

Catherine F. Lewis,¹ M.D.; Madelon V. Baranoski,² Ph.D.; Josephine A. Buchanan,² B.A.;
Elissa P. Benedek,³ M.D.

Factors Associated with Weapon Use in Maternal Filicide

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ABSTRACT: The objective of this study was to identify factors associated with weapon use in a group of filicidal women. Clinical data were gathered from the charts of sixty filicidal women evaluated at Michigan's Center for Forensic Psychiatry or through Connecticut's Psychiatric Security Review Board from 1970 to 1996. Factors associated with weapon use were determined using chi squares, ANCOVAs, and a logistic regression. Results were compared to national statistics for child homicide from the Department of Justice Uniform Crime Reports (UCR). Weapon was defined as knife or gun for the study. Weapons were used by one of four women in our study. Guns were used by 13% of filicidal women and knives by 12%. Odds ratio showed that psychotic women were eleven times more likely to kill their child with a weapon than their non-psychotic counterparts (11.2; $p = .008$). Psychosis was present in every mother who killed her child with a knife and in seven of eight women who killed their children with a gun. Younger children were less likely to be killed with weapons (ANCOVA; $F = 8.28$; $p = .006$). This finding was independent of presence or absence of maternal psychosis. These results show that psychotic women are more likely than non-psychotic women to kill their children with weapons. They also show that mothers are more likely to use weapons to kill older children than younger children.

KEYWORDS: filicide, weapon, maternal, psychosis, neonaticide, infanticide, mother

Maternal filicide, defined as the murder of a child by its mother, has been reported for centuries in many different cultures (1–8). Within the United States, mothers who murder their children have received considerable attention from the media. Despite public fascination with the topic, the development of research on filicidal women has been relatively recent. Authors have noted that the methods and motivations of filicidal women are diverse (6,9–14). The literature has had a resultant focus on categorizing and describing women who kill their children.

Resnick authored the first extensive review of filicide in 1969 (6). His paper reviewed the world literature and categorized eighty-eight filicidal mothers into categories based on perceived motive. His categories for filicide included: altruistic (women who killed

their children to relieve real or imagined suffering), accidental (women who beat their children to death or killed them by accident), revenge (women who killed to retaliate against their spouse), unwanted child (women who killed children who were not wanted), and acutely psychotic (women who killed without a clear motive). Resnick differentiated neonaticide, the homicide of a child less than 24 hours of age, from filicide (15). He noted a tendency of neonaticidal women to be younger, have less psychiatric history, fewer psychotic symptoms, less tendency to confess, and more likelihood of killing their baby because it was unwanted. Subsequent authors have focused attention on categorizing filicidal women and have offered modifications of Resnick's system of classification (10,12).

Filicidal women kill their children using diverse methods. There is no prototypical murder of a child by its mother, and bizarre methods have been described (6,15,16). These have included injecting air into the fontanel of newborns (16), biting a child to death (17), forcing a child to eat pepper (18), and overdosing an infant on morphine rubbed on the nipples of the mother (15). Despite the diversity of methods used to kill children, there have been few formal investigations of what factors influence method of killing among filicidal women. Differing observations have been made about methods used by mothers to kill children. In general, weapon use has been found more commonly among women killing children older than one year versus those less than one year of age. In comparing filicidal mothers and fathers, Resnick noted that filicidal women tend to use more passive means of killing (e.g., smothering, drowning, gassing) than filicidal men (stabbing, striking, squeezing) (6,15). Some studies have supported this observation (9,19,21). Others have observed a high rate of battering deaths among victims of maternal filicide (10). Because the various studies are drawn from different countries and settings (prison, forensic hospital, psychiatric hospital, etc.), it is difficult to generalize findings from study to study.

Weapon use among filicidal women has received scant attention. This may be due, in part, to the overall lower incidence of weapon use and of homicide for women versus men (23). In addition, previous studies on filicidal women have been from world literature (6,15), Canada (11,12,22), Hong Kong (14), and Great Britain (10). Incidence of firearm use is lower in all of these countries than in the United States, and review of data from these countries may suggest a lower incidence of weapon use than would be found in the United States (23). In several samples from outside of the United States, there were no firearm deaths at all among young victims of filicide (9,10). In the one sample drawn from the world

¹Assistant professor, William S. Hall Psychiatric Institute and University of South Carolina, Columbia, SC.

²Associate professor and research associate, respectively, Yale University, New Haven, CT.

³Clinical professor, Center for Forensic Psychiatry, Ann Arbor, MI.
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literature which included American men and women, mothers killed their children with guns as frequently as fathers (in 9% of the cases). Knives were used in 9% of maternal filicides and 14% of paternal filicides (6). In other words, in the sample, women used a gun or knife to kill their children in about one of every five deaths. Although this group is a minority among all filicidal women, the factors associated with their unusual choice to use a weapon is of interest.

Although some authors have suggested that psychotic filicidal women may use weapons more frequently than their non-psychotic counterparts (10,11), we are not aware of any report of systemic investigation of this issue. D'Orban divided knife use among the categories of women in his British sample (10). There were no instances of shooting deaths in his study. He observed that "Mentally III" mothers (those who were psychotic) were responsible for three of four stabbing deaths. The possible link between psychotic symptoms and weapon use has not been explored further.

The present study will attempt to determine what factors are associated with the use of a weapon (knife or gun) in a large sample of women from the United States who killed their children. It will also compare patterns of weapon use between filicidal women and the general population in the United States who killed children under the age of 18 years. We hypothesize that psychotic women will use weapons more frequently than their non-psychotic counterparts. We also hypothesize that older children will be killed with weapons more frequently than younger children and that, when younger children are killed with weapons, the mothers are more likely to be psychotic. We expect a lower frequency of weapon use among mothers killing their children than among the general population committing child homicide.

Methods

Sample

The study population consisted of fifty-six women evaluated at the Center for Forensic Psychiatry in Ann Arbor, Michigan and four women evaluated through the Psychiatric Security Review Board in Hartford, Connecticut. The Michigan group was drawn from the entire state of Michigan and represented all cases referred to the Center for Forensic Psychiatry for evaluation of competency to stand trial and/or criminal responsibility. The Connecticut group was drawn from the entire state of Connecticut and represented all cases of filicidal women found not guilty by reason of insanity. The years covered in this study were 1970 to 1996 for both the Connecticut and Michigan groups. Demographic data were collected through extensive chart review for all cases. A descriptive analysis of the data was performed.

Data Analysis

Divisions of victim age were made in accordance with those from the Uniform Crime Reports (under 1 year, 1–4.9 years, 5–9.9 years, 10–14.9 years, 15–18 years, over 18 years) (23). Method of homicide was divided into knife, gun, strangling/smothering, beating and other. The methods corresponded to categories described in the Uniform Crime Reports as much as was possible given the limitations of the sample size. Specifically, the categories strangulation and asphyxiation were collapsed into one category. The category of "blunt object" was eliminated because there were no women in the sample who used blunt objects to kill their offspring. The category "other" encompassed several categories in which there were small numbers of perpetrators or the method

was not described in the Uniform Crime Reports (killing with an automobile, burning, poisoning, drowning, pushing out windows, neglect/starvation).

The data were processed using SPSS 5.0 for UNIX. Chi squares and ANCOVAs were computed to assess what factors were significantly different between women killing their children with a weapon versus those killing their children without a weapon. The method of homicide was collapsed into two categories, weapon (gun or knife) and other (all other methods), in order to analyze relationship between sample characteristics and weapon use. Factors assessed included: age of mother, level of mother's education, mother's employment status, presence of hallucinations, presence of delusions, presence of psychosis, and sex of victim.

The second phase of data analysis involved performing a logistic regression to assess whether the presence of maternal psychosis and age of the victim were independently related to weapon use.

Results

Demographics

The sample was comprised of 60 women with a mean age of 29.05 years \pm 8.15 years, a median age of 28 years, and an age range of 17–52 years. Caucasians made up 60% of the sample, African Americans 38%, and Asians 2%. There was a high incidence of unemployment (81%) among women at the time of their alleged crime. Thirty percent of the sample were married and 56% had completed a high school education.

Psychiatric symptoms were reported in a significant number of women. A majority of women had a history of previous psychiatric treatment (60%), delusions (55%), psychotic symptoms (65%), and positive family psychiatric history (55%). The most common diagnosis was schizophrenia (30%) followed by schizoaffective disorder/bipolar disorder (20%) and personality disorder (20%). A minority of women had a history of substance abuse (30%) and only 3% were reported to be using substances at the time of their alleged crime. Only 15% of the sample had been arrested previously. A majority (52%) were found incompetent to stand trial and an even higher percentage found not guilty by reason of insanity (65%).

A total of 76 victims were killed by the sixty mothers. Of these victims, 45% were male and 55% female. Mothers killed two children in eight instances and three children in four instances. The victims had a mean age of 4.21 years with a standard deviation of 5.35 years, median age of 2.50 years, and an age range of birth to twenty-six years.

Factors Related to Weapon Use

Chi-square analysis was carried out to determine what characteristics of the mothers and victims were related to weapon use. Table 1 shows the results of chi-square analysis for weapon use by victim and maternal characteristics. As shown in the table, sex of victim and maternal education were not related to weapon use.

Factors that were significantly related to weapon use included employment status (Chi-square = 7.15; $df = 1$; $p = .014$), presence of hallucinations (Chi-square = 5.16; $df = 1$; $p = .05$), presence of delusions (Chi-square = 8.54; $df = 1$; $p = .003$), and presence of psychosis (Chi-square = 11.20; $df = 1$; $p = .008$). The results showed that women who used weapons to kill their children were more likely to be unemployed, to have hallucinations and delusions, and to be psychotic than women who killed their children without using weapons. For the purpose of further

TABLE 1—Chi-square analysis of factors related to weapon use.

Characteristics	Weapon (Gun, Knife)	Other	Chi-Square Chi-sq (df) p
Sex of Victim			
Males	7	20	NS*
Females	8	25	
Age of Victim			
Less than 1 year†	2	19	No analysis‡
1 to 4.9 years	2	19	
5 to 9.9 years	6	5	
10 to 14.9 years	1	1	
15 to 19.9 years	3	1	
20 and over	1	0	
Maternal Characteristics			
Education			
Less than HS	6	20	NS
HS Graduate	6	16	
Post High School	3	9	
Marital Status			
Married	3	15	No analysis
Single	4	17	
Separated	2	4	
Divorced	5	8	
Widowed	1	1	
Employment			
Employed	0	9	7.15 (1) .017
Unemployed	14	35	
Hallucinations			
None	5	25	5.16 (1) .05
Present	9	18	
Delusions			
Present	13	24	8.54 (1) .014
None	2	20	
Psychosis			
Present	14	25	11.20 (1) .008
None	1	20	

**p* value greater than 10.

†Age groups from the National Institute of Justice.

‡Chi-Square analysis prohibited because of sample size.

analysis, psychosis was identified as a primary variable encompassing the other characteristics of delusions and hallucinations.

Weapon Use in Psychotic and Non-Psychotic Women

The methods used in the filicides are listed in Table 2 for the total sample ($n = 60$), psychotic mothers ($n = 39$), and non-psychotic mothers ($n = 21$). The distribution of weapon use varied by the factor of maternal psychosis. Although 25% of the total sample used a gun or a knife, 36% of the psychotic mothers used these weapons compared to only 5% of the non-psychotic mothers. Psychotic women were the perpetrators of seven of eight filicides involving a gun and in all seven filicides involving knives. Because sample size prohibited chi-square analysis across weapon/method categories, only percentages are reported.

A calculation of the odds ratio (OR) assessment for the likelihood of weapon use with a psychotic mother was carried out and is shown in Table 3.⁴ The odds ratio shows that psychotic mothers are 11.2 times more likely than non-psychotic mothers to have used a weapon to kill their children.⁵

⁴Because in this sample all children were killed, the odds ratio presents a likelihood that a weapon was used by a psychotic mother compared to a non-psychotic mother, *given a death has occurred*. The nature of this sample, with child mortality being an inclusion variable, alters the usual interpretation of odds.

⁵The wide confidence interval (1.42–496.76) indicates that for future samples, the exact estimate of risk is very likely to vary.

TABLE 2—Distribution of methods of homicide for total sample and psychotic and non-psychotic mothers.

	Gun <i>N</i> = 8		Knife <i>N</i> = 7		Strangling/ Smothering <i>N</i> = 18		Beating <i>N</i> = 8		Other <i>N</i> = 19	
	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Total Sample (<i>n</i> = 60)	8	13%	7	12%	18	30%	8	13%	19	32%
Psychotic Mothers (<i>n</i> = 39)	7	18%	7	18%	10	26%	2	5%	13	33%
Non-Psychotic Mothers (<i>n</i> = 21)	1	5%	0	0%	8	38%	6	29%	6	28%

Other Methods Include: Burns (5%).
Poisoning (2%).
Drowning (8%).
Falls (4%).
Motor/Vehicle (2%).
Neglect/Starvation (12%).

TABLE 3—Odds ratio (OR) estimate of weapon use by maternal psychosis.

Maternal Psychosis	Weapon Use		95% CI	<i>p</i>
	Yes	No		
	14	25		
	1	20		
OR (odds ratio)	11.20		1.42–496.76	.008

Weapon Use and Age of Victim

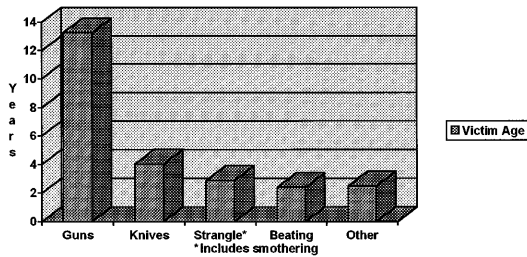
Age categories that corresponded to the Uniform Crime Reports were used to describe the distribution of victims. Although chi-square analysis was prohibited because of sample size across these categories, Analysis of Covariance (with a covariate of maternal age) showed that the age of victim varied significantly across the five methods used by filicidal mothers. Results are summarized in Table 4. The ANCOVA showed a significant difference in the age of children killed by different methods ($F = 6.72$; $p = .000$). Post hoc analysis by the Tukey HSD test showed that children killed with guns were significantly older than children who died from any other method. Children who were killed with knives were significantly older than children who were killed by all methods other than guns. Children killed by strangling, beatings, or other means did not differ significantly in age. Controlling for victim age, maternal age did not vary across weapon use (F (ANCOVA) = .078; $p = .781$).

In order to examine the interaction among maternal psychosis, age of victim, and weapon use, an ANCOVA with maternal age as a covariate was conducted. The results are summarized in Table 5. To avoid empty cells in the analysis, weapon use was entered as a bivariate variable of “weapon” or “other.” Controlling for maternal age and maternal psychosis, children killed by weapons were significantly older than children killed without a weapon ($F = 8.28$; $p = .006$). However, controlling for maternal age and weapon use, children killed by psychotic mothers did not differ in age from those killed by non-psychotic mothers ($F = 22$; $p = .645$). There was a significant interaction between maternal age

Table 4

Distribution of Victim Age Across Weapon Categories
Summary of ANCOVA

Mean Age of Victim Across Weapon Categories



Summary of ANCOVA

Source of Variance	Sum Squares	DF	F	p
Covariate (Maternal Age)	709.09	1	58.58	.000
Main Effects (Weapon)	325.27	4	6.72	.000
Explained	1034.35	5	17.09	.000
Residual	653.67	54		

Post hoc Analysis (Tukey HSD Test)
P Level of Significance

Weapon Category (Mean Age)	Guns	Knives	Strangling	Beating	Other
Guns (13.25)	----	.000	.000	.000	.000
Knives (4.02)		----	.042	.036	.039
Strangling (2.88)			----	NS ¹	NS
Beating (2.39)				----	NS
Other (2.49)					----

¹ Not significant at p = .05 level.

and weapon use: psychotic mothers used weapons on children regardless of age while non-psychotic mothers did not use weapons to kill young children.

In order to examine the combined influence of victim age and maternal psychosis on weapon use, a logistic regression modeled the two factors on weapon use. Table 6 shows the results of the analysis. Victim age, entered in years, was a risk factor associated with weapon use ($p = .004$). Independent of maternal psychosis, for each year increase in victim age, there was a 25% increase in risk that a weapon will be used. Independent of victim age, psychotic mothers are 8.85 times more likely to use a weapon compared to non-psychotic mothers ($p = .069$). Although an interaction between victim age and maternal psychosis on weapon use was not significant, the sample size limited the power to demonstrate interaction.

Comparison to UCR Data on Weapon Use in Murders of Children Less Than 18

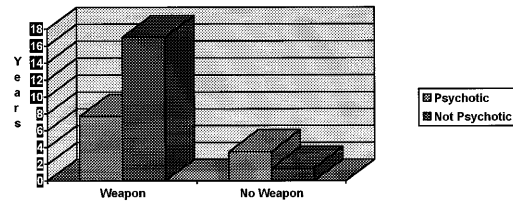
Weapon use was also examined in comparison to UCR statistics for homicides of children under 18 in the United States. Figure 1 shows the percent of victims under 18 killed by various methods. The categories of method are those reported by the UCR (23). The three distributions include the UCR data (solid bar), psychotic women from this study (hatched bar), and non-psychotic women from this study (circle bar).

Weapon use patterns for filicidal women did not match general

Table 5

Distribution of Victim Age By Maternal Psychosis and Weapon Use
Summary of ANCOVA

Mean Age of Victim By Maternal Psychosis and Weapon Use



Summary of ANCOVA

Source of Variance	Sum Squares	DF	F	p
Covariate (Maternal Age)	678.33	1	53.66	.000
Main Effects	105.30	2	4.16	.021
Weapon	104.69	1	8.28	.006
Maternal Psychosis	2.72	1	0.22	.645
Interaction	55.26	1	4.37	.041
Weapon X Psychosis				
Explained	838.90	4	16.59	.000
Residual	682.65	54		

Post hoc Analysis (Tukey HSD Test)
P Level of Significance

Weapon X Psychosis (Mean Age)	Psychotic	Non-Psychotic
Weapon	~13.25	~4.02
No Weapon	~2.88	~2.39

TABLE 6—Relationship of victim age and maternal psychosis on weapon use logistic regression.

Variables	Beta (S.E.)	OR (Odds Ratio)	95% CI	p
Age	0.22 (0.08)	1.25	1.07–1.45	.004
Maternal Psychosis	2.18 (1.20)	8.85	0.84–92.94	.069

homicide patterns reported in the UCR. Gun use is lower in both psychotic and non-psychotic filicidal women (under 20%) compared to the national statistics of greater than 60%. In contrast, knife use occurred in 18% of the psychotic filicidal mothers but only 7% of the homicides from the UCR sample.

Discussion

This study is among the first of a large group of filicidal women within the United States. It is also among the first to examine what factors influence the use of a weapon in maternal filicide. The major findings of the study are that older children are more likely to be killed with weapons than younger children and that psychotic women are more likely to use weapons than non-psychotic women to kill their children. A related and unexpected finding was that, when psychotic women used weapon to kill their child, they were about as likely to pick a knife as a gun. These findings have important implications for the understanding and prevention of some maternal filicides.

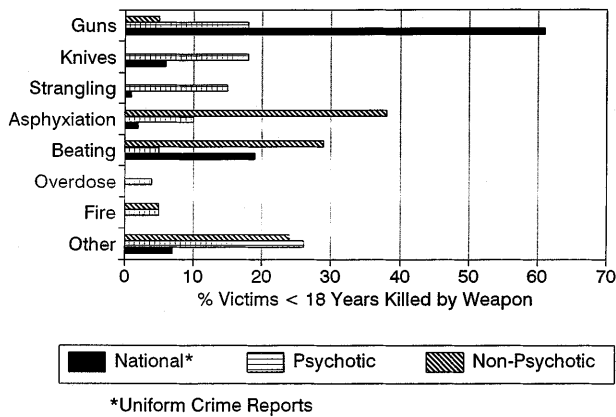


FIG. 1—Percent victims <18 year old killed by a weapon.

The finding that older children are more likely than younger children to be killed with weapons is in accordance with previous observations in the literature. Specifically, it is consistent with observations that the murders of the youngest children, neonates, rarely involve weapons (6,11,15). It also fits with previous observations that the youngest children tend to be beaten to death, smothered, drowned, and strangled (6,10–15). One possible explanation is that it is easier to kill younger children without the use of a weapon. Smothering, for example, would be far more difficult with a ten-year-old versus a neonate.

While this explanation has merit, it does not address the women who kill young children (under age 10) with weapons. We found every member of this group to have psychotic symptoms. In a majority of cases, there were delusions specifically about the victim which the mother described as terrifying. For example, one woman stabbed her infant 45 times because she had become convinced that the baby was possessed by the devil. It is not surprising that a mother, when confronted with a force which she believes is overpowering, uses a weapon rather than her own strength to confront it. Our study shows that the women who killed the youngest children with weapons were uniformly psychotic and a majority had command hallucinations and paranoid delusions. These symptoms have been identified as risk factors for dangerousness in the general population (24,25) and should be given equal weight when dealing with psychotic mothers. Delusions and paranoia directed at the child should be given particular attention (26,27).

The finding that psychotic women were more likely to use weapons than non-psychotic women also substantiated anecdotal observations from previous studies (6,10,11). The tendency for psychotic women to use more weapons was independent of age of victim. In our study, 36% of all filicides by psychotic women involved the use of a knife or gun. Non-psychotic women used a weapon in only 5% of the filicides. Non-psychotic women have been observed to use methods which can be viewed as extreme and sometimes grotesque extensions of normal punishment or expression of frustration (6,27,28). Examples would include the 25 year old who beat her child to death after long-standing abuse by “accident” because the child wet its pants or the 17-year-old who smothered her newborn because she “couldn’t stand to hear him cry any more.” The use of weapons by psychotic mothers was rarely related to punishment or frustration. Most frequently, it related to delusions involving the child being in danger or the child itself being dangerous (6).

The women who used a weapon were about as likely to use a knife as a gun. This is in sharp contrast to UCR data for homicides of children under the age of 18 which showed a much higher rate of murder by firearm (23). Several explanations are possible. First, the UCR statistics include homicides from outside the family. Specifically, gang related killings and killings occurring in the commission of another crime are included. Second, the vast majority of filicides occur inside the home. Knives are readily available in most homes and easily accessible to even a disorganized killer. Knives are easy to use and most people have handled them frequently. Finally, mothers who kill their children kill younger victims than the general population killing victims under 18 years of age. In the UCR sample, most victims were over 15; in our study, the modal victim age was 2.5 years. Within the UCR group, the ratio of knife to gun killings increases with decreased victim age. It is highest in infant homicides where it is 1:3 (23). The youth of the filicide victims may have some relationship to the high percent of women using knives to kill their children.

Our study found that filicidal women used weapons one quarter of the time. Although women who kill their children with weapons represent a minority of filicidal mothers, they may be a group particularly amenable to efforts at prevention. The women who killed with weapons have high rates of psychotic symptoms including hallucinations and delusions. These symptoms can be identified, monitored, treated and assessed by astute clinicians. The majority of women who used weapons to kill their children had had past psychiatric treatment and about three quarters were in treatment at the time of the filicide. More than half had expressed fears about their children to family or clinicians and about an eighth had contacted the police. These findings are in accordance with previous observations that a significant number of filicidal mothers have expressed concern to mental health providers preceding their crime (6).

In one case from our study, a divorced mother of two called her family three times complaining that someone was going to kill her daughters. She was picked up by the police wandering with her children. She expressed fears that her children would be killed to the police. She was evaluated in a psychiatric clinic and prescribed medication for psychosis. The following night she stabbed both daughters to death. In another instance a woman stabbed her infant son while on hold to speak with her psychiatrist. She had expressed vague concerns about her son’s safety in sessions during the preceding week. These cases underscore the difficulty in reading cues from filicidal women. Educational efforts should be directed not only at mental health professionals, but police, emergency room physicians, general practitioners, pediatricians, child protective service personnel, and family members. Because many psychotic women who kill their children have not had abused their children in the past (6), programs aimed at preventing child abuse may not target them effectively.

Recognition of women at risk to kill their children with weapons may be enhanced by developing more structured methods of assessing maternal feelings related to children. Such feelings can be particularly challenging for psychotic patients to articulate and for clinicians to elicit. Education of clinicians about the spectrum of filicide and patterns of presentation among filicidal mothers would also be of benefit. For example, even experienced clinicians may not ask a mother if she ever has feelings of fearing her child or being fearful for her child. Such questions could be helpful in identifying children at risk. Possible other tools could include structured interviews designed to assess mothers’ feelings about

their children, ability to care for children, and fears related to children. Clinical observations of mother and children together over significant periods of time and home visits are other methods for enhancing awareness of children at risk for maternal filicide. Frequent and specific questions related to children can also help the clinician recognize mothers at risk for maternal filicide. At least one study has reported success in treating mothers and children at risk within a hospital setting where they were kept together (28). Lastly, given the increased risk for children of psychotic mothers to be killed with weapons, medication compliance and aggressive treatment of psychotic symptoms in mothers can be seen as integral in reducing the risk of weapon related filicide. These suggestions focus on prevention of weapon related filicide deaths. Further investigation is needed to address prevention for other subgroups of filicidal women. What is clear is that filicidal women use heterogeneous methods to kill their victims, and that effective prevention methods are likely to be heterogeneous as well.

Our study, although large among studies of filicidal women, was limited by the number of subjects in it. For example, because of limited sample size, we were unable to perform chi-square analysis across weapon/method categories. Some findings found to be of marginal significance may be significant in a larger sample. For example, the fact that only one non-psychotic mother used a weapon and that psychotic mothers used weapons across the victim age categories suggests the possibility of an interaction which would be demonstrated with a larger sample. Our study was also limited by the fact that the subjects were drawn from only two states (Connecticut and Michigan) and were drawn from a population which had been referred for psychiatric evaluation. It is possible that the rates of psychosis, weapon use and other factors may vary significantly in filicidal women from other geographic or institutional settings (i.e., prison versus psychiatric hospital versus jail). Further investigation across settings is necessary to characterize the general population of filicidal women.

Our study found that psychotic women used weapons more frequently than non-psychotic women to kill their children. The risk of being killed with a weapon increased with a child's age. The phenomenon of psychotic women killing young children with weapons is one which warrants further investigation in a larger sample. Further research should be done on what factors determine method of filicide and how these factors could be addressed in an effort to prevent the death of children.

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Additional information and reprint requests:

Catherine F. Lewis, M.D.
4824 Smallwood Road
Apartment 102
Columbia, South Carolina 29223