FAMILY FACTORS INFLUENCING INTENTIONAL SELF-ORGANOPHOSPHATE POISONING AMONG PERSONS OF AGE 15-30 YEARS IN KERICHO COUNTY, KENYA.

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ABSTRACT

Aim; The aim of this study was to explore factors that influence intentional self-poisoning among patients aged 15-30 years in Kericho County. The study's specific goals were to explorethe influence of family factors, on intentional self-organophosphate poisoning.
Study design. The study adopted cross-sectional study design
Place and duration of study: Study was conducted in Kericho County, health facilities for a period of 4 months..

Methodology:100 respondents were included in the study(88 males and 12 females).

Sample size of 100 respondents was used which was estimated population of patients who might have been affected with poisoning during study period. Data was collected from respondents who were attended and recovered during the study period of four months.

Data analysis. The collected quantitative data was analyzed using Statistical Package for Social Sciences (SPSS) version 21. Correlation and regression analysis were carried out to establish relationship between variables. Chi-square also was used to measure correlations of variables. The analyzed data were presented in tables, charts and the corresponding thematic areas. Statistical significance was set at $p<0.05$.
Result; The results indicated that family factors showed positive influenced on self-poisoning.had correlation of 13.319 where significance was set at p=0.0001 indicating a high likelihood of influencing one to self-poison.
Conclusion;This study suggested counselors to have a prediction model to classify patients at a higher risk of self-harm by use of poisons and to focus on individual preventive strategies. Patients in the high-risk group require referral for mental health assessment and counseling both individual and family to alleviate helplessness and hopelessness, healthy lifestyle like come together party, and restriction of access to poison .This will eventually reduce these cases of self-poisoning in our Counties and Country at large.

Keywords:Self-poisonin,organophosphate,intentional.

*Acronym; **IPM**-Integrated Pest Management,*
***DSP**; DeliberateSelf-Harmed**,IVM**;Integrated Vector Mangement*
***OP**; Organophosphate Poisoning.*

BACKGROUND.

Organophosphorus (OP) attempted suicide or insecticide self-poisoning is the major significant global form of acute poisoning killing almost 100,00 people and affecting more than one million every year (1). In addition, in developing countries persons dying from pesticide self-poisoning are more than 168,000 every year (1).

The period of development between 12 years and 15 years is vital to directly conduct a research on self-harm since these years consists of the (12-14years), peak(15-24years) and beginning of remittance of the behavior (2).Furthermore, due to unintentional poisoning, approximately 4.8 million years lose their lives. This proportion is significant because of pesticides (3). According to the 2017 World Health Organization (WHO) report, it was found to be the most cause of early deaths among adolescents. Moreover, findings from the USA and the UK in three different studies reiterates that self-poisoning rates among adolescents and children has been on the rise from the commencement of this decade(4,5,6).

The high rise of admission of children and adolescent in the emergency departments as a result of self-harm or self-poisoning have been reported in the New South Wales according to the two recent studies from Australia. from 2010 to 2014 (7,8).Poisoning by organophosphorus compounds is a worldwide challenge in the health sector. According to WHO, the most common poisoning cause is pesticides; approximately 3 million cases of pesticide-poisoning every year global occurrence initiating over 220,000deaths. (9). For those attempting suicide, the emergency department severally acts as the sole point or primary contact in the sector of healthcare and caused by the nature of situation's urgency.

Since 2008, the trend of people presented in emergency care units in hospitals is increasing. It is estimated that about 200,000 people are presented in hospitals every year as a result of self-poisoning or self-harm (10). Suicidal attempts in Iran is approximately 91.65 per 100,000 people commonly reported in people between age 15-24 (11).There is need for registrars and regulators for pesticide to improve their role in ensuring food security among people as well as achieving pest control. Over the last 70 years, it is anticipated that food security in the world would have been better if there was no establishment of pesticides; this would as well have reduced the high incidences of vector-borne disease. On contrary, all pesticides are manufactured with toxins that are harmful to living organism and they do not select what type of a living organism to affect. The IPM and IVM are the recognized alternatives to intensive pesticide use as promoted by the FAO and the World Health Organization (12). Furthermore, the report indicated a 151% increase in suicide rates among females between the age of 10-15 years; this translates to a total of 81% attempted suicide rates.(13).The sample data extracted from the National Emergency Department in period between 2006 and 2013 showed a high rate of frequency from visits among people between the age of 15 and 19 years. This frequency was as well discovered to translate close to two times of the visits made by people between the age of 35 and 50 years. The suicide mechanism with the highest prevalence index was poisoning with 66.5% (14). In India, a research conducted by (15) found that OP pesticides self-poisoning was the highest mechanism of suicide in rural areas as a result of to the lack of regulatory control over the same and the ease of availability of these compounds. Suicide attempts is a vital factor in determining the future rate of suicidal deaths as well as suicidal survivors; the survivors should undergo a psychiatric care as it has lower probability of subsequent (16).

Age, gender, race, psychosocial variables, employment, education, family status, and accessibility to mental health resources are a few socio-demographic characteristics that increase the risk of suicide. However, family strife was the primary factor in DSP (43.17%) Where early parental separation are all associated with self-harm The causes of DSP and demographic data clearly differed from one another. Gender, age groups, marital status, employment position, and educational status are typical (17).

The level and distribution of each chemical found in the blood or urine, as well as the approximate time since death, are all mentioned in toxicology reports. This data is used by the pathologist to establish whether the substances contributed to the death or were just present at the time of the death. Such conclusions are difficult to make since they may be impacted by the deceased's medical history as well as chemical concentrations that rely on when bodily fluid samples were taken. Instead of drawing our own conclusions from an analysis of the raw toxicology data, we solely relied on the pathologists' assessments of the presence and/or toxicity of specific substances in each case. We disclosed the existence of all substances and if the pathologist determined that they were the cause of death (i.e., at toxicity levels). These included poisons, alcohol, and illegal substances (18.

Pesticide-poisoning is possible when there are societal and family conflicts related to changes in cultural gender roles and family leadership. Interpersonal conflicts may act as triggers of self- harm. Sometimes it is difficult to overcome emotional distress, intention to self -harm or to escape unresolved distress, leading to self- harm (19) .

Marital and non-marital challenges ended up disputes, unexpected conceptions, and intimate lack of affections funding problems. Companion failures, parting ways and legal dispute settlement cases pertaining children care .On rejection of marriage companion may shake family bond.(20).The study of 10 years conducted in South India confirmed record of suicide by poisoning by applications of agrarian and manufacturing substances

mainly the one which can be misused for self-harm and to established issues influencing self-harm for instance family conflict yields 30.2%,chronic diseases have 28.2%,funding constraints was11% psychological issues was 9.7%.(21.
According to study conducted by Albano found out that there is a relationship among those who have adequate social and economic support as compared with those from poor social economic background where they are likely to experience loneliness and hopelessness.
Psychological disruptions may be influence by unfavorable environmental conditions and poor social wellbeing which may increase risk of self-harm. Low self -esteem, lack of employment poor academic background could worsen the suicidal ideations. (21).
During early schooling, mitigation measures for the young ones should be put in place so that these young individual would be in a position to withstand any family and cousins disputes arising in order to handle day to day challenges. Peer group management is very crucial in order to empower them to relate to each other well and this will be part of preventive measures for this age set. Parents also must have play a very important activity in selecting as well as approving their associates with good characters in order to enable their children to emulate the same in their life. Shokrzadeh study is in agreement with other related research conducted in Iranian country which look like lack of employment, parental disputes and mood disorders.(17).
A research delegation of multidisciplinary members allocated to look into every attempted self-harm case where Socio-demographic data were captured and inquiry into triggering factors for the self-harm touching on finance, peer pressure and dispute within the family set. (22).
Two thousand seven hundred and twenty four respondents were interviewed within a span of one year (from 2019 to 2020) for the deliberate suicidal intention among young women below Twenty five years among them are in training institutions, including the following factors: residence(urbanites-62.7percent),family problems(58.2 percent) and psychological issues(37.3 percent) posing high mortality rate following self-harm by ingestion of poisons as compared with other possible means of self-harm where it was found to be 95% (intentional self-poisoning from which pesticide self –harm was 39%).Financial problems and psychological issues are the major contributing factors to the self- ingestion of poisons.(22)
.Kasemy et al study assessed factors contributing to intentional self-ingestion of poisons and concluded that domestic issues take the lead followed by psychosocial problems. The study's results were in agreement with other studies done before of which their conclusions were as follows: domestics conflict and psychological issues contributed to self-harm where mood swings and mitigations measures must be considered. There is a relationship between psychological issues and intentional self-harm. The level of depressive disorders within the society, worsened by community challenges like lack of employment, domestic problems, family collapse and non-academic performers commonly in low social economic communities. (22).About 87.1% of the suicide was as a result of psychosocial factor, particularly interpersonal conflicts which translated up to 72.1%.
Family conflict such as spouse disagreement was also a factor that led to impulsive attempts of suicide. The attempts among women could be temporarily related with emotional distress, especially after arguing with their spouses regarding unfaithfulness issues, domestic violence or alcohol use. These arguments are likely to trigger self-harm among women. Psychosocial factors were most reported by adolescent women. Men who are married mostly have conflicts with their wives on alcoholic influence and they can also be at risks of conducting suicide. (23).
Other studies have also indicated that high level of family conflicts during middle school level of adolescents have as well elevated symptoms of depression among adolescents (24).
The level of parent-child conflict differs among various cultures. (25).In addition, in history of young suicide cases due to high rate of violence at home are prevalent in dealing with family issues as well as issues affecting children from the respective families. There is no much evidence of high rate of suicide among young children as a result of parental divorce; however, there are cases of suicide which are divorce-related (26).

It is important to explore suicide risk factors so as to direct preventive and management strategies. Recently, a number of variables haven been identified to be important to suicide ideations or attempts, such as gender , family integrity , feeling helplessness , depression, self-esteem , hopelessness , stressful life events, .(27).Apart from family conflicts, other factors for example, school-based interpersonal relationships among teachers, peers and adolescents as well are significant in adolescent depression. Concerning the effects of relationship between a teacher and a student, a study revealed that strong support from the teacher helps to reduce the risk of suicide among Japanese adolescents (28).

In another study in China also revealed that teacher-support in the 7th grade helped to reduce the rate of anxiety and depression among learners in the 8th grade (29).
There is minimal or no evidence on the presence of poor conflicting relationship between the teacher and the student relating to symptoms of depression among children. This is because most studies focus on researching on the relationship between children's depression, and the presence of supportive relationships between the teacher and students. Conflictual relationships between the teacher and the student may be related to other issues concerning the health of the mind.
For instance, conflictual teacher-student relationship in the elementary learners could be noticed from the aggressive trait of such a learner in the 5th grade (30). A similar study revealed that teacher-student conflict was subsequent external behavior and associated children's concurrent (31).In China, poor relationships between the student and the teacher may impose depressive symptoms in the adolescents given that there is need to further explore whether conflictual. In another study conducted in Britain among adolescents revealed that peer victimization results into subsequent and concurrent symptoms of depression among young children in relation to the peer-relationships influence (32).The relationship between depressive symptoms and peer victimization affects adolescents in Korea(33).

Statement of the Problem

The vulnerability of adolescents, a group susceptible to self-harm, adds to the urgency of addressing this issue. Despite this, there exists a lack of comprehensive exploration of factors contributing to the rising incidence of intentional self-poisoning cases, particularly among youths aged 15 to 30 years. Notably, the hospitals within Kapkatet sub-county, Londiani sub-county, Kericho county referral, and Sigowet sub-county face a monthly average of 29 self-poisoning cases, with a concerning trend of defaulting follow-up patients. These cases impose a strain on both families and healthcare resources. This study recognizes the need to explore factors driving this disturbing trend, potentially including family conflicts, Consequently, it is imperative to conduct a comprehensive community-based study to identify these factors, propose mitigation strategies, and establish frameworks to effectively address and prevent future occurrences, safeguarding the well-being of these vulnerable individuals and alleviating the burden on healthcare facilities and families.

Purpose of the study

The study aimed at exploringfamily factorsinfluencing intentional organophosphate self- poisoning among persons aged between 15-30 years in Kericho County, Kenya and establishing measures to curb the predicament.

Material and methods .

Location of the study

This research was conducted in Kericho County. Kericho county is one of the 47 counties in Kenya. This county is about 256 kilometers from Nairobi. Kericho County is known for its large- and small-scale tea-farming and most of its residents rear livestock as well and that was a major reason for selecting this County for the study due to availability of the said chemicals for agricultural use. This study focused on organophosphate because of the cases being treated in the County representing 75% of all attempted suicide versus other methods for instance,hanging,stabbing and drowning.

Research design

The study employed a cross-sectional survey. It was a prospectively enrolled exploratory and correlation study of all cases of intentional organophosphate self- poisoning and relied majorly on the diagnosis made by clinicians at emergency departments. It was based on presenting symptoms and history from the respondents and outcomes of laboratory investigations of respondents of ages between 15-30 years. This was justified by previous studies which showed that this age group was majorly involved in self-poisoning and also encounters teenage and youth life changes with accompanying challenges. This design provided insight into factors that influence youth and teenagers in Kerichocounty, leading to organophosphate self-poisoning. The design was

appropriate for the study since the researcher was able to collect information without manipulation of variables. Family factors considered by the researcher were: irresponsibility/emotional detachment,, violence/emotional insecurity, separation/divorce/or death of bread-winner in the family.

Sample population

All respondents brought to hospital presenting to emergency department with a history of intentional organophosphate self- poisoning were recruited for the study depending on their eligibility. The aim was to sample 100 participants during the study period.

Eligibility

Inclusion criteria

All the study participants passed the following inclusion criteria:
1. Must have presented himself/herself to Kericho county referral hospital or sub-county hospitals at Sigowet, Londiani sub-count hospital and Kapkatet for medical care occasioned by intentional self-ingestion of organophosphate poisons.

2. Were aged between 15 and 30 years. For, minors, either the guardian (close relative) or parent was interviewed.

3. Must have consented to the study and if a minor, the informant must have consented.

Exclusion criteria:

1. Respondents who met the inclusion criteria but were not mentally stable.
2. Respondents who were disoriented/comatose/dead were excluded despite meeting the criteria.
3. The respondents who had not recovered at the end of the study period.

Sample size determination

The study employed Fischer formula to estimate the sample size (mugenda & mugenda, 1999).

$$n = \frac{Z^2 Pq}{d^2}$$

In this formula, n represented the desired sample size when the study population is over 10 000 and z is the standard normal deviate normally set at 1.96 and corresponds to 95% confidence interval (ci). On the other hand, p was the proportion of target population estimated to have the desired characteristic and was 0.07% (q=1-p=1-0.07=0.93), while d is the degree of accuracy usually set as 0.05. The prevalence of intentional organophosphate poisoning in rift valley-regional was 0.07 %. Hence the desired sample size (n) was determined as follows;

$$n = \frac{Z^2 Pq}{d^2}$$

$$n = \frac{1.96^2 \times 0.07 \times (1 - 0.07)}{0.05^2} = 100$$

Reliability testing

The data collection procedure in this study was reliable. This generated reliable results and answered the research questions. The results are reproducible; any researcher who follows the same data collection procedure and data analysis is expected to yield similar results to those of the researcher in this study.

HYPOTHESIS

Ha: Family factors influenceintentional self-poisoning among persons age 15-30 years.
H0: Family factors do not influence intentional self-poisoning among persons age 15-30 years.

Data analysis

The collected data were sorted and coded. Microsoft excel was used. Statistical package for social sciences (SPSS) version 21.0 was used to carry out data analysis. Descriptive statistics such as frequencies, means and percentages were obtained for socio-demographic variables, family factors of the persons aged 15-30 years. Cross-tabulation was carried out to show the relationship among the dependent and independent variables of study. This was carried out for a set of independent and dependent variables at a time. For example, a cross-tabulation of Chi square test was obtained to establish the association among the dependent and independent variables in the cross-tabulation tables. Correlation analysis was carried out to establish the association between socio-demographic characteristics and the outcome variables of the study. Additionally, regression analysis was carried out to show the correlation of factors that significantly influenced self-organophosphate poisoning among the studied group. The analyzed quantitative data were presented using tables and charts. . Statistical significance for quantitative data was set at $p<0.05$.

RESULTS .

Descriptive statistics on family issues

Table 1 Family issues

Statement	**Yes**		**No**	
	n	**%**	**n**	**%**
I have experienced separation/divorce/death of a loved one that affected my development	65	65	35	35
I have a problem communicating with my spouse/intimate partner or your parent	73	73	27	27

Firstly, the researcher sought to know whether respondents had experienced separation/divorce/death of their loved one that affected their development. Out of total respondents, 65 (65%) answered in the affirmative while 35 (35%) said no. Secondly, the respondents were asked whether they had had a problem communicating with my spouse/intimate partner or their parents, to which 73 (73%) said yes whereas 27 (27%) said no.

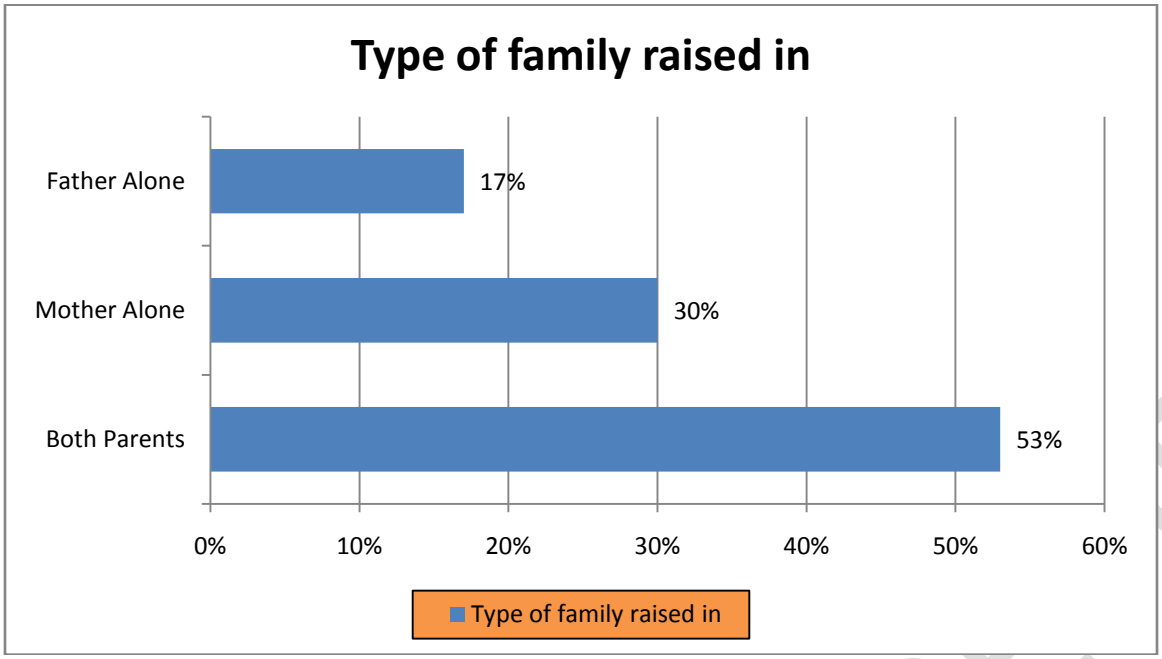

Figure 1 Type of family raised in

Type of family raised in

The question sought to know the type of family the respondents were raised in. Out of the total respondents, 53% said they were raised by both parents. They were followed by those who said they were raised by mothers alone with 30%. However, only 17% said they were raised by fathers alone.

Family history

In this study, the researcher sought to know whether the respondents had had any history that could have predisposed them to attempted suicide.

The following were the responses: economic problems in the family-32%; problem with other siblings -14%; psychological disorders -7%; addiction to alcohol -11%; addiction to narcotic substances - 9%; and marital problems -27%. Their responses are captured in the figure 2 below.

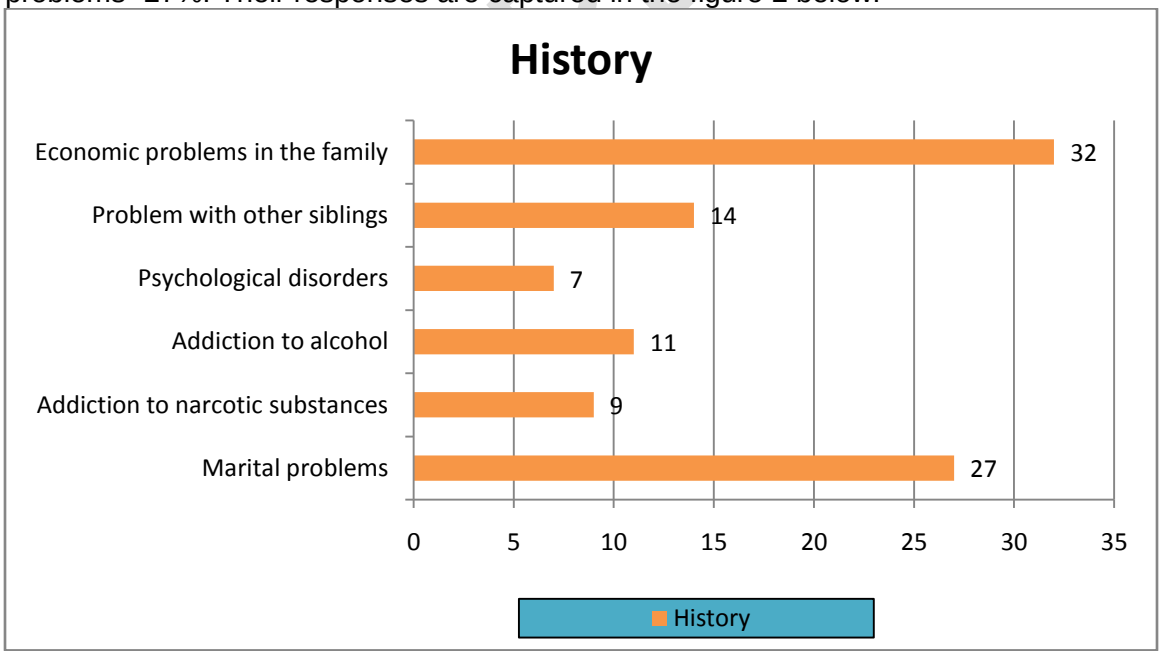

Figure 2: History of the family

Table 2Problem with family member

Statement	Yes		No	
	n	%	N	%
Problem with family member influenced thoughts of committing suicide	56	56	44	44

Secondly, they were asked if problem with family member influenced thoughts of committing suicide and 56% of the respondents said yes whereas 44% said no.

Measure of Association

Table .3 Chi Square measure of association

Variable	Chi-Square Value	Df	*P-Value*
Family Factors	13.319	1	0.001

The study found that there was a statistical relationship between the parameters since the chi square value were 0.001 which was less than the standard p value which is 0.05 at 95% confidence interval.

Non-Parametric Correlation

Bivariate analysis was determined and the results obtained were represented on table below that shows that self-poisoning was correlated to respondents having family challenges.

Table .4: Non-Parametric Correlation

			Self-Poisoning	Family Factors
Spearman's rho	Self-Poisoning	Correlation Coefficient	1.000	
		Sig. (2-tailed)	.	
		N	100	
	Family Factors	Correlation Coefficient	.365**	1.000
		Sig. (2-tailed)	.001	.
		N	100	100

Figure 3.Non-Parametric Correlation

**. Correlation is significant at the 0.01 level (2-tailed).

A strong positive correlation was found between self-poisoning and family factors positively influenced one's propensity to self-poisoning as shown by the results ($p<0.05$, $r=0.372$) and ($p<0.05$, $r=0.365$).

Model Summary
Table 5: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	40.168[a]	.335	.604

The study indicated that the parameters used to determine the model summary fitted the study since the value of Nagelkerke R Square was more than 50% which was 60.4%.

Discussion.

These results concur with the studies of Rajapakse (2015) and Suresh *et al.* (2018).
These indicated that interpersonal conflicts and poor communication among family members contributed to loneliness, hopelessness and helplessness and therefore self-poisoning may have been deemed to be the only option to get rid of the economic and social challenges in the family. Im et al study is in agreement with this study since parental divorce /separation may render their young ones who are entirely depending on both parents helplessness, however, cases of suicide which are divorce-related have been reported in both studies. (Im *et al*., 2017). This study found out that family problem contribute to 32% of the respondents where Kasemy et al,(2022) and Im et al.(2017) concluded in their studies that interpersonal conflicts translated up to 72.1%. Family conflict/marital problems which is more than twice what this study found in this case the two studies have not agreed on the outcome(prevalence) of the studies but agreed on the contributing factors of marital issues. Reasons may be differences geographical locations and farming practices.
Some of the challenges that the were encountered;:

- Unwillingness of respondents to give out information because of confidentiality and cultural beliefs. However, the researcher explained and reassured the respondents that high standard of confidentiality would be observed
- Scheduled questionnaires were time-consuming during administration. However, the researcher ensured that at least 2 respondents were interviewed per day
- Sometimes it was a challenge to establish the specific names of the poisons Therefore, the researcher relied on specific signs and symptoms of organophosphate poisoning.
- It was not possible to interview patients in coma and to obtain information from those who had died. In such cases, the researcher excluded them from the study.
- Confounding factors were as follows;
- Cultural beliefs-Societies have their own ways of sharing resources among familiesmemebers for instance male have more rights in property as compared to females.
- Men in other cultures should be taken through hard times during their early adulthood period to make them tough in the society when they grow up.
- Sidelining of children suspected by one of the parents to have sired out of wed lock in resource sharing.

Conclusion

This study suggested counselors to have a prediction model to classify patients at a higher risk of self-harm by use of poisons and to focus on individual preventive strategies. Patients in the high-risk group require referral for mental health assessment and counseling both individual and family to alleviate helplessness and hopelessness, healthy lifestyle like come together party, and restriction of access to poison .

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Competing interests.

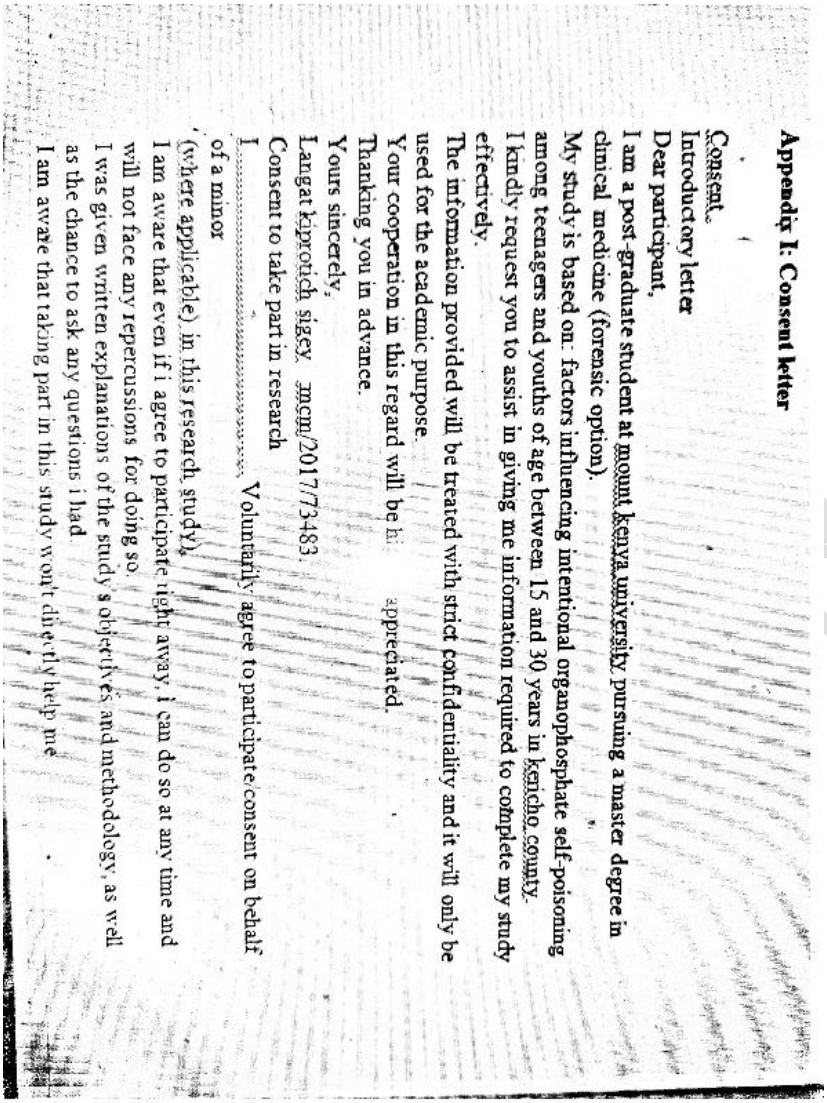
Author has no conflicting interest

Author contributions

This work was carried out by LKS. Author came up with concept paper
Lks collected data, Conducted analysis and Drafted the manuscript eventually revised the manuscript.

CONSENT.

Author declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report. A copy of the written consent is available for review by the editorial office/chief editor/editorial board members of this journal."



Appendix I: Consent letter

Consent.

Introductory letter

Dear participant,

I am a post-graduate student at mount kenya university pursuing a master degree in clinical medicine (forensic option).

My study is based on: factors influencing intentional organophosphate self-poisoning among teenagers and youths of age between 15 and 30 years in kericho county.

I kindly request you to assist in giving me information required to complete my study effectively.

The information provided will be treated with strict confidentiality and it will only be used for the academic purpose.

Your cooperation in this regard will be h appreciated.

Thanking you in advance.

Yours sincerely,

Langat kiprotich sigey mcm/2017/73483.

Consent to take part in research

I ..... Voluntarily agree to participate consent on behalf of a minor

(where applicable) in this research study).

I am aware that even if i agree to participate right away, I can do so at any time and will not face any repercussions for doing so.

I was given written explanations of the study's objectives and methodology, as well as the chance to ask any questions i had.

I am aware that taking part in this study won't directly help me

ETHICAL APPROVAL

The researcher obtained research authorization letter from Mount Kenya University Ethical Review Committee. A research permit was sought from the National Commission for Science, Technology and Innovation (NACOSTI) before conducting the study. Authorizations were sought from the County government, the County Commissioner, the County Director of Education, the management of: Kericho County Referral Hospital, Kapkatet Sub-county hospital, Sigowet Sub-county hospital and Londiani Sub-county Hospital. In addition, the researcher explained the importance of the research to the respondents to obtain free consent and no one was coerced to take part in the study. The participation was voluntary. The researcher assured the respondents that information obtained from them would be treated with utmost confidentiality and their privacy was guaranteed as anonymity would be assured by the use of numbers/codes to identify respondents.

Additionally, the researcher assured respondents that no one would suffer any form of harm in the event of information utilization since the information was particularly for academic purposes and respondents had the freedom to withdraw with no consequences.

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