Original article

Trends in suicide, parasuicide and accidental poisoning in Children in Addis Ababa, Ethiopia

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Abstract: Due to lack of compiled data on suicide, parasuicide and accidental poisoning (AP) in under-fifteens in Addis Ababa, Ethiopia, it was essential to prepare and analyze these basic data. By using estimated mid-year population for 0-4 and 5-14 years age groups and fiscal year morbidity and mortality data reports, age and sex-specific suicide, parasuicide, and AP rates (per 100,000) are, calculated for 1981/82-1995/96. No suicide deaths or 'undetermined' deaths were reported in underfifteens, but 12 deaths were recorded in the two pediatrics hospitals of Addis Ababa following admissions for AP. Out of 479 reported parasuicide cases, 402(83.9%) were in the age group of 514 years and the average parasuicide rate for the same age group was 6.74 and 5.32 for boys and girls, respectively. The trends of the reported parasuicide rates showed small peaks initially in 1981/82 in both age groups, but after 1990/91 only the age group of 5-14 showed peaks. Out of 939 cases of AP,533 (56.8%) were in the age group of 0-4 years and the rest in the age group of 5-14. Males in the age group of 0-4 have the highest AP rate (19.91%) followed by females (12.60%) of the same age group. Possible reasons for changes in trends and preventive measure are discussed. [*Ethiop. J. Health Dev.* 1999;13(3):263-269]

Introduction

Despite generations of social concern, research and legislative actions pertaining to the health and welfare of children and adolescents, their major health and mental health needs are not yet being met world-wide. In the U.S.A, 27% of the population are under the age of 18 years, and an estimated 10% of this group are in need of mental health care (1). In Addis Ababa, currently, 31.70% (i.e.771,165) of the population are under the age of 15 years (2) and so far no such estimation of those who are in need of mental health care is available.

A child is not a small adult, and the needs of children differ form those of adults. Physiologic, psychological, and cognitive growth is accompanied by new vulnerabilities to biologic, psychological, and social stresses (1). In addition to these stresses, child abuses, school problems, physical and mental illnesses, and various psychodynamic and family factors keep children under constant stress. Children and adolescents who are unable to cope with these stressful moments and periods of development may not seek or even know that help is available or needed. Thus, it is important for professionals and other adults to identify signs of emotional problems in children as early as possible and refer them for treatment; otherwise the consequences will be quite grave.

Depressed hospitalized children often express suicidal thoughts either consciously (verbally) or unconsciously (on projective testing). Suicidal behavior in children under 12 is extremely rare, but after 12 it is more common and in fact suicide is one of the major causes of death in adolescents (i.e. 12-20 year olds). Suicidal gestures (superficial attempts) are made more frequently by girls than by boys, whereas true suicide attempts are made more frequently by boys(3).

Although the majority of suicidal adolescents are depressed, only about 25% of them meet the DSMIII diagnostic criteria for Depressive Illness while the rest have masked depression. Behavioral

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changes also precede suicidal attempts and self-poisonings in adolescents and these too do not manifest characteristic depressive symptoms (3,4).

Some authors believe that there is under-reporting of childhood suicide and it was asserted that death by suicide in childhood is often reported as accidental to avoid the stigma attached to suicide. However, Shaffer believed that this under-reporting may be true in North America, but he cited good evidences that this is not the case in England and Wales (5).

In his study in England and Wales in 1974, Shaffer found an annual suicide of 1 child out of every 800,000 (i.e. 0.125 per 100,000) in the 10 to 14 year age range(5). McClure, reviewing the same phenomenon, has reported that the total number of children committing suicide in this age group (i.e.10 to 14) is little changed between 1941 to 1980(6) and between 1960 and 1990(7). However, he has indicated that the rate for males has declined and that of females has increased between 1941 and 1980(6). In 1978, in the U.S.A., Shaffer found an annual suicide of one child in 123,000 (i.e.0.8 per 100,0000), again in the age range of 10 to 14. Boys to girls ratio was more than 3:1(5).

The rate (per million) of 'undetermined' death for 10 to 14 year old males increased from 0.6 in 1970 to 9.1 in 1990. For females aged 10 to 14 years, the increase was only from 0.6 in 1970 to 3.4 in 1990. The rate (per million) of 'accidental' death for 10 to 14 year-old males decreased from 36 in 1970 to 9.1 in 1990, but for females the rate remained unchanged (i.e.,4.1 per million). The summation of 'undetermined' and 'accidental' death rates shows a decrease for males and a small increase for females between 1970 and 1990. These two categories of death may contain misclassified suicides which can distort the recorded suicide statistics (i.e., obscure or accentuate actual changes) (7).

In England and Wales, statistics obtained from the Office of Population Census and Surveys and Registrar General's Statistical Review did not show any recorded suicides in children under 10 years between 1950 and 1980(6)and also between 1960 and 1990(7).

The incidence of parasuicide is by far higher than that of completed suicide. But it is also much more difficult to estimate it accurately. What is clear is that the sex ratio is reversed (5). Shaffer has indicated that 7-10% of referrals to child psychiatric services were due to threatened or attempted suicide and some studies gave the incidence of 10-33% in children aged 6-12 years (8). Black et al (1982) stated that 6-8% of parasuicide occurs in the under-12 age group with the rate of admission rising sharply from the age of 12, with peaks at 16 years for females and 18 for males (8). In a 10 to 20 year follow–up, Otto (1972) found that 10% of male and 2.9% of female parasuicides have eventually committed suicide. According to Hawton, short- term prognosis for most parasuicides is relatively good, but 10-14% make a further attempt within a year (8).

'Accidental poisoning' (AP) among urban children under-five was studied thoroughly for five years (1977-1981) in Brisbane (Australia) by Pearn et al. They found that the current age correlated rate of AP was 392 per 100,000 per year and they came across only one fatality during the five year period. This was described as a dramatic reduction in rate compared to the previous 15 years (i.e. 1962-1976) when 13 children died form AP and two were murdered with drug. The reason for this dramatic reduction was found to be due to changes in patterns of drug prescription, safe package of drugs, and coloring blue of certain substances like kerosene, etc. (9).

In Ethiopia, recently, there was a growing awareness and concern about physical illness in children, but no similar awareness and concern about their emotional problems and about the family and psychodynamic factors associated with these problems. Parasuicide and 'accidental poisoning' are reported monthly by the two pediatrics hospitals and general hospitals (government civilian) in Addis Ababa, but none have clearer guidelines for assessment, appropriate management, and possible modes of prevention. Clearly, there are many areas of future research in these three related phenomena, but first, the magnitudes of these problems have to be known.

In paper I (10) the author has tried to show the trends of suicide, parasuicide and AP in the general population in Addis Ababa during, 1981/82-1995/96 with special emphasis on those aged 15 years and above.

The main objectives of this paper are to find out the magnitudes (rates) of suicide, parasuicide and AP in Addis Ababa from 1981/82 to 1995/96 in both sexes aged below 15 years. The trends and seasonal variations of the magnitudes of these phenomena will be commented upon.

Methods

For the collection of data on demography, suicide, parasuicide, and AP and for the statistical analyses refer back to the methods of paper (10).

Results

In part I (10), it was already mentioned that, at Minilik II Hospital, the data collector on suicide did not come across any victim who is below the age of 15 years.

As shown in Table 1, death due to AP among children below the age of 15 years, was recorded both in the Ethio-Swedish and in the Yekatit 12 pediatrics Hospitals, but not in other hospitals. Out of 939 victims registered as cases of 'accidental poisoning', only 12 (1.28%) died in the two pediatrics hospitals during the 15 years period. The kind of poison ingested by the victims is not mentioned
on any of the monthly inpatient morbidity and mortality reports. Also, the author did not come across any death registered as 'undetermined' whether accidentally or deliberately inflicted.

The reported number of parasuicide cases and age and sex specific parasuicide rates for the under15 year olds for the specified 15 years are as follows. The total number of parasuicide cases reported in the two age groups is 479. Out of these, only 122(25.5%) were seen in the two pediatrics hospitals. The remaining 357(74.5%) were seen in general

Table1: **Age distribution of deaths due to 'accidental poisoning' in two pediatrics and other hospitals in Addis Ababa during 1981/82-1995/96, Ethiopia .**

Hospitals	Age			
	Under 1Yr	1-4yrs	5-14yrs	Total
Yekatit 12	0	1	7	8
Ethio-swedish	0	1	3	4
All other hospitals	0	0	0	0
Total	0	2	10	12

*Sex of the victims is not recorded in the monthly inpatient mortality reports.

hospitals (government civilian) and are in the age group of, 0-4 nearly 75% of whom are males. Those in the age group of 5-14 are 402(83.9%) of whom 55.5% are males.

In the age group of 0-4, the reported yearly parasuicide rates (per 100,000) ranged from 0.00 to 29.36 for boys, the average being 3.75 and from 0.00 to 12.25 for girls, the average being 1.49. Zero annual rate was the dominant rate in both sexes during the

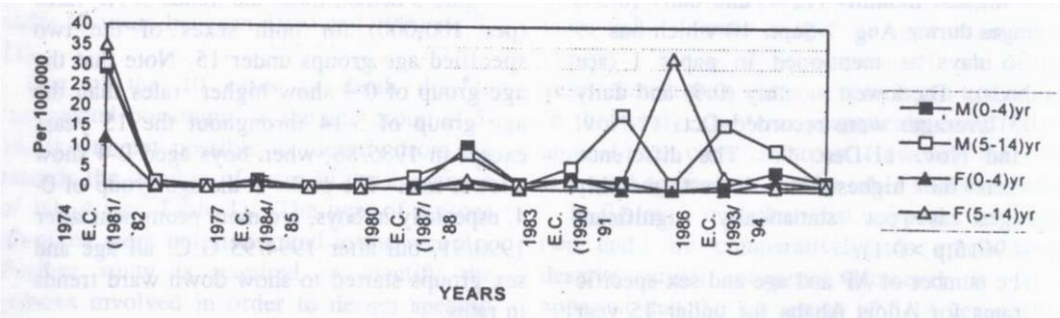

Figure 1: **Reported parasuicide rates (per 100,000) of specified ag e sgroups, under-15, of both sexes, in Addis Ababa, 1981/'82-1995'96 G.C., Addis Ababa, 1998.**

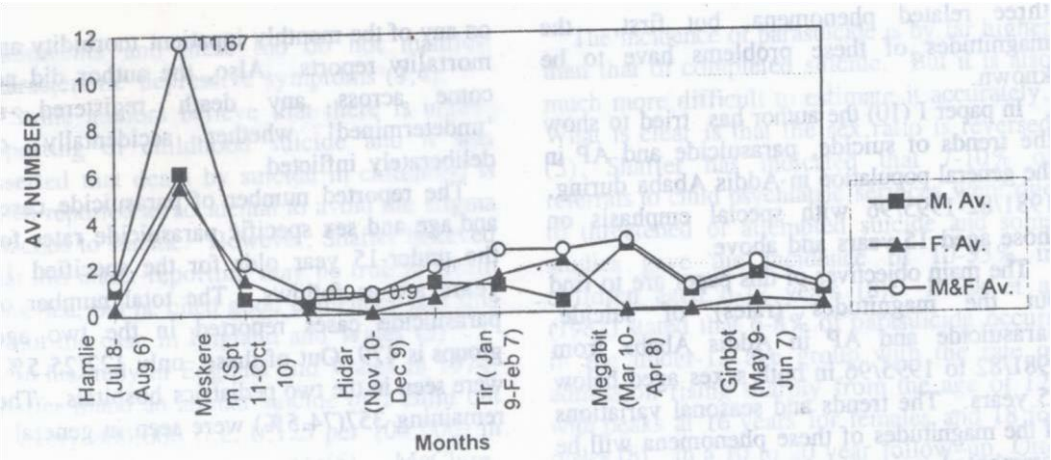

Figure 2: **Monthly average of reported parasuicide cases for the Addis Ababa population, under 15 years, from 1974 to 1988 E.C. (i.e. 1981/82-1995/'96 G.C.), Addis Ababa, 1998.**

specified 15 years. In the age group of 5-14, the reported yearly parasuicide rate (per100,000) ranged from 0.47 to 30.18 for boys, the average being 6.74, and from 0.00 to 35.02 for girls, the average being 5.39.

Figure 1 demonstrates the trends of the reported parasuicide rates (per 100.000) for the two specified age groups below 15 years. Note that all age groups of both sexes had their peaks in 1981/82, followed by sudden drops in rates the next year and in the subsequent years. This was then followed by the appearance of small peaks after 1990/91 in the age group of 5-14 of both sexes. But in the age group of 0-4 the rate of the reported parasuicide remained very low.

Figure 2 demonstrates the trends of monthly average of the reported parasuicide cases, during the specified 15 years, in under-15 Year olds. Males and females combined had their highest monthly (11.7) and daily (0.33) averages during Aug. 7-Sept. 10 which has 35 or 36 days as mentioned in paper I (see methods). The lowest monthly (0.9) and daily (0.03) averages were recorded Oct. 11Nov. 10 and Nov. 11-Dec. 9. The difference between the highest and lowest monthly averages is not statistically significant ($t=0.9615, p>0.1$).

The number of AP and age and sex-specific AP rates for Addis Ababa for under 15 year olds during the specified 15 years are as follows. The total number for both age and sex groups amounted to 939 cases. Out of this, 929(98.9%) were seen in the two paediatrics hospitals, Yekatit 12 and Ethio-Swedish. The remaining 10(1.1%) were seen in the general hospitals mentioned earlier (see 'Method' section of part 1). Out of 939, 533(56.8%) were in the age group of 0-4 and about 60% of them were boys. Those in the age group of 5-14 were to 406(43.2%) and 67% of them were boys. In the age group of 0-4, the yearly AP rate (per 100,000) ranged from 4.83 to 45.42 for boys and

from 1.00 to 25.21 for girls, the average rate being 19.91 and 12.60 for boys and girls, respectively. In the age group of 5-14, the yearly AP rate (per 100,000) ranged from 1.84 to 16.94 for boys and from 0.47 to 9.38 for girls, the average rate being 8.05 and 3.96 for boys and girls, respectively.

Figure 3 demonstrates the trends of AP rates (per 100,000) for both sexes of the two specified age groups under 15. Note that the age group of 0-4 show higher rates than the age group of 5-14 throughout the 15 years except in 1985/86, when boys aged 0-4 show a lower rate. The peaks in the age group of 0-4, especially in boys, are more prominent after 1990/91, but after 1994/95 G.C. all age and sex groups started to show down ward trends in rates.

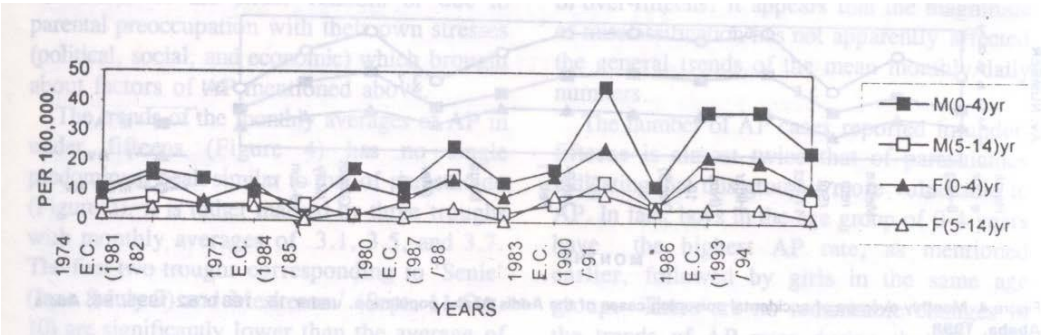

Figure 3: **Accidental poisoning rates (per 100.000) of under- 15, of both sexes, in Addis Ababa, 1981/'82-1995/'96, G.C, Addis Ababa1998.**

Figure 4 demonstrates the trends of the monthly averages of AP during the specified 15 years among those aged under 15 years. It reaches the highest peak (6.7) in 'Tikimt' (Oct. 11-Nov.10) which is significantly higher ($t=2.4490, p<0.050$) than that of 'Senie' (June 8-July 7) (3.1). It was also singificantly higher ($t=2.2094, P<0.05$)than that of 'Meskerem' (Sept.11-Oct.10) (3.5).

Discussion

There were no recorded suicides in children under 15 at Minilik II Hospital in Addis Ababa during the specified 15 years period. The reported 'accidental' deaths in the two pediatrics hospiatls, though small in number, have to be examined carefully as it may contain misclassified suicides, especially in those aged 10-14 years. Suicide in the age group of 10-14 is known to occur in western countries like England and Wales, but there have been no recorded suicides in children under 10 years between 1950 and 1990 (6, 7, 11).

Out of the 10 cases of death due to 'accidental poisoning' in the age group of 5-14, it was not possible to identify from the records the number of cases in the age group of 10-14 (see Table 1). The type of poisons involved were not also found in the records. Further study is required to identify the poisons involved in order to design specific preventive measures.

Coming back to the reported parasuicides in children, the author is of the opinion that the figures are misclassified. It was mentioned earlier that in the age group of 0-4 years, 77 cases of parasuicide were reported during the specified 15 years and that the average annual rate(per 100,000) was found to be 3.75 and 1.49 for boys and girls, respectively. These figures are not acceptable as children of this age lack conceptual maturity to apply suicidal or parasuicidal acts to solve their psychodynamic or family problems. Mistakes in classification may arise when there are difficulties in distinguishing 'accidental poisoning', 'suicidal behaviors', and ' a form of child abuse'. Sometimes mistakes may be comitted when the responsible pediatrician fails to fill in the diagnostic number and this duty is left to other health workers. The reported 402 cases of parasuicide in the age group of 5-14 years and rates (per 100,000) of 6.74 (for boys) and 5.39(for girls) also have to be taken cautiously. To the younger cases, especially to those under 10 years of age, the same analogy applies. But to those

between 10 and 14 years, though their exact number is not known in this study, the term parasuicide could be applied as in other countries. However, there is a need to confirm this by other studies.

In figure 1 it is clear that the peaks at the two ends are comparatively too small to deserve similar comments. However, it is apparent that the age group of 5-14 years is mostly responsible for these peaks. The reason for not accepting the diagnosis of

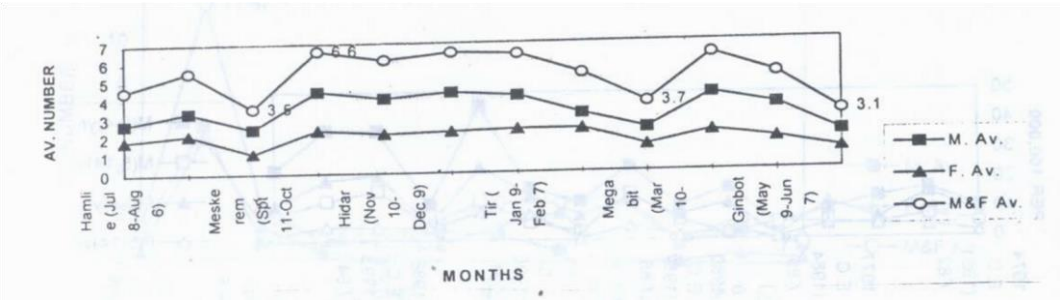

Figure 4: **Monthly average of accidental poisoning cases of the Addis Ababa population, under 15, 1981/'82-1995/'96, Addis Ababa, 1998.**

parasuicide in children under 10 was already mentioned.

Examining the monthly variation of the average number of parasuicides in under-15 year olds (Figure 2), the trends are similar to that of over-15 year olds. Figure 4 shows monthly trends of the same phenomena in over 15 year olds. Both age groups have their highest monthly and daily average numbers of parasuicides in 'Nehasie' (Aug.7-Sept.10). Out of 479 reported cases of parasuicides during the specified 15 years in under-15 year olds, 175(36.5%) were seen in the month of 'Nehasie'. In over-15 year olds, out of 14102 cases of parasuicides reported during 15 years, 2058 (14.6%) were seen in the month of 'Nehasie' (10). These findings emphasize the need for a careful investigation of possible association of parasuicide with factors peculiar to the month of 'Nehasie'. Such factors were already discussed (10).

Now, comparing figures of AP's with those of parasuicides among children under 15. More cases of AP(939) were reported than parasuicides (479) during the specified 15 years. On the other hand, in the age group of 15 years and above, more parasuicide cases (14102) were reported than AP (3014) during the same period (10). This shows the relative importance of the two phenomena in under- fifteens and in over-fifteens.

In under-fifteens, the younger age group of 0-4, both in males and females, have higher rates of AP than the older age group (ie. 5-14). Infact, males aged (0-4) have the highest average AP rate (19.91 per 100,000) of all age groups of both sexes and females in the same age group have the second highest rate(12.60 per 100,000). This indicates that children of both sexes in the age group of 0-4 are in general highly vulnerable to AP.

It is known that accidents involving household poisons, especially in children under five years of age, are attributable to three main factors: (1)improper storage, (2) poor lighting, and (3) human factors, including failure to return poison to its proper place, failure to read the lable properly, and failure to recognize the substance as poisonous (12). In the U.S.A., non-fatal poisnings are 100-200 times as frequent as fatal poisonings. Medicines account for about 50% of all cases of poisoning (aspirin 20%); cleaning and poisoning products, 17%; pesticides, 10%; and petroleum products, 10% (12).

Eventhough it is not known what types of household poisons are responsible in Addis Ababa, general instructions on how to prevent household poisoning are best given to parents repeatedly and regularly with each visit to the M.C.H. clinic and booklets should be available for distribution.

If there is an older child in the family, the parents may be warned that it is common for an older child to feed a younger one a poisonous material (12).

The visible increase rates of AP after 1990/91 (see Figure 3), specially in the age group 0-4 could be due to easy availability of household poisons in the market, including in the hands of the street vendors or due to parental preoccupation with their own stresses (political, social, and economic) which brought about factors of AP mentioned above.

The trends of the monthly averages of AP in under fifteens (Figure 4) has no single predominant peak similar to that of parasuicide (Figure 2). It is rather marked by three troughs with monthly averages of 3.1, 3.5, and 3.7. The first two troughs corresponding to 'Senie' (June 8-July 7) and Meskerem' (Sept. 11-Oct. 10) are significantly lower than the average of 'Tikimt' (Oct. 11 - Nov. 10)which has the highest monthly average (6.67). The reason for this, whether it depends on the seasonal availability of house-hold poisons or parental and other factors, needs further investigation.

In conclusion, this retrospective study of 15 years data on suicide, parasuicide and AP has its own short-comings. 1. Some of the recordings of data, especially on suicide, are incomplete. 2. The age groups used in the report forms of the Ministry of Health are not suitable for tabulating suicidal behaviors; for example, using age groups of 5-14 for suicide and parasuicide which are not reported below the age of 10 years is quite unacceptable. 3. Possible lack of proper knowledge of case definitions and carelessness in tabulation, which lead to the wrong diagnosis and mis-classification. With these limitations in mind, it could be concluded, from the data collected from Minilik II Hospital, and the two pediatrics and other hospitals mentioned, that suicide for under-15 years was not reported so far in Addis Ababa even though 10 deaths were reported due to AP during 15 years in the age groups of 5-14 years.

Seventy seven reported cases of parasuicide in the age group of 0-4 years have to be considered as misclassifications. Similar mis classifications are also believed to exist among some of the 402 reported cases of parasuicide in the age group of 5-14 years showing relatively small peaks at the two ends of the graph as in over-fifteens. The mean monthly/daily number of parasuicide also has a single remarkable peak for the month of 'Nehasie' (Aug. 7 - Sept. 10), similar to that of over-fifteens. It appears that the magnitude of misclassification has not apparently affected the general trends of the mean monthly/daily numbers.

The number of AP cases reported in under- fifteens is almost twice that of parasuicides indicating that this group is more vulnerable to AP. In fact, boys in the age group of 0-4 years have the highest AP rate, as mentioned earlier, followed by girls in the same age group. There are no remarkable changes in the trends of AP rates during the 15 years indicating that factors which had some effect on parasuicide rates did not show any effect on AP rates. But the trends of mean monthly number of AP have manifested three troughs, two of which are significantly lower than that of the month of 'Tikimt' (Oct. 11 - Nov. 9) which has the highest mean. The real reason for this needs further investigation .

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