Patterns of suicide and self-harm in Pakistan: a retrospective descriptive study protocol

Nargis Asad, Shahina Pirani, Summaiya Tariq, Asra Qureshi, Mohammad Zaman, Mustafa Aslam, Farhat Mirza, Murad M Khan

ABSTRACT

Introduction Suicide is a major global public health problem. Low-income and middle-income countries contribute 78% of all suicidal deaths. Pakistan, a South Asian country, lacks official statistics on suicides at national level. Statistics on suicide are neither collected nationally nor published in the annual national morbidity and mortality surveys. Medicolegal reports on suicides and self-harm are extremely rich and important source of information but greatly underused in Pakistan. We aim to examine the patterns of suicides and self-harm retrospectively in patients who were registered with medicolegal centres (MLCs) in Karachi, during the period January 2017 to December 2021.

Methods and analysis Using retrospective descriptive design, the data will be collected from the medical records maintained at the main office of the Karachi police surgeon. Data from all nine MLCs of Karachi are collated and stored at the main office of Police surgeon. Information on suicide and self-harm cases will be extracted from records of all MLCs. The data will be collected using structured proforma and it will be analysed using descriptive and inferential analysis.

Ethics and dissemination The study was approved for exemption from Aga Khan University, Ethical Review Committee. The findings of the study will be disseminated by conducting seminars for healthcare professionals and stakeholders including psychiatrists, psychologists, counsellors, medicolegal officers, police surgeons, mental health nurses, general and public health physicians and policy makers. Findings will be published in local and international peer-reviewed scientific journals.

BACKGROUND

Suicide is a major global public health problem. In 2019, 703,000 suicide deaths occurred worldwide, and it is the second-leading cause of death in young people aged 15–29 years globally. Low-income and middle-income countries contribute 77% of all suicidal deaths. Pakistan, a South Asian, Islamic developing country, lacks official statistics on suicides at national level. Statistics on suicide are neither collected nationally nor published in the annual national morbidity and mortality surveys. The country does not report its mortality data on suicide to the World Health Organization (WHO).

Suicide and self-harm are criminalised acts in Pakistan, religiously condemned and highly stigmatised. Several local-level studies conducted in different parts of the country show that although suicide occurs across the country, these studies lack accuracy and standardisation, and it is difficult to estimate true of the country or even a city.

The WHO estimates there were 19,331 suicidal deaths (females 4,560, males 14,771) in 2019. WHO also estimates that for every suicide there are at least 10–20 acts of self-harm. Hence, there may be an estimated 140,000–300,000 acts of self-harm in Pakistan annually.

Under Pakistani law all unnatural deaths (suicide, homicide and accidents) are deemed as ‘medicolegal’ cases and are required to be investigated by the police. Medicolegal autopsies are performed by authorised medical officers in specially designated ‘medicolegal centres’ (MLCs) to determine cause and manner of death. In Pakistan, all cases of suspected suicides must be taken to MLCs, which are usually located in the main government hospital of the city. Some large cities may have more than one MLC.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The data collection will be done from all medicolegal centres located in different districts of Karachi Pakistan.
⇒ We intend to review all medicolegal cases presented during the study period and will identify and extract medical records for SH and suicide cases; this will reduce the chances of missed cases.
⇒ We will include all confirmed cases of self-harm and suicide even if the information is incomplete in records.
⇒ The limitation of the study will be misclassified or missed data due to illegible handwriting in the registers.
MLCs are staffed by medicolegal officers (MLOs) who are specially trained to deal with all medicolegal cases, including suicides. Only MLCs are legally authorised to handle suicide cases.

In Karachi, there are nine government sector hospitals designated as MLCs. Three of these—Civil Hospital Karachi (CHK), Jinnah Postgraduate Medical Centre (JPMC) and Abbasi Shaheed Hospital (ASH)—are the major MLCs that are functioning round the clock with proper facilities for postmortem and medicolegal examinations and issuance of medicolegal certificates. The vast majority of medicolegal cases are attended at these three major MLCs.

The other six centres are the Sindh Government Hospitals New Karachi, Saudabad, Korangi, Liaqatabad, Lyari General and Organi Town (Table 1). At these centres simple medicolegal examination is carried out and certificates are issued but postmortem examinations are not carried out due to lack of proper facilities and all serious cases are referred to the three major centres.3 4

**Registration and diagnosis of suicide in Pakistan**

Suicide and attempted suicide are considered criminal offences under Pakistani law, punishable with a jail term and/or financial penalty. In Pakistan, despite the fact that a Magistrate has the powers to hold an inquest, this is rarely done and in practical terms it is the police who has powers similar to a Coroner in UK or Medical Examiner in USA.

The police investigate all cases where suicide is suspected and collects circumstantial/eyewitness and crime scene evidence. They also have the authority to request an autopsy. The autopsy is performed by an MLO who gives his opinion on the cause of death and (when requested) may give his/her opinion whether findings are suggestive of suicide (manner of death).

After collecting and reviewing all the evidence, the police give the verdict whether death was due to suicide or otherwise.

There are serious issues of governance at all steps in the registering and reporting pathway that influences the ultimate information available on suicides in Pakistan.

The process of ascertainment of suicides in Pakistan is very weak. The system of ascertainment is not standardised across the country. The diagnosis of suicide is made variously by the police, magistrates, MLO or forensic medical specialists in different settings. Similarly, a forensic autopsy is not conducted in every case of suicide. This decision is influenced by sociocultural and religious practices of the family.

There are several other factors such as: cases not being registered as suicides by the MLCs; cases not being recorded as suicides by police; cases being recorded by local police station but not reported to police head office; cases being recorded as suicides but later changed to either an accident or medical cause due to political and other reasons (religious and social stigma).

All of these have a bearing on arriving at the true counting of suicide numbers. Hence, it is generally believed suicide cases are under-reported and under-counted in Pakistan.

As noted above, there are no official rates of suicide in Pakistan. A proper system of diagnosis, registration and reporting suicide data has never evolved and does not exist in Pakistan. Rates of suicides for various cities of the country are published by researchers or released by police from time to time but because the data source and time periods are very variable it is difficult to carry out any meaningful comparisons.

Against this background, medicolegal reports on suicides are probably the closest to ‘official’ statistics on suicides in Pakistan. In settings such as that of Pakistan, MLC records on suicide are an extremely rich and important source of information but greatly underused. There have been very few studies based on medicolegal reports, despite the fact MLCs are in every city of the country.

**Overview of studies on patterns of suicide and self-harm in Pakistan**

A number of studies on suicides have been carried out based on police and forensic autopsies in Pakistan (refer Table 2). These have provided useful information on patterns of suicide, methods used and other sociodemographic variables.
(eg, age and gender). Similarly, studies of self-harm in Pakistan are listed in Table 3. These are mostly health facility based, with a few based-on police records.

**Significance of the study**

WHO aims to reduce suicide rates by 10% by 2030 and suicide reduction is included in sustainable development goal. However, lack of registering and reporting self-harm and suicide in Pakistan impedes the achievement of these targets. Once an individual has presented with an act of self-harm, their risk of future suicide is raised up to 49 times that of the general population.

In Pakistan, suicidal behaviour remains an understudied and under-researched area. Official mortality statistics on suicide are not available. As a result, intervention studies and suicide prevention efforts have lagged.

Studying the pattern of suicide and self-harm will help us to understand the associated demographic and other risk factors, vulnerable population, peak age, gender, sect, ethnicity, sociocultural background, common methods of suicide and reasons of suicide in Karachi, Pakistan. To develop a suicide prevention strategy, there is a strong need to monitor the demographic patterns and means involved in cases of self-harm and suicide, as this will assist in identifying high-risk individuals.

The findings of the study will assist health professionals in developing primary and secondary suicide prevention strategies as well as informing policy for suicide prevention in Pakistan.

The study will also identify gaps in the process of information gathering and recording in suicide cases. Based on our findings, we hope to generate recommendations for improvement in data collection and recording in suicide cases in Karachi.

This will be the first study in which source of data will be all MLCs located in different districts of Karachi (refer Table 1 for location of MLCs in different districts of Karachi) that will give us a clear picture of suicidal cases from diverse socioeconomic backgrounds and geographical locations. Moreover, the study settings will provide us a representation of the overall population of Karachi, which will enhance the external validity of the study by ensuring the generalisability of the study findings.

**METHODS**

**Study design and setting**

To study the patterns of suicide and self-harm, a retrospective descriptive study will be conducted.

<table>
<thead>
<tr>
<th>Source</th>
<th>Place of study</th>
<th>Duration of the study</th>
<th>Suicide cases</th>
<th>Suicide rate</th>
<th>Male female ratio</th>
<th>Age</th>
<th>Common methods of suicide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Khan and Hyder</td>
<td>Sindh</td>
<td>1985–1999</td>
<td>2568</td>
<td>1.15/100 000</td>
<td>2.5:1</td>
<td>N/A</td>
<td>Organophosphate poisoning</td>
</tr>
<tr>
<td>Ahmed et al</td>
<td>Karachi, Sindh</td>
<td>1995–2001</td>
<td>1379</td>
<td>198.4</td>
<td>1.7:1</td>
<td>21–30 years</td>
<td>Drug poisoning</td>
</tr>
<tr>
<td>Ali et al</td>
<td>Peshawar, KPK</td>
<td>2001</td>
<td>2 out of 89</td>
<td>N/A</td>
<td>100% F</td>
<td>N/A</td>
<td>Firearms, sharp weapons</td>
</tr>
<tr>
<td>Ali et al</td>
<td>Peshawar, KPK</td>
<td>1997–2001</td>
<td>9 out of 52</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Poisoning</td>
</tr>
<tr>
<td>Bashir et al</td>
<td>Peshawar, KPK</td>
<td>1991–2000</td>
<td>39</td>
<td>0.21 per 100 000</td>
<td>2.9:1</td>
<td>20–29 year</td>
<td>Firearms, hanging</td>
</tr>
<tr>
<td>Saeed et al</td>
<td>Faisalabad, Punjab</td>
<td>1998–2001</td>
<td>95</td>
<td>1.12/100 000</td>
<td>2.4:1</td>
<td>20–29 years - M &amp;10–19 years - F.</td>
<td>Hanging</td>
</tr>
<tr>
<td>Sultan</td>
<td>Karachi, Sindh</td>
<td>2001</td>
<td>51 out of 632</td>
<td>N/A</td>
<td>N/A</td>
<td>Median: 29 years</td>
<td>Hanging, drowning, cutthroat</td>
</tr>
<tr>
<td>Rana et al</td>
<td>Lahore, Punjab</td>
<td>1984–1988</td>
<td>21 out of 60</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Poisoning</td>
</tr>
<tr>
<td>Bashir et al</td>
<td>Lahore, Punjab</td>
<td>1994–1999</td>
<td>45 out of 91</td>
<td>N/A</td>
<td>2.46:1</td>
<td>41–50 years - M</td>
<td>Hanging</td>
</tr>
<tr>
<td>Aziz and Awan</td>
<td>Lahore, Punjab</td>
<td>1993–1995</td>
<td>96</td>
<td>0.87 per 100 000</td>
<td>1.43:1</td>
<td>20–30 years</td>
<td>Hanging, firearms, cutthroat</td>
</tr>
<tr>
<td>Malik et al</td>
<td>Lahore, Punjab</td>
<td>1984–1996</td>
<td>2 out of 837</td>
<td>N/A</td>
<td>1:1</td>
<td>N/A</td>
<td>Cutthroat</td>
</tr>
<tr>
<td>Ahmed and Zubert</td>
<td>Karachi, Sindh</td>
<td>1974–1978</td>
<td>25</td>
<td>N/A</td>
<td>1.27:1</td>
<td>11–20 years</td>
<td>Drugs and poisons</td>
</tr>
</tbody>
</table>

F, female; M, male; N/A, not available.
This study will use the medical records maintained at the main office of the Karachi police surgeon. Data from all the nine MLCs of Karachi (Table 1) are collated and stored at the main office of Police surgeon, Karachi. Three major MLC of tertiary care government hospitals in Karachi include CHK, JPMC, and ASH.

Karachi is Pakistan’s largest city and the country’s main commercial and business centre. It has an unofficial estimated population in excess of 20 million7 though the official population is listed as 16 million8 with the annual growth rate of 2.5%.8 The city has three major government hospitals, which are also the designated major MLCs: the CHK is a 1900-bed tertiary care government hospital which caters patients from the entire provinces of Sindh and Baluchistan,9 JPMC has 1650 beds, with an annual patient visit of more than a million annually.10 JPMC also houses the National Poisons Centre, where a large number of cases of self-poisoning are admitted every year. The ASH has the strength of 850 and caters a large number of patients, mainly from interior Sindh.11 All three hospitals have a 24-hour, 7 days a week emergency medical service and receive majority of cases of self-harm and suicides.

Patient and public involvement
No patients will be involved.

Study population
The target population will be all suicide and self-harm cases registered at MLCs of Karachi during the period January 2017 to December 2021. All those cases that fulfill the inclusion criteria will constitute the study population. The inclusion criteria include all male, female or transgender, of any age, registered as confirmed suicide or self-harm case at a MLC of Karachi, during the study period. The manner of death constructed as suicide based on the police report or inquest reports of the investigating officer. We will include all confirmed cases of self-harm and suicide even if the information is incomplete in records. The exclusion criteria include all suicide or SH cases that were not confirmed.

There are few important reasons for selecting the time period of 2017–2021 for our study. First, we were guided

<table>
<thead>
<tr>
<th>Source</th>
<th>Place of study</th>
<th>Duration of the study</th>
<th>Self-harm cases</th>
<th>Age</th>
<th>Male female ratio</th>
<th>Method of self-harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tharani et al25</td>
<td>Karachi, Sindh</td>
<td>2013–2017</td>
<td>350</td>
<td>Mean age: 28.7 years</td>
<td>1:2.2</td>
<td>Drug overdose and use of insecticides</td>
</tr>
<tr>
<td>Tahir et al26</td>
<td>Jamshoro, Sindh</td>
<td>2001–2008</td>
<td>154</td>
<td>Mean age: 31.21 years</td>
<td>0.55:1</td>
<td>Burning</td>
</tr>
<tr>
<td>Shahid et al28</td>
<td>Karachi, Sindh</td>
<td>January–December 2004</td>
<td>98</td>
<td>Mean age: 23.5 years</td>
<td>Majority females (63%)</td>
<td>Drug overdose</td>
</tr>
<tr>
<td>Zakiullah et al29</td>
<td>Karachi, Sindh</td>
<td>January 1997–August 2003</td>
<td>283</td>
<td>21–25 years</td>
<td>0.66:1</td>
<td>Poisoning with benzodiazepam</td>
</tr>
<tr>
<td>Syed and Khan30</td>
<td>Karachi, Sindh</td>
<td>1990–2006</td>
<td>69</td>
<td>&gt;14 years</td>
<td>0.59:1</td>
<td>Poisoning</td>
</tr>
<tr>
<td>Shahid et al31</td>
<td>Karachi, Sindh</td>
<td>2004</td>
<td>98</td>
<td>Mean age: 23.5 years</td>
<td>0.58:1</td>
<td>Drug ingestion, organophosphate poisoning</td>
</tr>
<tr>
<td>Patel et al32</td>
<td>Karachi, Sindh</td>
<td>2002–2006</td>
<td>202</td>
<td>Mean age: 17 years</td>
<td>0.69:1</td>
<td>Poisoning with benzodiazepam, anti-depressants</td>
</tr>
<tr>
<td>Shahid et al33</td>
<td>Karachi, Sindh</td>
<td>January–December 2005</td>
<td>60</td>
<td>Mean age: 31 years</td>
<td>66% female</td>
<td>Poisoning with benzodiazepam</td>
</tr>
<tr>
<td>Khan and Hanif34</td>
<td>Quetta, Baluchistan</td>
<td>2001</td>
<td>46</td>
<td>16–25 years</td>
<td>100% females</td>
<td>Poisoning</td>
</tr>
<tr>
<td>Ahmed and Zuberi24</td>
<td>Karachi, Sindh</td>
<td>1974–1978</td>
<td>167</td>
<td>21–30 years</td>
<td>5.8:1</td>
<td>Drugs, poisoning</td>
</tr>
</tbody>
</table>
by one of the coinvestigators (ST) of the study, who is based in the main office of the Karachi Police Surgeon, the site of our study. Second, patients’ record keeping system at public sector hospitals is not robust or organised so it would be difficult to access very old records of the patients. Hence, we selected the last 5 years that will be practically feasible and provide us with required information.

Sample size
We intend to review all medicolegal cases presented during the study period and will identify and extract medical records for self-harm and suicide cases. Referring to the studies done in the past, we plan to achieve an estimated sample of 15,000–20,000 self-harm cases\(^1\) and 500–1,000 suicide cases\(^2\) in the last 5 years.

Study tool
The study proforma has been developed after reviewing the medical records (medicolegal certificate, forensic autopsy report, police inquest report, MLO notes, death certificate) maintained at public sector hospitals. This proforma will be used to extract and record sociodemographic information and clinical characteristics related to suicide and self-harm.

Sociodemographic information include age, gender, education, marital status, religion, sect, ethnicity, residential area. Information related to suicide and self-harm include methods of suicide and self-harm, history of mental illness, previous attempts of self-harm, place of incidence, medicolegal autopsy, reason of suicide and self-harm. Addition of sociodemographic and clinical variables in the questionnaire will help us to analyse possible sociodemographic associations with act of self-harm or suicide. Moreover, this will provide us a bigger picture to understand the demographic construct of such cases. Since the tool has been developed by the research team, the pilot testing of the tool will be done on 30–40 entries and amendments will be made accordingly. The study tool is provided as an online supplemental file 1.

Data collection procedure
Data will be collected by research assistants (RAs) and supervised by research specialist (RS) who will be hired and trained in data collection. All research staff will be closely monitored throughout the study period by primary investigator (PI) and co-investigators of the study.

To get access to patients’ medical records, co-investigators of the study (ST) will facilitate us in gaining access to the data.

After determining the eligibility for inclusion, victims’ sociodemographic information including age, gender, marital status, religion, sect, ethnicity, occupation, residential area, date/year of presenting to MLC and so on will be extracted from medical record. Patients’ clinical features of suicide and self-harm including method of suicide/self-harm, reason of suicide/self-harm, police station involved, place of incidence, findings of medicolegal autopsy, history of self-harm and medical illness will be also noted from patient’s medical record (medical record included medicolegal certificate, autopsy report, police inquest report, MLO notes, death certificate). The PI will have frequent visits to study site and close contact with RAs and RS for quality checks.

The data collection started in December 2021.

Data analysis plan
The information obtained will be entered in SPSS V.19. We will perform descriptive analysis to report the pattern of suicide and self-harm cases across different MLC in Karachi city. Furthermore, sociodemographic and clinical information of suicidal and self-harm cases will be reported in descriptive manner (such as sex, age, marital status, education, occupation, autopsy, methods opted). To understand possible associations of sociodemographic factors with act of suicide and self-harm we will be doing bivariate analysis and cross-tabulations. To analyse associations between categorical predictors we will use \(\chi^2\) test of independence or Fisher’s exact test. To report possible correlations between categorical predictors and act of suicide or self-harm, we will be using spearman rank correlation coefficient.

Ethical considerations and disseminations
The study was approved for exemption from Aga Khan University, Ethical Review Committee (ERC # 2020-3375-8491). All possible measures would be taken to address anonymity and confidentiality. A unique study identification number will be assigned to each case which will be used throughout the study. All data will be kept in lock and key with the research team, and electronic files will be protected by a password. The raw data will be accessed only by the PI and the research team involved in data analysis. The findings of the study will be disseminated without revealing the identity of the research participants.

The findings of the study will be disseminated by conducting seminars for healthcare professionals and stakeholders including psychiatrists, psychologists, counsellors, MLO police surgeons, mental health nurses, general and public health physicians and policy makers. Findings will be published in local and international peer-reviewed scientific journals.

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Contributors MMK conceived the study, NA and MMK involved in concept mapping and planning of the study, ST, MMK and SP developed the study tool, FM and ST collaborated with study sites for the data collection, SP and AQ contributed to writing the study protocol and MMK critically reviewed. MZ involved in data analysis plan. MA intellectually contributed to the study. All authors read and approved the final manuscript.

Funding The study is funded by University Research Council, Aga Khan University, Karachi-Pakistan (ID # 211014).

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not applicable.

Provenance and peer review Not commissioned; externally peer reviewed.
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