

Suicide and Violence Prevention: Parent Education in the Emergency Department

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ABSTRACT

Objective: To determine prospectively whether parental receipt of injury prevention education is associated with new action limiting access to lethal means and if so, what action was taken for which means. **Method:** Prospective follow-up of 103 adults whose children made an emergency department visit for mental health assessment or treatment. Record review assessed whether hospital staff provided injury prevention education. Logistic regression was used to determine the likelihood of new caretaker action limiting access to the following potentially lethal means: firearms, alcohol, prescription medications, and over-the-counter medications. **Results:** Significant associations were found between exposure to injury prevention education and action to limit access (adjusted odds ratio = 3.6, 95% confidence interval = 1.1–12.1, $p = .04$). Five of 8 adults whose households contained firearms took new action to limit access after injury prevention education, whereas none of the 7 firearm-owning families who did not receive injury prevention education took new action to limit firearm access. Similar patterns were seen for other means. Adults more often chose to lock up rather than dispose of lethal means. **Conclusions:** Injury prevention education should be provided to parents during child/adolescent emergency department mental health-related visits. Potential for violence prevention is real because parents do take new action to limit access to lethal means when means restriction education is provided. *J. Am. Acad. Child Adolesc. Psychiatry*, 1999, 38(3):250–255. **Key Words:** suicide, firearms, violence, injury prevention, adolescents.

A recommendation that health care professionals provide parents or adult caregivers with injury prevention information about “removing weapons and potentially lethal medications from the homes of adolescents who have suicidal intent” appears in the American Medical Association’s recently published guidelines for adolescent prevention services (1994, p. 3). However, little is known about whether this information is disseminated and if so, whether adult caregivers hear the message or take

action (Centers for Disease Control and Prevention [CDC], 1992).

Emergency departments (EDs) are a logical site for violence prevention. Often, children and adolescents who use EDs for mental health services are at risk for suicide or other-directed violence. Those who are at risk are often indistinguishable from those who have made actual suicide attempts (Swedo et al., 1991; Wislar et al., 1998). Thus, presentations for actual suicide attempts understate the number of youths who are at risk. In Oregon, the only state with mandated reporting of suicide attempts seen in EDs, the overall rate of suicide attempts presented to EDs was 197 per 100,000 young people aged 10 to 17 years during 1988–1993 (CDC, 1995).

Means restriction injury prevention education for adult caretakers is an adolescent suicide/violence prevention approach that is little studied (CDC, 1992; Potter et al., 1998). Some have even questioned whether injury prevention education is indicated in the case of ED visits for suicidal behavior (Dunn et al., 1993). Results conflict about the prevalence of injury prevention education. ED practitioners reported com-

Accepted September 16, 1998.

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These data were presented in part at the 43rd Annual Meeting of the American Academy of Child and Adolescent Psychiatry, Philadelphia, October 1996.

This research was supported by a grant from Ronald McDonald House Charities to Drs. Kruesi, Grossman, and Hirsch. The authors thank Cathy Mazur (Ronald McDonald House Charities), Sandy Dalton, and Robert Wintrobe (Riverside Medical Center) for their support and assistance.

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paratively high rates (ranging from 28% to 64%) of warning parents of suicidal youths to limit access to lethal means (Fendrich et al., 1998b). In contrast, an earlier study of parents making ED visits for their child's overdose attempt found that only 14% of parents reported being told to limit access to any form of lethal means and *none* reported being warned of the danger of firearms (McManus et al., 1997). This despite the facts that firearms are the most common means of completed suicide of adolescents (National Center for Health Statistics, 1996) and that presence of a firearm in the house increases homicide (Bailey et al., 1997; Kellermann et al., 1993) as well as suicide risk (Bailey et al., 1997; Brent et al., 1987, 1991, 1993a; Kellermann et al., 1992). It is encouraging that parents who reported receiving injury prevention education were significantly more likely to limit access to lethal means (McManus et al., 1997).

The apparent discrepancy between health practitioner (sender) and parent (recipient) reported rates raises questions: Do caretakers in the midst of a crisis-related ED visit actually hear the injury prevention message? Are the differences in reported rates due to differing sample characteristics between studies? Because none of the studies above examined sender and receiver reports of the same encounters, it is unclear what accounts for the discrepancy. Moreover, the association of injury prevention education and parental action might be a product of selective reporting by parents. Does social desirability reporting bias play a role? For example, are parents who did *not* take action to limit access more likely to deny having received the injury prevention education than those who did limit access? Independent verification from the provider report of the same encounter would resolve these concerns.

This study is the first to assess the success of extending the concept of means restriction education to violence prevention in general rather than limiting it to suicide per se. Extending the concept seemed reasonable when considering that significant overlap exists between risk of suicide and of other-directed violence (Garrison et al., 1993). Moreover, access to lethal means increases the risk of both self- and other-directed violence. The purpose of this study was to assess whether injury prevention education was associated with subsequent *new* action to limit access to lethal means and if so, what actions were taken.

METHOD

Participants

This study obtained its sample of participants from the ED of a Midwestern rural hospital. Eligibility for the study was composed of 3 elements. First, the child/adolescent (aged 6–19 years) had to have been accompanied by his or her parent/adult caretaker in the ED of the Midwestern rural hospital. Second, the ED visit had to include a mental health assessment as part of the emergency medical services provided. Mental health assessments are conducted at the request of the ED physician, usually when youths exhibit high-risk behavior such as suicidal or homicidal threats, running away from home, or other "out-of-control" behavior. Third, potential subjects were excluded if (1) there was no working telephone; (2) the parents did not speak English; or (3) the parent/caretaker and child/adolescent did not live in the same household, e.g., the child/adolescent resided in an institution.

Description of the sample ($N = 103$) demographics follows: 49% male and 51% female; mean (\pm SD) age, 13.7 (3.1) years; ethnicity, 74.5% white, 23.5% African-American, and 2% Hispanic.

Patients who received a mental health assessment were classified as either suicidal or nonsuicidal. Suicide-related ED visits were defined as behavior involving self-directed injuries (e.g., cutting, jumping, or falling from a height, drug overdose, etc.) or thoughts about self-injury or death (e.g., suicidal ideation or threats) (Birkhead et al., 1993). Other youths who received mental health assessments were termed nonsuicidal. However, the intent was to include children/adolescents who were at increased risk for suicide even if no mention of suicidal behavior or ideation was present.

Training Intervention

A 3-step intervention, termed *means restriction education* (Kruesi et al., 1995), was taught to staff providing mental health assessments in the ED. The goal of the means restriction education is to educate parents of at-risk youths to limit access to lethal means for suicide. Lethal means targeted were firearms, medications (over-the-counter and prescribed), and alcohol. Alcohol was included on the list of substances to limit access to because alcohol often facilitates suicide (Brent et al., 1987). To facilitate limiting access to firearms, a safe disposal mechanism for guns was arranged with law enforcement agencies covering the 5 counties served by the ED (see Fendrich et al., 1998a, for an example).

The content of the injury prevention education involved 3 main points: (1) informing parent(s), away from the child, that the child was at increased suicide risk and why the staff believed so (for example, "Adolescents who have made a suicide attempt are at risk for another attempt."); (2) telling parents that they can reduce risk by limiting access to lethal means, especially firearms; and (3) educating parents and problem-solving with them about how to limit access to lethal means.

Procedure and Description of Trained and Untrained Groups

ED staff were instructed to provide means restriction training to any parent/caretaker who brought in an at-risk child/adolescent and to note giving this information in the patient's chart ($N = 103$). We reviewed records from September 1, 1995, to April 30, 1996, to determine which child/adolescent met the inclusion criteria and which parent/caretaker received the means restriction information. While reviewing the charts, we discovered that of the children/adolescents who met the inclusion criteria, some parents/caretakers did

not receive the means restriction training, whereas others did. We labeled the sample of parents who did not receive the means restriction intervention the *untrained* or control group and the sample who did, the *trained* group.

For the exposed group, the mean (\pm SD) time from ED visit to the follow-up was 2.4 (1.7) months and the mean age of the child/adolescent was 13.6 (2.6) years. More than half of the children/adolescents were female (59%), and about 76% of the trained group were white. Sixty-eight percent of the trained group had suicidal ideation.

For the untrained group, the mean (\pm SD) time from the admittance to follow-up was 1.9 (0.9) months and the mean age of the child/adolescent was 13.5 (3.1) years. A majority of the children/adolescents were male (56%), and most of the unexposed group were white (72%). Fifty-seven percent of the untrained group had suicidal ideation (57%).

A structured telephone follow-up interview was conducted with the parents/caretakers of children/adolescents meeting inclusion criteria, regardless of whether or not the records indicated injury prevention education had been provided. Using an adaptation of the interview used by McManus et al. (1997), the interviewers described the study to the parents/caretakers, obtained their consent, and asked for information about their ED visit: Did parents/caretakers receive any information regarding means restriction while at the ED? At the time of their ED visit, were there any lethal means for suicide (prescribed drugs, over-the-counter drugs, alcohol, or firearms) in their homes? If so, did parents/caretakers take any preventive measures to limit access after the ED visit (new action)? Based on the adults' responses, 2 categories of new preventive action were created: locking and disposal. Locking was defined as putting the means in a locked storage container, such as a gun safe or locked medicine cabinet or rendering the means inoperative, e.g., a trigger lock for firearms. Disposal was defined as either elimination of the means, e.g., flushing medication down the toilet, or removing the means from the household, e.g., moving a gun to a relative's household in another state. The interviews took place an average of 2 months after the ED visit, with a range of 0.03 to 5.6 months.

Parents/caretakers were considered lost to follow-up when one of the following happened: (1) the parent/caretaker could not be reached after at least 4 attempts at different times and dates; or (2) the parent/caretaker decided not to participate. This investigation was approved by the University of Illinois at Chicago's institutional review board.

Data Analysis

Percent agreement and a Φ correlation coefficient were computed to assess the relationship between parents/adult caretakers who remembered receiving the means restriction education and the ED records indicating who received or did not receive the education. The Fisher exact test was used to compare agreement about having been exposed to means restriction training among the group that took action and the group that did not take action to limit access to lethal means.

To assess the impact of exposure to the means restriction injury prevention education, we limited analyses to households containing one or more of our 4 categories of lethal means. However, we anticipated that most households would contain one or more of our lethal means, as McManus et al. (1997) found that 94% of households contained one or more of the categories. To determine any sample bias, statistical analyses were performed first on demographics of subjects lost to follow-up and those successfully interviewed and then on

demographics of the trained and untrained groups. Chi-square or Fisher exact tests were used to compare categorical variables, and *t* tests were used for continuous variables.

A multiple logistic regression model (Hosmer and Lemeshow, 1990) was used to calculate the likelihood of parent/caretaker taking new action to restrict access to suicidal means associated with having received means restriction education after controlling for age, gender, ethnicity, suicidality, and time from the ED visit to follow-up. For this analysis, an inclusive definition of exposure was used. If either parent/caretaker report or hospital records indicated that a caretaker had received injury prevention education, the case was considered exposed to the education. Restricting access was defined as one or more new action(s), e.g., locking up or disposing of one or more categories of means (firearms, alcohol, prescription medication, and over-the-counter medication). From the model, adjusted odds ratios and 95% confidence intervals were calculated. The α level was set at .05 for all statistical tests. Descriptive statistics were used to describe what preventive actions were taken after leaving the ED. SPSS for Windows Version 6.1 (SPSS, Inc. Chicago, 1994) computed all statistical analyses.

RESULTS

One hundred three participants met the inclusion criteria: 62 parents/caretakers were not exposed to the means restriction (*untrained*), and 41 (40%) were trained according to patient records. Agreement about whether injury prevention education occurred was seen in 84% (61/73) of cases followed up. In 5 cases (7%), the parent reported receiving means restriction education which was not documented by hospital staff, and in 7 cases (10%) parents did not remember receiving injury prevention education which staff had documented. A significant correlation was found between sender and receiver accounts about whether means restriction training was provided ($\Phi = 0.66, p < .001$). Three households (3%) did not contain any of the 4 lethal means and were excluded from subsequent analyses as new action to limit means was not possible. Those who took action to limit means were less likely to agree with ED records as to whether they received training (33/42 = 79%) than those who did not take action (26/27 = 96%) (Fisher exact $p = .0397$). This goes against the social desirability hypothesis, which would suggest that people who did not take action (the socially undesirable action) would be more likely to deny having received training when ED records indicate they did.

Participants Lost to Follow-up and Participants Interviewed

Of the 100 participants who met the inclusion criteria and whose household contained lethal means, 30 were lost to follow-up. Statistical tests on the demographics between groups found no difference in age,

gender, or ethnicity. The lone significant difference was the percent of the group with suicidal ideation (χ^2 value = 5.8, $df = 1$, $p = .02$). Results indicated that the interviewed group had a larger percentage of children/adolescents with suicidal ideation than did the group that was lost to follow-up.

Comparison of the Trained and Untrained Groups

There were no significant demographic differences between the trained and untrained groups: age of the child/adolescent (independent t test value = 0.1, $df = 67$, 2-tailed $p = .9$); time (in months) from admittance to follow-up (independent t test value = 1.6, $df = 42.2$, unequal variances, 2-tailed $p = .3$); gender of the child/adolescent (male versus female, χ^2 value = 1.4, $df = 1$, $p = .2$); ethnicity of the child/adolescent (white versus nonwhite, χ^2 value = 0.1, $df = 1$, $p = .7$); child/adolescent having suicidal ideation (did have suicidal thoughts versus did not have suicidal thoughts, χ^2 value = 0.6, $df = 1$, $p = .4$); and availability of lethal means at the time of the ED visit (1 or 2 means versus 3 or 4 means, χ^2 value = 2.0, $df = 1$, $p = .2$).

Multiple Logistic Regression

An adjusted odds ratio and its 95% confidence interval were computed from a multiple logistic regression model that was composed of the following: lethal means (restricting/not restricting) as the dependent variable; means restriction education (trained/untrained) as the predictor variable; and age of the child/adolescent, gender (male/female), ethnicity (white/not white), suicidal ideation (yes/no), proportion of lethal means categories available, and time from ED visit to follow-up as the controlling variables. The model yielded an adjusted odds ratio = 3.6, and the 95% confidence interval = 1.1–12.1 ($p = .04$). Successful predictions of restricting lethal means and not restricting lethal means were 74% and 76%, respectively, resulting in an overall success rate of 75%.

New Action Taken to Limit Access to Lethal Means

New actions taken by parents to limit access to lethal means included locked storage and/or disposal of potentially lethal means (Table 1). Locking up was the most frequent new method of limiting access, with removal of the means from the household (disposal) less frequent. Despite the availability of a firearm disposal mechanism through local law enforcement, no guns were disposed

TABLE 1
Frequency and Percentage of Type of Action Taken to Limit Access to Four Classes of Lethal Means by "Trained" and "Untrained" Groups

Lethal Means	Trained Group		Untrained Group	
	<i>n</i>	%	<i>n</i>	%
Prescribed medication*				
No action taken	6	25	17	52
Locked up	10	42	8	24
Disposed	8	33	8	24
Total	24		33	
Over-the-counter medication*				
No action taken	14	52	28	78
Locked up	7	26	5	14
Disposed	6	22	3	8
Total	27		36	
Alcohol				
No action taken	7	54	8	89
Locked up	5	39	0	0
Disposed	1	8	1	11
Total	13		9	
Firearms*				
No action taken	3	38	7	100
Locked up	3	38	0	0
Disposed	2	25	0	0
Total	8		7	

* Chi-square or Fisher exact test for action (locked up + disposed = action) vs. no action taken by "trained" vs. "untrained" significant at $p \leq .05$.

of via this route. Telephone follow-up interviews with law enforcement agencies verified this. Training in means restriction was significantly associated with new action limiting access to firearms, prescription and over-the-counter medication, but not alcohol (respectively, Fisher exact = 0.026, 0.007; $\chi^2 = 10.2$, $df = 1$, $p = .001$; Fisher exact = 0.165).

DISCUSSION

Trained parents were more likely to take action to limit access to lethal means. This is consistent with our earlier findings that caretakers of suicidal adolescents who reported being educated in the ED about injury prevention took action to limit access to lethal means, whereas caretakers not educated about means restriction were significantly less likely to do so (McManus et al., 1997). Our finding that injury prevention education for parents whose child received ED mental health assessment resulted in limitation of access to lethal means, controlling for presence/absence of suicidal ideation, offers evidence that means restriction education has

potential for violence prevention as well as suicide prevention.

The significant correspondence between documented practitioner report and parent/caretaker account indicates that parents do hear the means restriction message. It also suggests that social desirability reporting bias is unlikely to account for the relationship between receipt of injury prevention education and action to limit access. Moreover, the low rate of caretaker-reported episodes of means restriction that were undocumented is also consistent with the idea that if an episode is not documented, it is unlikely to have occurred.

Our study is consistent with conclusions that more interactive and intensive strategies are needed to change practitioner behavior (Davis et al., 1995; Fendrich et al., 1998b). A previous study at the same site concerning a demographically similar sample from 1994 found no documented instances of injury prevention education (Wislar et al., 1998). Thus, our 40% rate following in-person and interactive training is a substantial increase. Thus, in-person training appears more encouraging than a recent mail education campaign about means restriction (Fendrich et al., 1998b). Although the mailing was associated with increased knowledge about limiting access to firearms for adolescent suicide prevention by ED-based physicians and nurses in the city targeted for the mailing, it did not result in a significant increase in practitioner report of rates of providing injury prevention education to parents.

This study has limitations. Ethical concerns at the site dictated that random assignment was not part of the design. The intention was for all caretakers of children meeting inclusion criteria to receive the injury prevention education. Comparison of those trained in injury prevention education and those not trained did not reveal any significant demographic differences. However, we cannot rule out differences between groups in their storage of potentially lethal means prior to the ED visit as we did not systematically assess prior storage. Nonetheless, we asked specifically about *new* actions to restrict access. Future studies will need to assess storage conditions of firearms and other lethal means that existed prior to the education opportunity. The number of households containing guns in this study is comparatively small. Only 21% of households reported one or more firearms. In comparison, federal agencies report almost half the households in America contain firearms (U.S. Department of the Treasury, 1991), and a pediat-

ric practice-based sample reported 37% of 5,233 families had a gun in the household (Senturia et al., 1996). However, the 21% figure is very comparable with the 25% rate in a study of adolescent suicide attempters who made ED visits (McManus et al., 1997).

Our results support a parental preference for locking up rather than disposing of lethal means. A recent mail survey of 979 pediatricians and family physicians found physicians perceive that parents are rarely receptive to advice about removing guns from the home, but a substantial majority believe parents would be amenable to storing firearms locked and separately from ammunition (Grossman et al., 1995). A study of 215 parents in Maryland pediatric practices found that 70% of parents reported being "very likely" to keep guns unloaded and locked up if informed to do so by their pediatrician, but only about 15% would remove a gun from the home (Webster et al., 1992). Our findings are consistent with both physician perception and parental focus groups. Unlocked storage of firearms is prevalent. Surveys of gun storage patterns find 41% to 64% of firearms are unlocked (Bowling, 1985; CDC, 1989; Harris, 1993; Senturia et al., 1996; Sienko et al., 1991; Weil and Hemenway, 1992). Thus, there is great room for improvement. Our data indicate that recent calls for improvement in limiting access of at-risk youths to firearms (Berman et al., 1998; Christoffel, 1998) can be achieved.

Clinical Implications

Our data add to the growing evidence that psychoeducation aimed at parents whose children have mental disorders is beneficial (Beardslee et al., 1997; Brent et al., 1993b). We need to incorporate family into the planning of prevention efforts (Potter et al., 1998). Many health professionals (Fendrich et al., 1998b; Weissberg, 1990) and parents of youths at suicidal risk are untrained in handling psychiatric emergencies and/or restricting access to lethal means. Most adult caretakers will act to limit access if we instruct them. As child and adolescent psychiatrists, we must instruct parents and urge our health professional colleagues to educate parents of youths at risk about limiting access to lethal means.

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