to age 9 (Table 1). The IBC score is predictive of subsequent injuries (Bass & Mehta, 1980; Bernardo, 1996; Kennedy & Rodriguez, 1999; Potts, Martinez, & Dedmon, 1995; Potts et al., 1997).

Safety Behaviors. The American Academy of Pediatrics Framingham Safety Survey (FSS) for 5 to 9 years is a 19-question parent report on home-based safety practices used to gather information so that caregivers in primary care clinical settings can provide counseling about injury prevention and safety behaviors (Table 1). The FSS is also referred to as The Injury Prevention Program Safety Survey. Five developmentally age-specific versions of the FSS are available in both English and Spanish. Psychometric properties (Table 1) reported for the younger FSS support acceptable internal and external reliability and validity for parent report (Mason, Christoffel, & Sinacore, 2007).

Data Analysis

Descriptive statistics were examined initially for demographic characteristics and all major study variables. The intervention and control groups were compared by using *t* tests to check for any major dissimilarity between the study groups at baseline. Partial correlation coefficients, with gender, weight status, ethnicity, and group membership (intervention vs control) controlled for, were computed to examine variables related to risk-taking and safety behaviors. Stepwise regressions were used to examine factors from the baseline data that contributed to children’s safety and risk-taking behaviors. We examined whether the rate of

change in the children in the intervention group was different than the rate among children in the control group by fitting linear mixed-effects models that include functions of time and group effects to the repeated child data. Analyses were performed with SPSS 15.0, and mixed modeling was performed by using SAS version 8.

Results

Approximately 86% of White and 22% of Latina mothers had completed a high school education. Four percent of White families and 38% of Latino families had annual incomes less than $20,000, whereas 82% of White families and 8% of Latino families had annual incomes greater than $40,000. Significantly more Latino mothers (77%) than White mothers (66%) were married ($\chi^2 = 13.05$, $p = .023$). Most of the Latino mothers (93%) were highly acculturated; 40% were US natives. The 60% who were born elsewhere had resided in the United States for more than 10 years.

Total scores on risk taking were significantly higher in boys (14.6) than in girls (11.0) ($t = 2.23$, $p < .02$) and in normal weight (15.0) than in overweight children (10.0) ($t = 2.59$, $p < .01$). The means for the major child model variables did not differ significantly in between the children in the two groups at baseline (Table 2).

Partial correlation coefficients were used to examine correlations between family variables and children’s behaviors, and regression models were computed to explore factors contributing to children’s risk-taking and safety behaviors at baseline. When we controlled for gender, ethnicity, weight, and group membership, we found that increased television viewing time was related to less use of safety behaviors ($r = -.34$, $p = .009$), and to less use of positive media ($r = -.32$, $p = .012$). Higher risk taking in children was significantly related to parents’

belief that media do not affect children (r = -.27, p = .036). Higher amounts of television watching also correlated with the child having a negative health self-concept (r = - .54, p < .001).

Stepwise regression models were computed to examine factors contributing to children's safety and risk-taking behaviors. The children's age and ethnicity were first, followed by seven subscales of the FAD (problem solving, communication, roles, affective involvement, affective responsiveness, behavior control, and general functioning), six indices from the Media Quotient (alternatives, consistency, effects, knowledge, monitoring, and media use), and total hours of television viewing. At baseline, five variables contributed to lower safety behaviors (adjusted R^2 = .37, F = 9.93, p < .0001): poorer problem solving in the family (sr^2 = .25); unhealthy (high) affective involvement in the family (sr^2 = .08); high use of alternative media in families (sr^2 = .08); high television viewing times among children (sr^2 = .06), and high use of positive media in the family (sr^2 = .07). Four variables were significant in predicting children's risk-taking behaviors (adjusted R^2 = .21, F = 6.70, p < .0001): being White (sr^2 = .16), being a boy (sr^2 = .03), poor affective responsiveness in the family (sr^2 = .10), and better media consistency (consistent use of media rules) in the family (sr^2 = .08) (Table 3).

We found no significant differences between groups in children's affect (SPP), cognition/health perceptions (CHSC), coping strategies, motivation (HSDI-C), or general health behaviors (HODY) during the 6-month period (Table 2). Children evidenced significant decreases in self-determined health judgment (HSDI-C subscale) over time (F = 3.09, p = .03), but no interaction was found between groups and time (F = 1.9, p = .13). Children, on average, watched 18 hours of television weekly. Television watching in the intervention group had decreased to 17 hours weekly by 6 months after the intervention, although this difference was not statistically significant (t = -1.90, p = .07). In the hierarchical mixed model, the intervention

1 group significantly increased their safety behaviors (F = 4.37, p = .006). No difference was
2 found in risk taking over time or between groups (F = .23, p = .87; Table 4). At the 6-month
3 follow-up, families in the intervention group reported two additional changes: an increase in the
4 consistent use of media rules (t = -.241, p = .022) but a decrease in use of alternative activities (t
5 = 2.21, p =.032). To explore these results further, we also ran regression analysis on children's
6 baseline variables as predictors of safety and risk-taking behaviors at 6 months after the
7 intervention. More effective coping by the child at baseline was predictive of higher use of safety
8 behaviors 6 months later (adjusted R^2 = .13, F = 8.69, p =.005). Higher television watching time
9 and less effective coping at baseline were predictive of higher risk taking behaviors at 6 months
10 after the intervention (adjusted R^2 = .21, F = 4.78, p = .034)

11 Discussion

12 *Theoretical Model*

13 These findings raise issues about the need for further refinement and testing of the
14 IMCHD model in pediatric nursing research. Carter and Kulbok (1995), in an evaluation of the
15 first 24 studies that used the model (with primarily adult subjects), suggested that more testing is
16 necessary, with possible modification because of several limitations in the studies published to
17 date. Farrand and Cox (1993), however, reported a fairly strong confirmation of the proposed
18 linkages in the only pediatric study that used the model, in which they identified gender-specific
19 determinants of children's health behaviors. They reported that the central role of cognitive
20 appraisal/health perception (as measured with the CHSCS) is to mediate the effects of affective
21 responses (perceived competency) and motivation on the outcome of health behaviors.

22 In our study on risk taking and health behaviors, the role reported by Farrand and Cox
23 was not supported. We used the same measurement tools as were used in the Farrand and Cox

study for the four variables (HSDI-C, CHSCS, SPP, HODY), so we do not think that our results are due to inconsistency in operationalization of measurement. Instead, as suggested by Carter and Kulbok, it is possible that cognitive appraisal as measured by the CHSCS: (1) should not be captured only as "perceived health status," (2) needs further development as a construct, and (3) may not be sensitive to developmental change over time. Relevant to the first point, Morrongiello and Mark (2008) reported that by targeting specific risk-taking cognitions, in contrast to general perceived health cognitions, they could reduce children's risk-taking intentions by using an induced-hypocrisy intervention. Regarding the second point, in construct validity testing, the CHSCS did not discriminate into its original 5 subscales, suggesting little support for the construct validity of the subscales and leaving unknown the construct validity of the CHSCS as a measure of a single attribute. Our study is the first to use a longitudinal design and repeated measures in children, thus from a developmental perspective, we believe that the third point also has merit.

In both groups, self- determined health judgment decreased significantly in the 6 months after the intervention ($F = 3.09$, $p = .03$), reflecting movement from an intrinsic to extrinsic orientation. This result is in contrast to the results originally reported by Cox, Cowell, Marion, and Miller (1990), who found a linear trend from extrinsic to intrinsic motivation with increasing age. Those values, however, were based on cohort studies and not on longitudinal changes with the same study population, and they reflect a much wider age range (third-seventh grade). Cox et al. (1990) reported excellent consistency for the HSDI-C with 2-week test-retest reliability, but they noted that the 1 year test-retest alpha values decreased and suggested that the measure might be capturing state versus trait behavior. Further psychometric property testing should address

1 whether the HDSI-C is stable for midrange periods such as 6 months if it is to be used fruitfully
2 in future short-term longitudinal studies.

3 The published model does not address coping specifically. Our earlier work supported
4 investigating coping because children reported television watching as one of their most frequent,
5 but ineffective coping strategies (Chen & Kennedy, 2005). A child's coping effectiveness was
6 predictive of both safety and risk-taking behaviors 6 months later. This finding suggests that
7 coping strategies should continue to be investigated as a relevant facet of children's health
8 intervention work, especially given reports that training in coping skills enhances behavioral
9 interventions in diverse areas such as pediatric diabetes (Grey, Boland, Davidon, Li, &
10 Tamborlane, 2000) and weight reduction (Berry, Savoye, Melkus, & Grey, 2007).

11 *Media*

12 Awareness of the influence of media on children's health behaviors is increasing in the
13 health science literature and among clinicians. The results of this study support the continuing
14 need to address this factor in health care. Unlike in other studies, we did not try to make a rule to
15 decrease total television viewing time but rather tried to influence the children's own choice of
16 activities and to bring to their attention the unrealistic portrayal of risk-taking behavior in the
17 media, as it might affect both themselves and others. At 18 hours a week, the total television
18 watching time of the children in this sample is less than the national average of 21 hours a week
19 but is still not at the American Academy of Pediatrics' recommendation of 2 hours or less a day
20 (14 hours weekly). Higher risk taking in children was significantly related to parents' belief that
21 media do not affect children, and yet large amounts of television watching did correlate
22 significantly with children reporting a more negative perception self-concept of their own health.
23 Greater television viewing time was also related to less use of safety behaviors in households.

At the 6-month follow-up, families in the intervention group reported a significant increase in the consistent use of media rules but a decrease in use of alternative activities. These findings suggest that families still need help in creating and maintaining lifestyles that enhance activity choices other than watching television. Future studies attempting to address media use in the parent-child dyad or (even more challenging) the family as a whole will be critical. Equally compelling is the idea that a "booster" session might be necessary to continue to support changes, as has been suggested in publications about changing behaviors such as smoking, diet, and exercise in adults. The literature is virtually silent on this issue for children, and thus research on what sustains health behavior habits is critical for the future.

Risk Taking and Safety

As expected, boys scored higher than girls scored on risk taking. This finding is in concert with the robust gender differences reported in the injury literature. As in most other studies, we have operationalized risk taking as a physical activity, which might also account for the significantly lower rates of risk taking in overweight children compared with children of normal weight in the study. Green (1997) found that physical risk taking is an important factor in the creation of boys' social identity. Results of a recent ethnographic study suggest that girls are risk takers when social domains are included (Christensen & Mikkelsen, 2008). Christensen and Mikkelsen suggested that children's risk engagement and risk taking are a balancing act between risk willingness and self-care within the context of social relationships, emotional excitement, and connections and activities with other children. No difference was found in risk taking over time or between the intervention and control groups; possibly the intervention was not motivating enough to lower risk-taking behavior because it did not attend to the social identity and perceptions of other peers in the group.

A second potential explanation is that risk taking was already low at baseline in the two groups, with a mean score of 13 on the IBC. The four previous studies that used thee IBC reported mean scores from 18 to 33. For example, Speltz, Gonzales, Sulzbacher, and Quan (1990) found that children with two injuries or more scored significantly higher on the IBC (mean, 33.7) than did children with no injuries (mean, 22) and 1 injury (mean, 24). Kennedy replicated those results finding that the IBC was predictive of the injury outcome in both White (Kennedy & Lipsitt, 1998) and Latino children (Kennedy & Rodriguez, 1999) Bernardo (1996) reported a mean IBC score of 22 in a sample of White non-Hispanic and African American children; and Potts et al. (1995) reported a mean score of 19 in a Midwestern White sample. Thus the lack of change might reflect a "floor effect," where reduction of risk taking is less likely in a group that is already low in risk taking.

A third explanation arises from a recent report by Morrongiello and Matheis (2007), who used IBC scores reported by the child rather than the parent (all other studies had used scores reported by the parent). They found that school-age children routinely engage in greater risk taking than their parents would have them do and that parents often were not told about minor injuries or risk-taking behaviors. This result suggests that potential underreporting of risk taking by parents of school-age children, in contrast to reports from younger children.

Families whose child received the intervention showed a significant increase in safety behaviors, and this effect was sustained for the 6 months. The intervention activities of the children that were practiced at home and possibly the parental materials that were sent home influenced modifications in the home environment, as measured by the safety behaviors. Given the baseline predictors of safety behaviors, we suggest that the intervention engaged mothers' affective-based perspectives and enhanced maternal problem solving. Decisions by mothers to

1 engage in safety practices are driven by affect rather than knowledge, that is, by changes in
2 perception of their specific child's characteristics that they believe make their child vulnerable
3 (Morrongiello & Kiriakou, 2004). Our finding that poor affective involvement is related to low
4 safety behaviors among mothers supports this interpretation.

5 A consistent theme in the study intervention was that the media promote risk taking.
6 Families in the intervention group increased their use of rules related to media use, but they also
7 reported less skill at coming up with alternative activities to replace watching television. Perhaps
8 the safety behaviors measured in the FSS tap those behaviors that the mothers could effectively
9 change. Kronenfeld, Reiser, Glik, Alatorre, and Jackson (1997), who also used the FSS, reported
10 greater use of safety behaviors in families with mothers who had high stress levels and high
11 levels of coping skills. In their structural equation model, stress and coping (affect variables)
12 were the only variables to have a direct effect on safety behaviors. Perceptions (cognitive
13 variables) did not influence behavior directly, but operated only indirectly to increase use of
14 safety behaviors. In our sample, however, maternal stress levels were similar and unchanged in
15 the control group and the intervention group (Author, 2008). We did not measure maternal
16 coping and thus cannot illuminate its potential contribution.

17 This study had several limitations. Most children in the sample had low levels of risk-
18 taking behaviors. Although no published studies have suggested what a risk-free profile might
19 consist of, our earlier studies suggest that IBC scores of 24 and higher are predictive of injury**.**
20 The intervention might have been more effective if it had been tested only on children with high
21 risk-taking profiles and a history of previous injuries. Given the variability of the intervention
22 effects, the strength of the intervention might not have been adequate to achieve the desired
23 treatment effects. Results might be improved by increasing the number of sessions and including

a booster session. Health care intervention research has typically attempted to deliver standard "packages" to test the effectiveness on an outcome. Such an approach is constricting, particularly with the advent of clinical practice models that are relationship- and client-centered and the heightened awareness of individual differences stemming from developmental psychology. Future studies with children could benefit from design approaches similar to those used in the adult stages-of-change model and use of person-centered cluster analysis instead of traditional variable-centered methods.

Despite these limitations, the intervention increased use of safety behaviors and thus affected one part of the injury equation. Future research with high risk-taking populations and the design of approaches that enhance the social/emotional milieu are necessary for further refinement of interventions. Social risk taking should be addressed, in addition to physical activities, to reduce the continuing gender gap in these studies. If some physical risk taking is a necessary social developmental experience in the context of peer play and risk engagement, as suggested by Christensen and Mikkelsen (2008), then the very low rates of physical risk taking among overweight children suggest additional psychological issues that intervention programs to reduce sedentary activity and increase physical activity will have to address for health promotion.

In conclusion, Sommers (2006) suggests that four strategies are needed for nurses to build injury science: identification of individuals at risk, development of models to explain the association between risk taking and injury, development and testing of interventions to prevent and control injury, and refinement of interventions that are culturally relevant. The results of this study contribute to these goals to foster a child and family approach for nurses practicing in primary care and community settings.

References

Author. (2008). Maternal health and family media use. Manuscript submitted for publication.

Bass, J. L., & Mehta, K. A. (1980). Developmentally-oriented safety surveys: Reported parental and adolescent practices. *Clinical Pediatrics, 19*, 350-356.

Bernardo, L. M. (1996). Parent-reported injury-associated behaviors and life events among injured, ill, and well preschool children. *Journal of Pediatric Nursing, 11*(2), 100-110.

Berry, D., Savoye, M., Melkus G., & Grey, M. (2007) An intervention for multiethnic obese parents and overweight children. *Applied Nursing Research, 20 (2),* 63-71.

Carter, K. F., & Kulbok, P. A. (1995). Evaluation of the interaction model of client health behavior through the first decade of research. *Advances in Nursing Science, 18*(1), 62-73.

Chen, J. L., & Kennedy, C. (2005). Cultural variations in children's coping behavior, TV viewing time, and family functioning. *International Nursing Review, 52*(3), 186-195.

Chen, J., Kresnow, M. J., Simon, T. R., & Dellinger, A. (2007). Injury prevention counseling and behavior among US children: Results from the second injury control and risk survey. *Pediatrics, 119*(4), e958-e965.

Christensen, P., & Mikkelsen, M. R. (2008). Jumping off and being careful: Children's strategies of risk management in everyday life. *Sociology of Health & Illness, 30*(1), 112-130.

Cox, C. (1985). The health self-determinism index. *Nursing Research, 34*(3), 177-182.

Cox, C. L., Cowell, J. M., Marion, L. N., & Miller, E. H. (1990). The health self-determinism index for children. *Research in Nursing and Health, 13*, 237-246.

Epstein, N., Baldwin , L., & Bishop, S. (1983). The McMaster Family Assessment Device. *Journal of Martial and Family Therapy, 9*, 171-180.

Farrand, L., & Cox, C. (1993). Determinants of positive health behaviors in middle childhood. *Nursing Research, 42*(4), 208-213.

Gentile, D. A., & Walsh, D. A. (2002). A normative study of family media habits. *Applied Developmental Psychology, 23*, 157-178.

Green, J. (1997) Risks and the construction of social identity: Children's talk about accidents**.** *Sociology of Health & Illness, 19*(4), 457-479.

Grey, M., Boland, E., Davidon M, Li, J. & Tamborlane, W.V. (2000). Coping skills training for youth with diabetes mellitus has long-lasting effects on metabolic control and quality of life. *J Pediatrics, 137,* 107-113.

Hester, N. O. (1984). The child's health self-concept scale: Its development and psychometric properties. *Advances in Nursing Science, 7*, 45-55.

Kabakoff, R., Miller, I., Bishop, D., Epstein, N., & Keitner, G. (1990) A psychometric study of the McMaster Family Assessment Device in psychiatric, medical and nonclinical samples. *Journal of Family Psychology, 3*, 431-439.

Kennedy, C. (2000a). Television and young Hispanic children's health behaviors. *Pediatric Nursing, 26*(3), 283-294.

Kennedy, C. (2000b). Examining television as an influence on children's health behavior. *Journal of Pediatric Nursing: Nursing Care of Children and Families, 15*(5), 272-281.

Kennedy, C., Charlesworth, A., & Chen, J. L. (2003). Interactive data collection: Benefits of integrating new media into pediatric research. *Computers in Nursing, 21*(3), 120-127.

Kennedy, C., & Floriani, V. (2008). Translating research on healthy lifestyles for children: Meeting the needs of diverse populations. *Nursing Clinics of North America, 43*(3), 397-417.

Kennedy, C., & Lipsitt, L. (1998). Risktaking behavior in preschool children. *Journal of Pediatric Nursing: Nursing Care of Children & Families, 13*(2), 1-7.

Kennedy, C. M., & Rodriguez, D. A. (1999). Risktaking in young Hispanic children. *Journal of Pediatric Health Care, 13*(3, Part 1), 126-135.

Kennedy, C., Strzempko, F., Danford, C., & Kools, S. (2002). Children's perceptions of TV and health behavior. *Journal Nursing Scholarship, 34*(3), 297-302.

Kronenfeld, J. J., Reiser, M., Glik, D. C., Alatorre, C., & Jackson, K. (1997). Safety behaviors of mothers of young children: Impact of cognitive, stress and background factors. *Health, 1*(2), 205-225.

Marin, G., Saboget, F., Marin, B. V., Oter-Sabogal, R., & Perez-Stable, E. J. (1987). Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences, 9*, 183-205.

Mason, M., Christoffel, K. K., & Sinacore, J. (2007). Reliability and validity of The Injury Prevention Project Home Safety Survey. *Archives of Pediatric & Adolescent Medicine, 161*(8), 759-765.

Miller, I. W, Ryan, C. E., Keitner, G. I., Bishop, D. S., & Epstein, N. B. (2000). The McMaster Approach to Families: Theory, assessment, treatment and research. *Journal of Family Therapy, 22*, 168-189.

Morrongiello, B. A. (2004). Do children's intentions to risk take relate to actual risk taking? *Injury Prevention, 10*, 62-64.

Morrongiello, B. A., & Kiriakou, S. (2004). Mothers' home-safety practices for preventing six types of childhood injuries: What do they do, and why? *Journal of Pediatric Psychology, 29*(4), 285-297.

Morrongiello, B. A., & Mark, L. (2008, February 21). "Practice what you preach": Induced hypocrisy as an intervention strategy to reduce children's intentions to risk take on playgrounds. *Journal of Pediatric Psychology Advance Access*. doi:10.1093/jpepsy/jsn011

Morrongiello, B. A., & Matheis, S. (2007). Understanding children's injury-risk behaviors: The independent contributions of cognitions and emotions. *Journal of Pediatric Psychology, 32*(8), 926-937.

Potts, R., Doppler, M., & Hernandez, M. (1994). Effects of television content on physical risk-taking in children. *Journal of Experimental Child Psychology, 58*, 321-331.

Potts, R., Martinez, G. M., & Dedmon, A. (1995). Childhood risk taking and injury: Self-report and informant measures. *Journal of Pediatric Psychology, 20*(1), 5-12.

Potts, R., Martinez, I. G., Dedmon, A., Schwarz, L., DiLillo, D., & Swisher, L. (1997). Brief report: Cross-validation of the injury behavior checklist in a school-age sample. *Journal of Pediatric Psychology, 22*(4), 533-540.

Potts, R., & Swisher, L. (1998). Effects of televised safety models on children's risk taking and hazard identification. *Journal of Pediatric Psychology, 23*(3), 157-163.

Ryan-Wenger, N. M. (1990) Development and psychometric properties of the schoolagers' coping strategies inventory. *Nursing Research, 39*(6), 344-349.

Sommers, M. S. (2006). Injury as a global phenomena of concern in nursing science. *Journal of Nursing Scholarship 38*(4), 314-320.

Speltz, M. L., Gonzales, N., Sulzbacher, S., & Quan, L. (1990). Assessment of injury risk in young children: A preliminary study of the injury behavior checklist. *Journal of Pediatric Psychology, 15*(3), 373-383.

Stember, M., Swanson-Kaufman, K., Goodwin, L., Rogers, S., & Mathews, S. (1984) How often do you? Denver: University of Colorado Health Services Center

Table

Table 1 Instruments Used to Assess Children and Their Families

Instrument	Assessment	Subscales	Score range	Psychometric properties
Self-Perception Profile	Affect in children 8 to 12 years old	Scholastic competence Athletic competence Social acceptance Physical appearance Behavioral conduct Global self-worth	Likert scale, 1 (low) to 4 (high)	Internal consistency reliability α, .80 to .85 for scholastic competence, .80 to .86 for athletic competence, .75 to .80 for social acceptance, .76 to .82 for physical appearance, .71 to .77 for behavioral conduct, and .78 to .84 for

				global self-worth
How Often Do You?	Child’s health behaviors	Safety “Junk" food Activity Nutrition Hygiene Assertiveness	1 (low frequency) to 4 (high frequency)	Cronbach α, .86-.91
Child's Health Self-Concept Scale	Children’s perception of their health	Psychosocial issues Physical health Values Energy and healthiness	Summative rating scale from 1 (negative health self-concept) to 4 (positive health self-concept)	Moderate stability High internal consistency reliability (.82) Evidence of content validity
Schoolager's Coping Strategies Inventory	Coping in children ages 8 to 12 years	Frequency of use of coping strategy Effectiveness of coping strategy	0 (low) to 3 (high)	Construct validity Internal consistency (r = .79) Test-retest

				reliability (r = .73-.82) Cronbach α reliability coefficients: .84 for frequency subscale, .85 for effectiveness subscale
Short Acculturation Scale	Acculturation of Latino families	Validity criteria: Respondents' generation Length of residence in the United States Age on arrival in the United States	Average of scores on Likert scale from 1 to 5; scores ≤2.99 low, scores >2.99 high	Correlated with respondents' generation (r = .69), length of residence in the United States (r = .76), and age on arrival in the United States (r = .72)
Family Assessment Device	Family functioning	Problem solving Communication	Likert scale, 1 (strongly agree) – 4	Cronbach α: .73 for problem solving, .72 for

		Roles Affective responsiveness Affective involvement Behavior control General functioning	(strongly disagree) Higher scores indicate poorer function	communication, .70 for roles, .69 for affective responsiveness, .64 for affective involvement, .52 for behavior control, and .82 for general functioning.
Media Quotient	Family media habits and beliefs	Media use Monitoring Consistency Media effects Media knowledge Alternative activities	Likert scale always(1)- never (5)	Reliability coefficients: Media use, α = .75; Monitoring, α = .89; Consistency, α = .73; Media effects, α =.63; Media knowledge, α = .25; and Alternative

				activities, α = .66 Test-retest correlations: Media use, *r* = .96 Monitoring, *r* = .82 Consistency, *r* = .89 Media effects, *r* = .84 Media knowledge, *r* = .81 Alternative activities, *r* = .82
Health Self-Determinism Index–Children	Motivation of children	Self-determinism in health behavior/goals Competency in	1 (maximum extrinsic orientation) to 4 (maximum intrinsic	Internal consistency (Cronbach α), .78 2-week test-

		health matters Internal-external cue responsiveness Self-determinism in health judgment	orientation)	retest correlation for total tool, .83.
Injury Behavior Checklist	Parents report on frequency of children's risk-taking behaviors in past 6 months	24 items describing risk-taking behaviors	0 (not at all) 1 (very seldom, has happened once to twice) 2 (sometimes, about once a month) 3 (pretty often, about once a week) 4 (very often, more than once a week) Total sum for all 24 items, 0	Internal consistency, .84-.92 1-month test-retest correlation, .81 Specificity adequate

			to 96	
Framingham Safety Survey	Parents describe home-based safety practices	19 questions on injury prevention and safety behaviors	1 (low) to 3 (high) safety for each response, with a total score from 19 to 57 Higher scores reflect greater safety behaviors	Internal reliability (Cronbach α), .86 External reliability, p = .40 Validity, r = .69 in English, 1.0 in Spanish

Table

Table 2

Child Variables (Means and Standard Deviation)

Variable	Intervention				Control			
	T1	T2	T3	T4	T1	T2	T3	T4
Framingham Safety Survey	41.41 (0.68)	43.95 (0.74)	44.70 (0.70)	45.09 (0.66)	43.48 (0.68)	44.19 (0.89)	43.87 (0.76)	44.09 (0.79)
Injury Behavior Checklist	13.62 (1.10)	14.20 (1.29)	11.91 (1.19)	11.31 (1.14)	12.50 (1.11)	12.13 (1.51)	12.93 (1.30)	11.58 (1.35)
Health Self-Determinism Index–Children (HSDI-C) Behavior	35.94 (6.31)	37.33 (7.10)	37.27 (6.16)	37.09 (6.87)	36.51 (6.05)	37.12 (6.68)	36.85 (5.63)	36.16 (8.96)
HSDI-C Internal: External Cue Response	14.15 (4.27)	14.06 (4.20)	13.27 (3.75)	13.54 (6.87)	13.37 (3.97)	14.38 (4.00)	14.33 (4.28)	14.00 (4.27)
HSDI-C Competence	15.70 (4.07)	14.90 (5.01)	14.75 (4.04)	13.92 (4.20)	15.37 (3.97)	14.20 (3.90)	14.21 (4.06)	14.91 (4.41)
HSDI-C Judgment	7.31 (2.43)	7.21 (2.84)	6.72 (2.66)	6.06 (2.37)	6.92 (2.67)	6.65 (2.80)	6.47 (2.76)	7.03 (2.9)
Self-Perception Profile (SPP) Scholastic Competence	17.75 (4.22)	18.63 (3.59)	18.61 (4.09)	18.45 (4.08)	17.61 (3.64)	18.12 (3.64)	18.31 (3.42)	17.46 (4.48)
SPP	16.48	16.61	17.43	16.90	16.50	16.79	16.97	17.16

Social Acceptance	(4.03)	(4.57)	(4.63)	(4.89)	(3.10)	(3.59)	(3.53)	(3.97)
SPP Athletic Competence	17.06 (3.81)	16.73 (4.16)	17.31 (3.71)	17.43 (4.28)	16.71 (3.51)	16.38 (3.97)	16.21 (4.33)	16.27 (4.00)
SPP Physical Appearance	18.91 (3.87)	19.12 (4.24)	19.00 (3.85)	19.19 (4.27)	17.98 (4.33)	18.23 (3.89)	18.41 (3.77)	18.03 (4.4)
SPP Behavioral Conduct	18.25 (2.95)	19.47 (3.26)	19.27 (3.28)	18.34 (3.92)	18.25 (3.46)	18.84 (3.16)	19.04 (3.18)	18.84 (3.88)
SPP Global Self-Worth	19.52 (4.11)	19.08 (3.73)	19.29 (3.60)	19.55 (3.85)	18.99 (3.00)	19.32 (3.77)	19.75 (3.71)	18.97 (3.75)
Child's Health Self-Concept Scale, Total	133.12 (15.02)	134.34 (17.48)	136.67 (17.55)	136.21 (17.15)	133.45 (14.86)	136.52 (14.44)	135.45 (15.28)	133.68 (14.66)
How Often Do You? Total	114.81 (10.04)	113.35 (11.94)	115.92 (10.72)	116.10 (10.29)	111.87 (11.43)	114.00 (11.29)	113.19 (10.86)	114.94 (11.58)
Schoolager's Coping Strategies Inventory (SCSI), Frequency	38.30 (10.39)	37.84 (10.59)	38.81 (8.30)	37.45 (10.30)	37.21 (10.74)	36.91 (8.61)	35.68 (8.80)	38.31 (9.41)
SCSI, Effectiveness	44.68 (10.46)	42.97 (10.06)	45.46 (9.24)	42.10 (9.90)	45.42 (11.71)	42.64 (8.53)	42.99 (8.75)	44.39 (9.52)

Note. T1 is baseline, T2 is 1 month after baseline, T3 is 3 months after baseline, and T4 is 6 months after baseline.

Table

Table 3

Stepwise Multiple Regression Summary Table

Source	Adjusted R^2	beta	sr^2	*df*	*F*	*p*
Low Safety Behaviors						
Overall	.37			5, 70	9.93	.0001
Poorer problem solving		-.457	.25	5, 70	23.37	.0001
High affective involvement		.230	.08	5, 70	5.90	.018
Better media use		-.250	.07	5, 70	4.96	.029
High use of alternative media		-.283	.08	5, 70	6.22	.015
High television viewing time		-.199	.06	5,70	4.31	.041
High Risk taking						
Overall	.21			4, 83	6.70	.0001
White		-.470	.16	4, 83	15.24	.0001
Boy		-.170	.03	4, 83	2.97	.05
Poorer affective response		.378	.10	4, 83	9.70	.003
Better media consistency		.265	.08	4, 83	7.21	.009

Table 4

General Mixed Model Summary Table

Variables	-2 log likelihood	Group F (p)	Time F (p)	Group x time F (p)
Framingham Safety Survey	1327.3	.01 (.908)	9.17 (.001)	4.37 (.0062)
Injury Behavior Checklist	1948.6	.017 (.6827)	.50 (.6684)	.23 (.8742)
Health Self-Determinism Index–Children (HSDI-C) Behavior/Goal	516.6	.11 (.7421)	.38 (.7697)	.23 (.8744)
HSDI-C Competence	596.6	.000 (.9884)	1.22 (.3078)	.70 (.5532)
HSDI-C Internal/external cue	658.7	.33 (.5644)	1.50 (.2201)	1.60 (.1926)
HSDI-C Judgment	661.2	.08 (.7839)	3.09 (.0314)	1.90 (.1340)
Self-Perception Profile (SPP) Athletic competence	576.1	.96 (.3304)	1.03 (.3836)	.66 (.5783)
SPP Behavioral conduct	553.3	.09 (.7664)	1.40 (.2442)	.72 (.5414)
SPP Physical appearance	590.9	1.93 (.1673)	.39 (.7625)	.47 (.7071)
SPP Scholastic competence	581.4	.77 (.3812)	.96 (.4162)	.66 (.5809)
SPP Social acceptance	568.9	.01 (.9258)	.25 (.8617)	.16 (.9219)
SPP Global self-worth	563.3	.34 (.5588)	.57 (.6340)	.56 (.6441)
Child's Health Self-Concept Scale	90.3	.03 (.8533)	.64 (.5936)	.66 (.5776)
How Often Do You?	2527.9	.33 (.5671)	1.53 (.2108)	1.37 (.2537)

Figure

Figure 1. Child health behaviors and intervention model.