ORIGINAL ARTICLE

Childhood injury prevention practices by parents in Mexico

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Objective: Scientifically based injury prevention efforts have not been widely implemented in Latin America. This study was undertaken to evaluate the baseline knowledge and practices of childhood safety on the part of parents in Monterrey, Mexico and in so doing provide information on which to base subsequent injury prevention efforts.

Methods: Interviews were carried out with parents from three socioeconomic strata (upper, middle, lower). Questionnaires were based on Spanish language materials developed by The Injury Prevention Program (TIPP) of the American Academy of Pediatrics.

Results: Data were obtained from parents of 1123 children. Overall safety scores (percent safe responses) increased with increasing socioeconomic status. The differences among the socioeconomic groups were most pronounced for transportation and less pronounced for household and recreational safety. The differences were most notable for activities that required a safety related device such as a car seat, seat belt, helmet, or smoke detector. Appropriate use of such devices declined from 47% (upper socioeconomic group) to 25% (middle) to 15% (lower).

Conclusions: Considerable differences in the knowledge and especially the practice of childhood safety exist among parents in different socioeconomic levels in Mexico. Future injury prevention efforts need to address these and especially the availability, cost, and utilization of specific highly effective safety devices.

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The current study was undertaken to provide baseline information on the knowledge and practices of childhood safety on the part of parents in several different socioeconomic levels in a Mexican city. It is hoped that this information will allow subsequent safety related social marketing strategies to be carried out more effectively.

METHODS

The study setting was Monterrey. Parents were selected to be interviewed from each of three socioeconomic strata. In the upper and middle socioeconomic groups this consisted of parents accompanying children during clinic visits. Separate clinics, primarily catering to each socioeconomic group, were utilized. For the lower socioeconomic group, household interviews were conducted in two separate neighborhoods. In all cases, convenience sampling was utilized.¹ In the upper and middle socioeconomic groups, all consecutive parents who presented to the clinic during the shift of the researchers were approached. In the lower socioeconomic areas, sampling involved approaching households in several sites in each neighborhood. These sites included zones both near and remote to the neighborhood health centers, which served as the bases of operation for the project.

For each of the three socioeconomic levels, the project is ultimately carrying out social marketing campaigns to improve parental safety knowledge. This is being carried out in one of the settings (clinic or neighborhood) in each socioeconomic strata, with the other setting serving as a control. We report here the information combined for both settings (intervention and control) in each strata before any intervention had been carried out.

For the interviews, the study utilized pre-existing Spanish language questionnaires from The Injury Prevention Program (TIPP) of the American Academy of Pediatrics (www.aap.org and www.aap.org/family/tippmain.htm).² Separate questionnaires exist for each of the following age groups: under 1, 1–4,

5–9, and 10–12 years. Some parents would have filled out several questionnaires, depending on the ages of their children. Each questionnaire was one page and consisted of 9–23 multiple choice questions.

The TIPP questionnaires provide two to four choices for each question. The choices reflect varying degrees of safety. However, only one is considered the correct (for example, safest) response. For purposes of the analysis, each answer was coded as to whether it was correct (for example, the one safest response) or incorrect (for example, all other answers). If a question was left blank, it was not scored.

For each individual questionnaire a score of percent correct was generated. Subscores were then generated for two separate domains of questions: (1) type of safety behavior utilized (caution v device) and (2) location of the activity (household, recreation, and transportation). As regards the first domain, caution implied those activities for which improved safety involved a safe action or absence of an unsafe action. Device implied those activities for which a specific safety related device would be required to be purchased or utilized. This involved such items as car seats, seat belts, smoke detectors, and helmets.

Comparisons were made for the mean percent correct responses, upper v middle v lower socioeconomic level. These comparisons were made for overall score and for the score for each domain category (type of safety behavior and location of activity). Finally, comparisons among the different socioeconomic levels were made for several specific highly important individual questions, such as seat belt use, helmet use, and smoke detectors.

Statistical comparisons were performed utilizing analysis of variance and χ^2 .³ The study was approved by the Health Department of Monterrey.

RESULTS

A total of 1123 questionnaires were filled out. This represented responses involving at least 1123 children. In some cases parents may have had more than one child in the respective age

Table 1 Percent safe response scores by type of activity (caution v use of device) for all children and by age group. Data presented as mean (SD)

Age	Socioeconomic level			p Value
	Upper	Middle	Lower	
Caution				
0–1	79.3 (10.5)	78.3 (10.9)	79.6 (11.1)	0.85
1–4	69.9 (14.2)	71.2 (16.1)	71.9 (17.8)	0.43
5–9	75.0 (15.8)	63.7 (16.8)	59.9 (16.7)	<0.001
10–12	84.0 (14.0)	80.8 (15.0)	83.4 (15.6)	0.37
Total	74.1 (14.8)	71.8 (16.8)	71.5 (18.8)	0.04
Device				
0–1	56.0 (19.4)	32.9 (24.2)	20.9 (22.7)	<0.001
1–4	46.7 (24.9)	26.8 (23.4)	25.2 (26.3)	<0.001
5–9	46.2 (19.6)	24.7 (23.8)	9.5 (13.0)	<0.001
10–12	35.9 (21.1)	16.0 (21.3)	3.4 (13.3)	<0.001
Total	47.0 (22.9)	24.6 (23.6)	15.4 (22.3)	<0.001

Table 2 Percent safe response scores by location of activity (household v recreation v transportation). Data presented as mean (SD)

	Socioeconomic level			p Value
	Upper	Middle	Lower	
Household	59.7 (15.3)	57.6 (14.5)	58.7 (15.1)	0.10
Recreation	70.5 (36.4)	62.7 (37.0)	62.1 (37.1)	<0.001
Transportation	71.5 (27.7)	41.9 (32.7)	35.7 (31.9)	<0.001

group (for example, 1–4, 5–9, or 10–12), but would have only filled out one questionnaire. In some cases the different questionnaires represented children in the same family. Specific information on the number of children represented by each questionnaire or on which questionnaires represented children in different age groups in the same family were not collected. The following numbers of questionnaires were obtained for each age group: 151 (<1), 349 (1–4), 379 (5–9), and 244 (10–12). Questionnaires were equally divided among the three socioeconomic groups.

The overall mean percent safe response scores increased with increasing socioeconomic level: 65% for the upper, 57% for the middle, and 55% for the lower level ($p < 0.001$). Similar differences pertained to most age groups. The differences between the middle and lower levels were fairly small in comparison to the differences between these levels and the upper level.

There were minor and inconsistent differences between the socioeconomic levels as regards actions for which only caution was involved (table 1). However, there were dramatic

differences between the levels as regards use of safety related devices. Almost all of the differences between the overall safety scores for the different social strata were accounted for by the differences in use of safety related devices.

There were minor and inconsistent differences among the socioeconomic levels as regards household safety (table 2). There were moderate level differences as regards recreation safety, but notable differences as regards transport safety. Most of the difference between the levels was due to differences in transport safety.

Table 3 provides details of several highly important individual questions. Percent safe responses tended to rise with increasing socioeconomic level for most, but not all, questions. The most dramatic differences among the groups were for use of car seats for 0–4 year olds. Smaller, but significant, differences pertained to use of seat belts for older children. There were also notable differences among the socioeconomic levels for use of bicycle helmets and smoke detectors, although utilization of these was low in all groups.

Table 3 Percent safe responses for individual questions

Question (with pertinent age groups)	Socioeconomic level			p Value
	Upper	Middle	Lower	
Does your child wear a helmet every time he or she rides a bike? (5–9 and 10–12 years)	28 (42/149)	16 (33/201)	8 (14/187)	<0.001
Has your child learned to cross the street safely? (5–9 years)	74 (75/102)	70 (82/117)	69 (79/115)	0.73
Have you checked the hot water temperature where you live? (1–4 years)	2 (2/109)	0 (0/54)	6 (3/50)	0.11
Do you have a working smoke or fire detector in your home? (all ages)	8 (30/357)	2 (8/346)	1 (4/307)	<0.001
Where do you place your child or your child's car seat in the car? Safe response is back seat (0–1 and 1–4 years)	88 (155/176)	71 (53/75)	44 (19/43)	<0.001
Does your child use a car seat? (0–1 and 1–4 years)	82 (154/188)	32 (44/139)	7 (7/100)	<0.001
Does your child use a seat belt? (5–9 and 10–12 years)	37 (61/167)	29 (62/212)	24 (43/181)	0.03

DISCUSSION

Before drawing conclusions from the data, the limitations of the study methodology must be addressed.

- First, the study relied on self report by respondents. There is no way to independently validate their actual behaviors.
- Second, the difference in setting may affect the validity of comparisons between the different socioeconomic levels.
- Third, lack of probability sampling decreases the ability to generalize about all children in the study area. Information was obtained for the upper and middle socioeconomic groups from those attending specific clinics. Such persons may or may not be representative of others in the community.
- Fourth, the results apply only to the environment of the study area (for example, urban, industrialized) and less so to rural areas of Latin America.

Despite these limitations, the data from the study allow us to better understand the current status of childhood safety in the study area and to design injury prevention strategies that are more likely to be successful. The major differences among the socioeconomic levels and the major deficiencies in safety in the lower level were for use of safety related devices and for transportation. These two categories overlapped for some of the most effective injury prevention strategies: seat belts, car seats, and bicycle helmets. Moreover, even for the upper and middle income levels, the use of safety related devices was below 50%.

Hence, a major implication of this study is the need to address the utilization of such devices. In some cases this may be done by social marketing measures. However, there is a need to consider the availability and cost of such items especially for people with limited economic resources. Some items, such as car seats, are available in stores in the study area, but may be priced beyond what most parents can afford. Other items may not even be available. Hence, there is a need to consider efforts to link up with manufacturers or merchants to make these more available to the public.⁴⁻⁷

We must also give special consideration to one of the main forms of injury related death among children in Mexico, pedestrian injuries.⁸⁻¹⁰ Our study only briefly touched on this issue. Educational efforts alone are not likely to be sufficient. We need to provide a safer infrastructure by roadway design and control of vehicle speed through heavily populated areas.¹¹⁻¹⁴

For all of the injury prevention activities that we might consider for Mexico and other Latin American countries, there is a need for sufficient human expertise and institutional capacity. There is a need to increase the number of professionals trained to deal with this problem from several different view points, including epidemiologists, clinicians, public health practitioners, lawyers, police, and engineers.

In conclusion, this study has provided baseline information on the current status of the knowledge and practice of childhood safety by parents in a Mexican city. There were notable differences among the social classes. There were also deficiencies in all groups for the use of safety related devices. Future injury prevention programs need to especially target such devices, including both knowledge of their importance by parents and their cost and availability to all members of the society.

Key points

- There were notable differences in the practice of childhood safety by parents in different socioeconomic groups in Monterrey, Mexico.
- Such differences were more pronounced for transport than for recreation or household safety and for use of safety related devices than for caution.
- Future injury prevention programs need to especially target such devices, including both knowledge of their importance by parents and their cost and availability to all members of the society.

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