Evaluation of a Culturally Tailored Educational Video Intervention to Promote Bike Helmet Safety for Urban Children: A Pilot Study

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*Bicycle-related falls are a significant cause of mortality and morbidity. Use of bicycle helmets substantially reduces risk of severe traumatic brain injury but compliance with this safety practice is particularly low in urban children. Given the lack of educational interventions for urban youth, our research team created a youth-informed, culturally relevant educational video on bike helmet safety, which was informed by focus groups with Baltimore City youth. This video, You Make the Call, linked the concept of use of cases to protect phones to use of helmets to protect heads and can be viewed at http://bit.ly/2Kr7UCN. The impact of the video as part of an intervention (coupled with a free helmet, fit instructions, and a parent guidance document) was tested with 20 parent–child dyads. The majority (80%) of youth (mean age 9.9 ± 1.8 years) reported not owning or wearing a helmet. At 1-month follow-up (*n *= 12, 60% response rate), helmet use was higher in the five youth reporting bike-riding after the intervention; 100% "always" used helmets compared to 0% preintervention. There were increases in youth reporting that parents required helmet use (35% pre vs. 67% post) and that is was possible to fall when bike-riding (60% pre vs. 92% post). These pilot results support the use of this video and educational intervention along with further evaluation in a larger sample size. This youth-informed and culturally tailored approach could be explored as a strategy to address other pediatric injury topics.*

Keywords: *injury prevention; safety, health disparities; health promotion; unintentional injury; injury; prevention; safety*

BACKGROUND

Bicycle-related falls are a significant cause of pediatric mortality and morbidity. Each year, nearly 325,000 children are treated in U.S. emergency departments for bicycle-related injuries; of these, 26,000 children sustain traumatic brain injuries (Centers for Disease Control and

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Prevention, 2011). The highest injury rate occurs in the 10- to 15-year age-group, and most bicyclist deaths occur in urban areas (U.S. Department of Transportation National Highway Traffic Safety Administration, 2013). Use of bicycle helmets is proven to reduce bicycle-related head injury by 63% to 88% and is associated with lower rates of severe head injury (Thompson et al., 1999). Despite this, less than half of children across the United States wear helmets when riding bicycles (Dellinger & Kresnow, 2010). One national study of children treated for bicycle-related injuries found that nearly 90% were not wearing helmets (Sullins et al., 2014). Additionally, disparities have been identified in helmet use. Specifically, helmet use has been shown to be lower among older children, minorities, and those insured by Medicaid (Sullins et al., 2014). Cultural differences in safety practices, lack of culturally tailored injury prevention messaging, socioeconomic gaps, and language barriers may contribute to these disparities (Brown, 2010).

Prevention programs prioritizing low income and minority communities may help increase helmet use in children (Sullins et al., 2014). Programs need to also address access barriers to using recommended products and following safe practices, for example, making bicycle helmets available when promoting their use. Similarly, the American Academy of Pediatrics advocates that counseling for the prevention of unintentional injuries should be "appropriate for the child's locale" (Gardner & and the Committee on Injury, Violence, and Poison Prevention, 2007). Studies of motor vehicle restraint programs suggest that the development of culturally tailored approaches can be effective in improving restraint use in at-risk populations. For instance, improvement in restraint use was demonstrated among African American children, teenagers, and adults after implementation of a culturally sensitive, faith-based motor vehicle injury prevention program (Falcone et al., 2006). These findings are promising and support the need to develop similarly oriented approaches for other injuries, including bicycle-related head injuries. Our review of publicly available educational videos and programs that promote bicycle helmet use for youth found that existing resources lack diversity in their participants and do not reflect the high-risk urban settings in which many of our patients live and ride bicycles.

AIMS

Given the lack of educational programs for urban youth, our research team created a youth-informed, culturally relevant educational video on bike helmet safety. The video was created based on input from focus groups with Baltimore City youth using methodology previously described (Ryan et al., 2019). The development of the video utilized theoretical constructs from social learning theory and the health belief model as well as principles of health equity with a goal of creating a prevention strategy that promoted youth empowerment and participation. In creating this video, You Make the Call, our team built a partnership with a local Baltimore public charter school and engaged youth in creating the content and filming. The video linked the concept of use of cases to protect phones to use of helmets to protect heads and won "Best in Show" from the National Health Information Awards (November 2018) and First Place—Short Video from the International Safety Media Awards as part of the 2018 World Injury Conference. The You Make the Call video can be viewed at http://bit.ly/2Kr7UCN. The goal of this study was to pilot test a bicycle helmet promotion program that included the You Make the Call video, a free bike helmet and fitting demonstration, and a parent guidance document (Figure 1) to reinforce helmet use. In this pilot study, we hypothesize that this youth-informed program will improve use of bicycle helmets and knowledge of bicycle helmet safety among at-risk urban youth.

METHOD

The pilot study was conducted at a large primary care clinic in an urban academic pediatric hospital in Baltimore, Maryland. This clinic provides primary health care services to approximately 8,300 infants, children, and adolescents with nearly 16,000 visits per year; patients are predominantly African American and almost 90% of patients are publically insured. The study was approved by the university's institutional review board.

Pilot Test

We recruited youth 8 to 15 years of age, and their parent/guardian, from the primary care clinic to participate during a pediatric visit. The safety educator in the primary care clinic approached potential participants to discuss the study and eligibility information. Youth who reported riding a bicycle within the past 6 months were eligible. Additional inclusion criteria included both youth and parents/guardians speaking and understanding English and same household residence for youth and parent/guardian. We obtained parent/guardian informed consent and youth assent from all participants. All study materials including the video, surveys, and consent/assent forms were in English.

After consent and assent were obtained, the youth completed a baseline preintervention survey of 16 questions. Each parent–child dyad then viewed the You Make

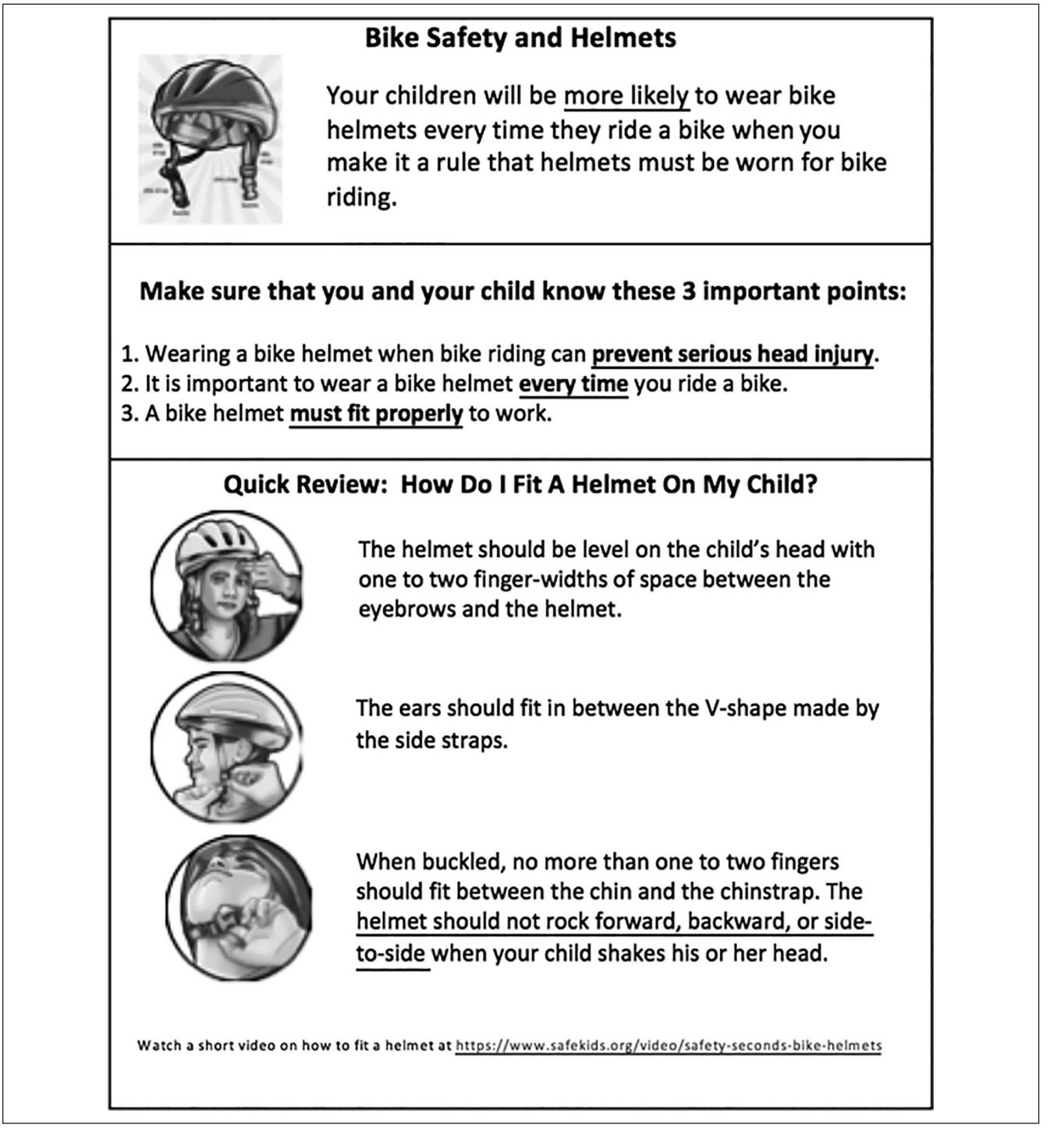

FIGURE 1 Parent Guidance Document

the Call video; the youth received a free bike helmet and fitting demonstration by a safety educator and parents received a one-page educational flyer that reinforced helmet use (Figure 1). After the intervention, the youth completed an immediate postintervention survey of four questions (in person, immediately after the intervention)

TABLE 1
Summary of Preintervention, Postintervention, and 1-Month Follow-Up Surveys

	Proportion of respondents with positive responses ("Yes" or "Yeah")		
Survey question	*Baseline preintervention* (n = *20*)	*Immediate postintervention* (n = *20*)	*1-month follow-up*[a] (n = *12*)
Do you think that bike helmets are uncomfortable to wear?	6/20		5/12
Do you think that bike helmets are ugly?	1/20		2/12
Do you think that it is cool to wear a bike helmet?	15/20		10/12
Do your friends wear bike helmets?	2/20		3/12
Do your parents wear bike helmets?	0/20		0/11
Do your parents make you wear a bike helmet?	7/20		8/12
Do you forget to put a bike helmet on when you ride?	9/20		7/12
Is it possible that you will fall when you ride your bike?	12/20	16/20	11/12
Can wearing a helmet when riding a bike prevent injuries to your head?	20/20	18/20	9/12
Is it important to wear a helmet when you are riding a bike?	19/20	20/20	12/12
Do you plan to wear your new bike helmet every time that you ride a bike?		20/20	

[a]No results were statistically significant at $p < .05$.

and a 1-month follow-up survey of 14 questions (by telephone, 1 month after the intervention). The baseline preintervention survey included questions on the age and gender of participants, frequency of the child's bike-riding, bicycle helmet ownership by the child, current bicycle helmet use by the child and adult, and the child's experience of injury during bicycle riding. The immediate postintervention survey included a question on intention to wear a bicycle helmet. The 1-month follow-up survey included questions on age and gender of participants, frequency of the child's bike-riding since study enrollment, and bicycle helmet use by the child and adult. The remainder of the questions for each of the three surveys assessed bicycle helmet safety knowledge, attitudes and behaviors (Table 1), using Likert-type scale response options. Positive responses were equated with "Yeah" or "Yes!" responses as opposed to "Absolutely No," "No," and "Not sure" responses. An incentive of $5 in gift cards was provided after the 1-month follow-up survey to survey participants who completed all three program (video, helmet/fitting, handout) and survey components. Univariate and bivariate statistics were used to describe the study sample and compare baseline preintervention to immediate postintervention and 1-month follow-up survey results using McNemar's test. A p value $<.05$ was established for statistical significance.

RESULTS

Pilot testing was completed in 20 parent–child dyads between September and December 2017. Results of the surveys are shown in Table 1. Enrolled youth had a mean age of 9.9 years (standard deviation [SD] ±1.8 SD) years and equal numbers of girls and boys participated. The majority (13/20, 65%) reported daily or weekly bike-riding; 80% (16/20) did not own a helmet and 80% (16/20) reported "never" wearing a helmet. In the immediate postintervention survey, 100% of study participants (20/20) self-reported intention to wear a helmet every time when bicycle riding.

At the 1-month follow-up (n = 12, 60% response rate), five youth reported bike-riding during the 1-month period since the intervention; of these, 100% (5/5) reported "always" using helmets compared to 0% on the baseline preintervention survey (p = .07). There were increases in youth reporting that their parents required helmet use (7/20, 35% pre vs. 8/12, 67% post, p = .25, reflecting 3/12 newly positive answers) and positive responses to the question, "Is it possible that you will fall when you ride your bike?" (12/20, 60% pre vs. 11/12, 92% post, p = .25, reflecting 3/12 newly positive answers). No notable differences were seen in peer helmet use or opinions on comfort/style of helmet.

DISCUSSION

Our pilot results support the use of this culturally tailored bicycle safety intervention along with further evaluation in a larger sample size. There was a trend toward an increase in youth reporting that they had always used a helmet in those who had been bike-riding during the month after the program. In addition, there were increases in parental requirement of helmet use and youth acknowledging the possibility of falling when riding a bike. These results are similar to studies of injury prevention counseling on helmet use and bicycle safety, which, in conjunction with helmet distribution, have been associated with positive outcomes in self-reported bicycle helmet use (Bishai et al., 2003). Given this, such tools hold promise to narrow the gap in reducing bike-related injury disparities for minority youth. In addition, the innovative video that served as the basis of our program will also have significant potential for dissemination and use in other primary care settings that serve similar populations.

This study has several limitations. First, the use of a single geographical site and exclusion of non-English speakers may limit generalizability of the results. Second, our survey results reflect self-report by a limited sample of the enrolled youth, which may affect accuracy of the responses. Direct observation was beyond the scope of this pilot study. Third, we did not assess injury during bicycle riding as a variable due to the short-term status of the follow-up period. Finally, our sample size was small for this pilot evaluation study, in which the follow-up time course included seasons less conducive to bike-riding, which likely explains the small proportion of youth reporting bike-riding during the 1-month follow-up period. More definitive testing of the program should be conducted in a larger study sample to ensure adequate statistical power, and the study should take place in spring and summer months when bike-riding is more common. Our results, when considered with the results of studies showing improvement in motor vehicle restraint use with culturally tailored prevention programs suggest that these strategies can be effective in injury prevention programs for at-risk populations.

IMPLICATIONS FOR PRACTICE

These pilot results support the use of this program and educational intervention to promote and increase helmet use along with further evaluation in a larger sample size of youth with similar sociodemographic characteristics and living in urban environments. This youth-informed and culturally tailored approach could be explored as a strategy to address other injury topics in pediatric primary care.

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