

Systematic Review Suicide in Central Asia

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Abstract: Nearly 1.5 million people die by suicide each year globally. Most suicides occur in Asia, yet research has predominately studied suicide in the West. Suicide in Central Asia is under researched. A systematic review of the current state of literature on suicide and suicidal behavior in Central Asia is needed. The study aims to 1) examine risk and protective factors for suicide in the five Central Asian countries; 2) identify prevalence data on suicides in these countries; 3) assess treatments available for suicide prevention and intervention. Four electronic databases (PsycINFO, MEDLINE, CINAHL, and SocINDEX) were searched across 30 years between 1987 and 2016 to identify studies that reported quantitative or qualitative data on suicide in Central Asia. A total of 15 studies were included in this review. A total of 31 risk factors and 15 protective factors were identified. Core risk and protective factors identified can facilitate the development and adaptation of evidence-based interventions in this under-investigated region. A clear limitation of the study is the quality and quantity of the research available on suicide in Central Asia.

Keywords: Suicide; Central Asia; Kazakhstan; Kyrgyzstan; Tajikistan; Turkmenistan; Uzbekistan

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Suicide is a serious and complex problem facing the world. Annually, about 800,000 individuals die by suicide (Tandon & Nathani, 2018), 10-20 million attempt it, and 50-120 million are affected by the suicide of a relative or friend (Beautrais, 2006). Suicide and self-harm comprise 1.47% of the Global Burden of Disease (GBD) and contribute to 22.5 million Years of Life Lost (YLL) to premature mortality (Patel, Chisholm, Parikh, Charlson, Degenhardt, Dua et al., 2016).

No single factor or cause explains suicide, it is a complex outcome of biological, psychological, social, environmental, and cultural factors (Alonzo & Gearing, 2018). Almost two-thirds of all suicides occur in Asia (Tandon & Nathani, 2018); while the majority of suicide research occurs in Western and developed countries. Further, there is suspicion

about the quality and accuracy of suicide information across the countries in Asia and generally accepted that reported national suicide rates are unreliable (Tollfsen et al., 2012). Consequently, this gap in research has limited the investigation of suicide prevention and treatment in the five Central Asian countries which include Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.

Psychological autopsies demonstrate mental illness to be a major contributing factor for suicide (Arsenault-Lapierre, Kim, Turecki, 2004). In the western context, mental illness is reported to be a contributing factor to a majority of suicides. But in the context of low and middle income countries the influence of this factor is less pronounced (Patel, Chisholm, Parikh, Charlson, Degenhardt, Dua et al., 2016). In many Asian countries, suicide is often considered to be more of a social phenomenon rather than an individual act (Goldsmith et al., 2002). Consequently, socio-economic issues, familial issues,

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oppression and gender based violence, and other cultural factors appear to have a greater role in suicide.

The five republics in Central Asia became independent following the dissolution of the former USSR in 1991. The countries are going through severe growing pains as they continue to adjust to reality in a post-Soviet era (Ruffin, 1999). The rapid shift in economic, governmental and social-political philosophy, and the resulting unrest have further exacerbated the gaps in the countries' ability to see to the basic needs of its citizenry, such as primary health care, satisfactory education, sufficient jobs and income (Hegland, 2010). The Central Asian governments are burdened by the challenges inherited from the past Soviet system, existing corruption, limited resources, and weak infrastructure (Ruffin, 1999). In addition, this region has been managing with high rates of unemployment, particularly among the youth, often resulting in increased levels of labor migration to secure economic employment (Hegland, 2010). Nascent research in this area have highlighted a number of factors related to suicide among young people including economic hardship, interpersonal violence, migration and unmet basic needs (UNICEF, 2014).

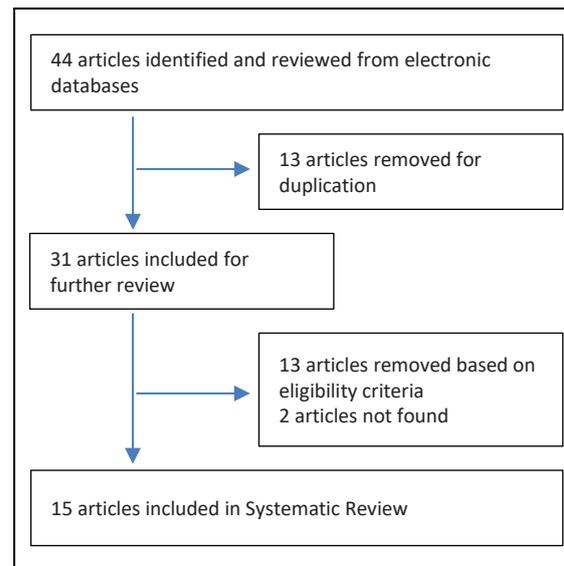
In struggling to address the myriad of needs, governments in Central Asia have either demonstrated no clear or minimal effort to develop systematic suicide prevention or intervention programs, or support research in this important area (Haarr, 2010). This lack of attention to suicide is not uncommon to other low income countries with limited governmental and public resources available for this issue. Effective research on suicide ideation, behaviors (i.e., suicide attempts and completions), and the prevalence of this phenomenon may support future governmental efforts to address suicide within their national borders and across the region. Thus, there is an urgent need to investigate suicide in this region.

This systematic review will lay the groundwork for further research and intervention in this area. This study aims to 1) examine risk and protective factors for suicide in these countries; 2) identify existing prevalence data on suicides in the five Central Asian countries; and 3) assess treatments available for suicide prevention and intervention. Through this systematic review, core risk and protective factors have emerged that can facilitate the development and adaptation of evidence-based interventions in this under-investigated region.

Methods

Four electronic databases (PsycINFO, MEDLINE, CINAHL, and SocINDEX) were searched across 30 years between 1987 and 2016 to identify studies that reported quantitative or qualitative data on suicide in Central Asia (see Figure 1). The Boolean search strategy matched the following criteria: (1) Central Asia or Kazakhstan or Kyrgyzstan or Tajikistan or Turkmenistan or Uzbekistan; (2) suicid* or self-immolation or *aintihar* (Arabic for suicide) or *samoubiystvo* (Russian for suicide); (3) published in the English or Russian languages; and (4) published as peer-reviewed. Exclusion criteria included: (1) studies that did not specifically include suicide, suicide attempts, or suicide ideation; (2) studies on suicide conducted exclusively outside of the identified Central Asian region; (3) review articles; (4) theoretical articles; and (5) letters to the editor.

Figure 1. Review and selection of articles.



The systematic search identified 44 eligible studies, 13 articles in PsycINFO, 21 articles in MEDLINE, four articles in CINAHL, and six articles in SocINDEX. Thirteen of these articles were duplicates and removed, and another two articles were removed as they could not be located. Of the 29 remaining articles, 27 were in English and 2 were in Russian. The articles included in this review were assessed and coded by the research team comprised of English and Russian researchers according to established criteria. Each eligible article was reviewed and coded independently by two authors, SS and RG reviewed the English articles and YF and MS reviewed the Russian articles, resulting in a final inclusion of 15 articles in the systematic review. Coding was completed using a data abstraction form, developed to synthesize findings from all eligible peer-reviewed

published studies. That data abstraction form was developed to systematically extract core study components (e.g., publication details, study design, sample); Central Asian country (e.g., Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan); suicide focus (e.g., ideation, attempts, completions); identified risk and protective factors; outcomes and findings; and any reported recommendations for suicide treatment, services or future areas of research. Discrepancies in coding were resolved through discussion and consensus and used to inform and modify the data abstraction form. Data abstractors' maintained over 95% inter-rater reliability across all articles.

Among the English articles reviewed and coded by SS and RG, the data abstraction form for each article had the following similar core study components; publication details, study design, sample and risk and protective factors. Minor discrepancies in the coding were found in outcomes and findings, reported recommendations and future areas of research which were resolved through discussion between the authors. Among the Russian articles reviewed and coded by YF and MS, the data abstraction forms had similar data except for one minor discrepancy, which was resolved through email communication with the Russian authors.

Each study was coded for demographics (i.e. population, sample size, age, and gender) and study characteristics (i.e. methods, suicide focus). In addition, studies were coded for suicide risk and protective factors. Risk factors identified for each of the research articles were grouped and classified into five discrete categories based on the conceptual content: (1) mental health factors; (2) family and community system factors; (3) socio-economic factors; (4) service utilization; and (5) environmental factors. Identified protective factors were grouped into three discrete categories: (1) mental health protective factors; (2) family and community protective factors; and (3) socio-economic protective factors.

The risk and protective factors were grouped together in the following categories: Mental Health factors, Family and Community factors, Socio-Economic factors, Service related and Environmental factors. Any factors reported by studies that included any mental health issues, for example, depression, bipolar disorder, schizophrenia etc were included in the MH factors. Also, substance abuse factors like alcohol or drug abuse were included in the MH category. Community factors included a host of factors related to the family and community system. These included physical and sexual violence, societal sanction of gender based violence, forced marriage, early marriage and family conflict. Socio-Economic factors included low educational attainment, work

conflict, husband's migration for economic reasons and poverty. Service related factors include lack of access to help and inadequate support available particularly for women and families. Environmental factors included higher temperatures in the summer months, exposure to radiation during the Chernobyl incident and exposure to trauma during the civil wars in Central Asia.

Results

A total of 15 studies were included in the systematic review (see Table 1). Six studies (40%) were published in the 1990's, four of the studies (27%) were published in the 2000s, and five studies (33%) were published in the 2010s.

Four (27%) out of the 15 studies investigated suicide in all five republics in Central Asia (Kazakhstan, Tajikistan, Uzbekistan, Kyrgyzstan, and Turkmenistan). Two studies (13%) focus on four of the five republics, with another two studies (13%) focusing on three of the five countries in Central Asia. Also, two studies (13%) focus exclusively on Kazakhstan, two (13%) on Tajikistan, two (13%) on Uzbekistan and one (7%) on Kyrgyzstan. Kazakhstan, Kyrgyzstan and Uzbekistan are the most studied countries while Tajikistan is least studied country.

Methodologically, the majority of the studies (k=10; 67%) used secondary data analyses, three studies (20%) used surveys, and four studies (27%) used mixed methods. Two studies (13%) employed qualitative analyses along with secondary data analysis. None of the studies investigated interventions, used randomized controlled trials (RCT), or quasi-experimental designs. Most studies used official country records, government demographic data, and the WHO country specific data on suicides. Only three of the fifteen studies (20%) collected their own data through surveys or semi-structured interviews.

Only six studies (40%) reported clear sample details. The unit of analysis varied from countries to individuals; whereas only three studies (20%) reported gender demographics. Clear methodologies, including sample details were poorly reported in the majority of studies. Thus, it is difficult to describe a standardized population in this systematic review.

The outcomes across the studies are varied and diverse. Fourteen of the 15 studies (93%) focus on suicide, four studies (27%) investigated attempts, and only one study (7%) reporting on suicide ideation. All 15 studies (100%) address prevalence rates, seven studies (47%) focus on associated factors including alcohol abuse, martial violence, radiation exposure, and air temperature or autopsy rate in the country. Two studies (13%) report on

quality and reliability of suicide data, one (7%) reports on trends by gender and age, and one (7%) reports on the geographical distribution of suicide. Over time, the research is beginning to investigate

more risk factors for suicide. Eight studies (53%) report on risk factors for suicide, with only four studies (27%) reporting on protective factors.

Table 1. Literature summary and demographics

Author	Population	Method	N	Male (%)	Suicide Outcomes	Suicide Focus			Risk factors	Protective factors
						S	SI	SA		
Bhalla et al., 2010	KY; UZ*	SDA	n/a	n/a	Prevalence; Quality of Suicide data	√			--	--
Grijbovski et al., 2013	KA	SDA	685	80	Prevalence; Associated with temperature	√			2	--
Haarr, 2010	TA	S, Qu	400+	0	Prevalence; Associated with marital violence; Ineffective help seeking		√	√	11	3
Kamarali et al., 1996	KY	Quantitative	5500	n/a	Prevalence; Associated with exposure to radiation	√			3	--
Kapusta et al., 2011	KY; KA; UZ; TU	SDA		--	Prevalence; Associated with autopsy rate	√			--	--
Khushkhudamova, 2010	TA	S, SDA, Qu	n/a	n/a	Prevalence; Associated with self-immolation	√			8	2
Petrov et al., 1991	KA	S, SDA	713	--	Prevalence	√		√	5	5
Rutz et al., 2004	KY; KA; UZ; TU	SDA	n/a	n/a	Prevalence; Trends	√			--	--
Shakirov et al., 2013	UZ	SDA	76	4	Factors associated with suicide by self-immolation	√		√	2	--
Varnik, 2012	KY; KA; TU	SDA	105 countries	--	Prevalence by gender and age	√			--	--
Varnik & Wasserman, 1992	KY; KA; UZ; TA; TU	SDA		--	Prevalence; Suicide & age; Influence of religious & cultural factors on suicide	√			--	5
Wasserman & Varnik, 1998	KY; KA; UZ; TA; TU	SDA, Qu	15 countries	--	Reliability of statistics on suicide and violent deaths	√			--	--
Wasserman et al., 1998	KY; KA; UA; TA; TA	SDA	n/a	--	Association with alcohol consumption	√			1	--
Wasserman et al., 1998	KY; KA; UZ; TA; TU	SDA	--	--	Prevalence; Suicide distribution in regions of the former USSR	√			--	--
Giasov et al., 2015	UZ	SDA	811	--	Prevalence; Association with intoxication; Gender distribution; Suicide methods	√		√	1	--
Total K=15						14	1	4	33 K=8	15 K=4

Risk factors

A slight majority, eight of 15 studies (53%) report on risk factors for suicide in Central Asia. In Figure 2, a total of 31 distinct risk factors are identified across the following categories; Mental Health factors, Family and Community factors, Socio-Economic factors, Service related and Environmental factors. There were three Mental Health risk factors for suicide identified, general mental health issues are reported as risk factors by three studies (20%) alcohol abuse is reported by three studies (20%), and depression is reported as a risk factor by two studies (13%).

The category of Family and Community System factors and Socio-Economic factors captured gender specific data. These risk factors are associated with

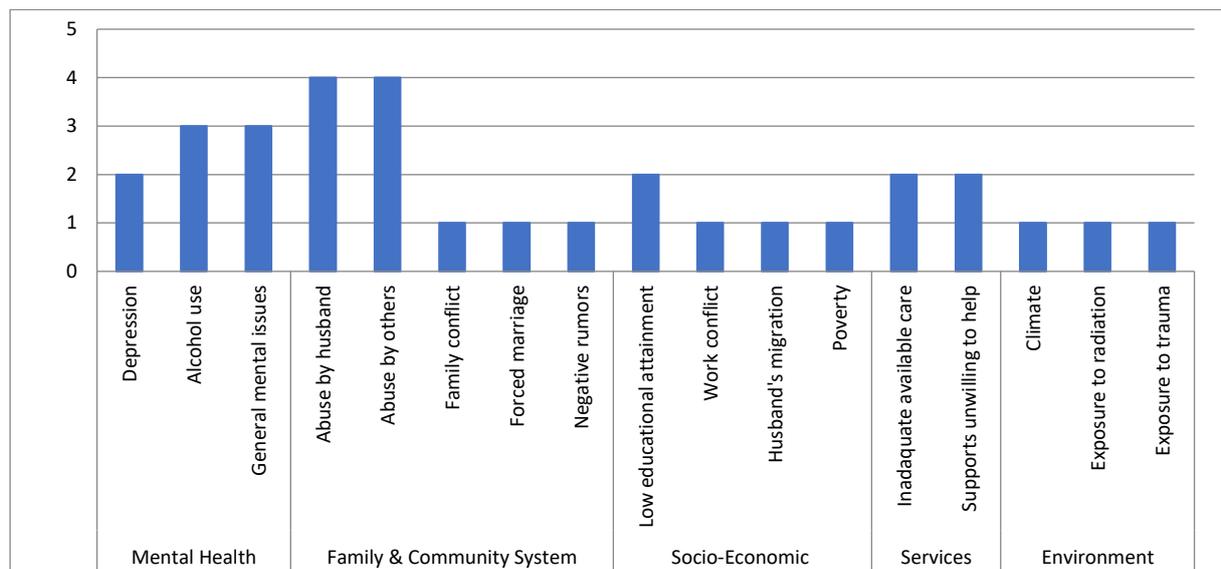
suicidal behavior among women. The most researched risk factor identified for women suicides is abuse by husband. A total of four studies (27%) report abuse by husband as a suicide risk factor. Husband's abuse includes past and current physical abuse, past sexual abuse, and a combination of past physical and sexual abuse. Abuse by other family members is reported as another important risk factor for women and was identified in four studies (27%). The studies report this abuse to include past and current physical abuse by mother-in-law. The combination of abuse by husband and mother-in-law is reported as an added risk factor for women. The other risk factors for women in this category are family conflict, forced marriage, and negative rumors with each being reported by one study (7%).

Under Socio-Economic category, risk factors included not finishing elementary school and generally low educational attainments were identified in two studies (13%). Conflict at work is reported by one study (7%), with both husband's migration for economic reasons and poverty being reported each by one study (7%) as additional risk factors for women. Under the Service Utilization category, unavailability of help and support for women is reported to be a risk factor by two studies (13%). For men and women, generally inadequate

medical care and limited psychosocial support are also reported to be risk factors in another two studies (13%).

Finally, in the Environment category, research posited that higher temperatures in the summer months is a risk factor in one study (7%), whereas exposure to radio-active materials was also found to be a risk factor in another study (7%). Lastly, exposure to trauma specifically during the years of the civil war is identified as a suicide risk factor by one study (7%).

Figure 2. Frequency of suicide risk factors by studies



Protective factors

Only four of the 15 studies (27%) researched protective factors for suicide in Central Asia (see Figure 3). A total of 15 distinct factors emerged and were categorized as Mental Health factors, Family and Community factors and Socio-Economic factors. In the Mental Health category, one study (7%) reports the absence of mental illness as a protective factor, and two studies (13%) found the absence of alcohol use as a protective factor. In the Family and Community category, one study (7%) indicated that marriage after the age of 15 years is a protective factor for women. The absence of marital abuse is found to be a protective factor for women in one study (7%). Two studies (13%) identified large family support systems, as well as strong religious and cultural traditions as protective factors. The four protective factors under the Socio-Economic category are specific to women. One study (7%) demonstrated that high educational attainment for women, in this case having secondary education is a protective factor against suicide. Two studies (13%) found women's employment outside the home to be a protective factor. Another study (7%) reported that women having professional employment is a

protective factor, and one study (7%) noted family economic well-being to be a protective factor for women.

Prevalence

Fifteen identified studies present prevalence data on suicide in Central Asia. Of these studies, six (40%) presented prevalence information drawn from the World Health Organization (WHO) mortality database, the largest central international archive of data on self-injury. In addition to using the WHO mortality database, seven studies (47%) also use official demographic and statistical data collected by the city and state. Only three studies (20%) collect new data on prevalence.

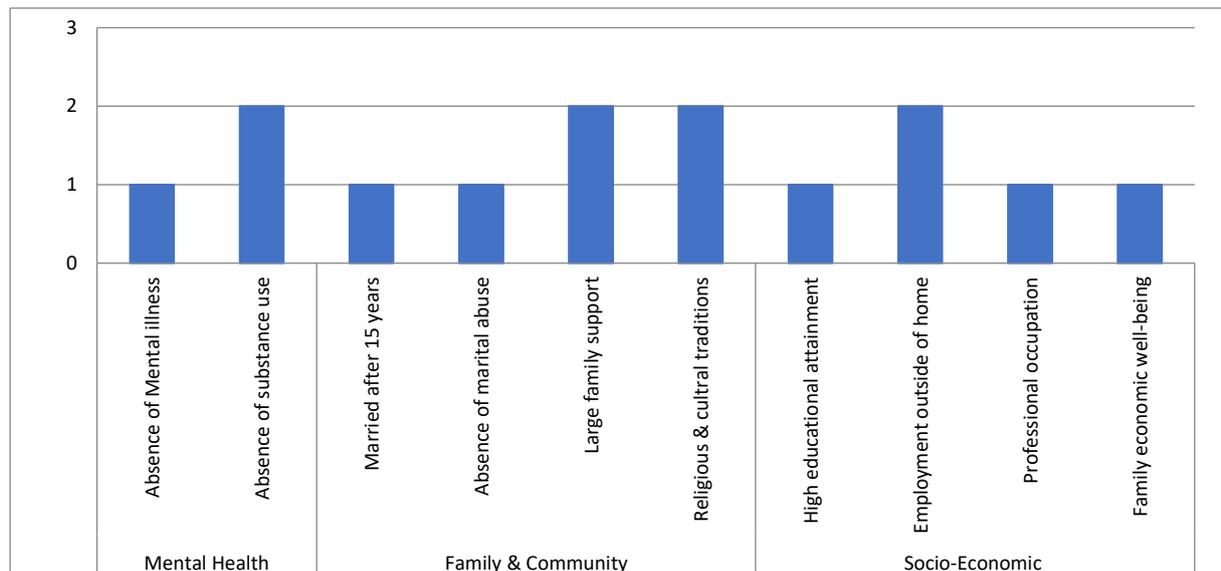
The global suicide rate has been estimated to be 10.7 per 100,000 individuals (WHO, 2015). According to the WHO, the definition of suicide falls within the larger construct of injury mortality. Suicide accounts for an estimated 1.4% of the total world mortality (WHO, 2015). In 2015, the WHO data on country specific suicides, report the rates of suicide per 100,000 people across Central Asia as: Kazakhstan 48.1; Turkmenistan 15.8; Uzbekistan 13.6;

Kyrgyzstan 13.4; and Tajikistan 7.2 (WHO, 2015). Beyond the WHO, in Central Asia, only two (Kyrgyzstan, Uzbekistan) of the five countries are reported to have reliable national data on causes of death.

Of the studies that generate new data, one study generates data on the prevalence of suicidal behavior among women who have experienced marital abuse through surveys and focus groups. Data from this study indicates that women who experienced physical violence were at a greater risk of experiencing suicidal thoughts (36.2%) and

attempts (10.6%) (Haarr, 2010). One study investigates 76 inpatients in a Burn Center and finds a history of mental illness, economic hardship and oppression of women to be associated with an increase of attempted suicide by self-immolation (Shakirov, 2013). One study investigated suicide by researching newspaper reports, conducting surveys and in-depth interviews and determined that political conflict, interpersonal conflict, forced marriage, mental illness, poverty and unemployment are associated with suicide by self-immolation among women (Khushkhudamova, 2010).

Figure 3. Frequency of suicide protective factors by studies



Clinical and Research Recommendations

Nine studies presented specific recommendations on suicide in Central Asia, including: eight of the studies positing research recommendations; three studies presenting clinical recommendations; and three studies highlighting educational or policy recommendations. The research recommendations included the development of death registration datasets to facilitate future estimates of cause-specific injury mortality (Bhalla et al., 2010). One study suggested further research on existing datasets of the national autopsy rate and national suicide rate (Kapusta et al., 2011). Whereas, another study recommended using longitudinal methodology to understand political changes over time on suicide rates (Varnik and Wasserman 1992). The last study recommended more in-depth qualitative interviews to further examine attitudes towards suicide (Wasserman & Varnik 1998).

One study recommended the collection of biological mechanisms to assess any association between environmental temperature and serotonin level (Grjibovski et al., 2013).

Another recommended future research that would examine the relationship of marital violence to suicide (Haarr 2010). In addition, another study recommended future research on social and medical hygiene, a branch of knowledge aimed to improve social conditions of health practices and the impact of external factors on human health (Petrov et al., 1991). Research into adolescent suicide was also recommended, with specific attention on the future examination of potential causes (Rutz et al., 2004). Clinical recommendations suggested the development of victim support services, including specific medical care for abused women and training for medical care personnel regarding abused women (Haarr, 2010). One study recommended that specific prevention and treatment methods should be developed to target females, specifically related to suicide by self-burning (Shakirov 2013). Another study recommended improved follow-up of youth suicide attempters and understanding of changing patterns in suicide methods to better inform the development of national suicide prevention programs (Rutz & Wasserman, 2004).

Education and policy recommendations centered on improving awareness and education about marital violence as a contributor to suicide across healthcare providers, justice officials, and the public (Haarr, 2010). Another study recommended research on social hygiene; a scientific branch of study aimed at investigating the impact of social conditions on health with the goal of enhancing health and increasing life-span (Petrov et al., 1991).

Discussion

Annually, Asia accounts for almost two-thirds of all suicides (Tandon & Nathani, 2018), thus suicide disproportionately impacts developing countries (Alonzo & Gearing, 2018). The five republics comprising Central Asia are unique as these low and middle income countries are relatively young, having gained their independence from the former Soviet Union. In addition, post-Soviet Central Asia rapidly transitioned with minimal preparation from a socialist system with guaranteed incomes and state infrastructure to an unfamiliar new free market economic system. Research into suicide in this area of the world emerged following independence. However, this research was limited and frequently piecemeal with no concerted effort to systematically examine the phenomenon in terms of research, policy or practice.

From this systematic review, risk factors for suicide in Central Asia can be categorized across five major domains: 1) Mental Health; 2) Family and Community System; 3) Socio-economic Issues; 4) Services; and 5) Environmental. Interestingly, the majority of the risk factors do not relate to the individual, rather are predominantly focused on family, social and environmental context. Consequently, suicide in many Asian countries is often contextualized as a larger social phenomenon rather than an individual act (Khan et al., 2016). Consistent with the larger literature on suicides in low and middle income countries, this review has found suicide to be associated with familial, social and economic factors in addition to mental health issues (Patel, Chisholm, Parikh, Charlson, Degenhardt, Dua, et al. 2016).

An overwhelming majority of suicides in the world occur in the low and middle income countries of the world where resources and services for identification and intervention are very scarce (WHO, 2017). Over 60% of the world's suicides happen in Asia (Chen et al., 2012). This number is striking given that suicide data are not available for about 20% of Asia's population (Vijayakumar, 2008) due to several social, cultural and religious factors. When the substantial underreporting of suicides is taken into account, the overall suicide rate in Asia is about 30% higher than

the global average (Chen et al. 2012). It is noteworthy that female suicides are far more prevalent in the poorer countries of the world. This becomes significant in the context of gender specific risk factors for women in these countries (Vijayakumar, 2015; Chen et al., 2012). Within the poorer nations, suicides are more prevalent among the already marginalized and discriminated groups of society like refugees and migrants, indigenous peoples, and women (WHO, 2017). The social scientific study of suicide in the Global South is sorely lacking and crucial to understanding the scope, scale, and cultural nuances of suicide among populations where it is most prevalent.

Within existing literature on suicide in Asia, there is much evidence to support that socio-economic issues, familial issues, oppression and gender based violence, and other cultural factors appear to have a greater role in suicide in Asia (Vijayakumar, 2015). In many Asian countries, societies are less individualistic and tend to be more collectivist. The influence of family norms and traditions, societal expectations, socio-economic pressures and culturally specific meanings of suicide are crucial. (Lester 2011). Therefore, in many Asian countries, suicide is often considered to be more of a social phenomenon rather than an individual act (Khan et al., 2016).

Globally, there is a significant and consistent relationship between unemployment and suicide (Nordt et al., 2015). Yet, the interplay of economic and social forces cannot be understated. Increases in social vulnerabilities like divorce and mental health issues may also result in both unemployment and suicide (Mishara, 2008). Among Asian men, unemployment or job-related stress is found to be a more common trigger of suicide compared to men in the developed nations of the world (Amagasa, 2005; Phillips, 2002). Acute life stresses such as job loss, gambling, and work related factors are important precipitants of suicide among Asian men (Amagasa, 2005; Phillips et al. 2002; Wong et al. 2010). Financial problems are also more commonly found among suicides in Asia than in the West (Liu et al. 2009). Interestingly, economic issues and poverty are significant issues found in suicides in Central Asia.

Among the identified risk factors, 11 specific factors center on marital and family violence and gender based oppression. This finding is also consistent with research on suicide among women in the developing countries, which has found that violence against women is a strong predictor of suicide attempts (Canetto, 2015; Devries et al., 2011; Khan 2005, Vijayakumar et al., 2005). Research has often found that being single, unmarried, separated, divorced, and widowed is a risk factor for suicide (Stack 1998); however, most of this research comes from

developed countries. For women in developing countries, there is less evidence that marital status is a risk factor for suicide (Aliverdinia & Pridemore, 2009). Rather, studies have found that marriage is not necessarily a protective factor against suicide (Alonzo & Gearing, 2018; Phillips et al. 2002; Vijayakumar, 2015). This may be partially explained by the characteristics of family relationships in Asia. Extended family systems are a dominant feature of traditional Asian societies. Individual interests in such contexts are secondary to those of kinship or family. In such a family system, young married women have the lowest social status in the hierarchy within the family. A crucial precipitating factor for suicide among women in many Asian countries are family disputes (Vijayakumar, 2008). Stresses associated with arranged and very early marriage; young motherhood, sexual and physical violence, economic dependence make women more susceptible to suicidal behavior (Vijayakumar, 2015). This phenomenon has also been found among immigrant women in the more developed countries. Demands for upholding chastity, forced marriage, family pressure to stay within an unhappy marriage were among the factors associated with suicidal behavior among immigrant women (Montesinos et al., 2013; van Bergan et al., 2009). A meta-analysis looking at thirty-seven papers found a consistently strong relationship between intimate partner violence and suicidality (McLaughlin et al., 2012).

A number of studies find suicidal ideation and nonfatal suicidal behavior among Muslim women to be a response to family problems (Canetto, 2015). Family problems are common to women living in highly patriarchal societies with strict gender roles. However, researchers investigating suicide among Muslim women document that the problems faced by Muslim women within their families are severe; including early marriage, forced marriage, restrictions on educational attainment, restrictions on obtaining employment outside the home, restrictions on movement, expectations of bearing a large number of children and severe abuse within the marital home; with no recourse to any help, support or escape whatsoever (Canetto, 2015). The significant differences between the factors that are associated with suicide among women in traditional Muslim societies versus women in western liberal societies are indicative of the fact that suicide as a phenomenon has to be studied in its own cultural context for it to be meaningful.

The findings in this systematic review is consistent with the broader research on suicide among men and women in low and middle income countries. More research targeting suicidal risk and protective factors, particularly among women is warranted in Central Asia. Research investigating the

effectiveness of interventions targeted to mitigate violence against women in the cultural context of the Central Asian countries is needed.

Overall, the protective factors identified include the absence of mental health issues, the absence of violence and the presence of family support, and improved socio-economic conditions to protect against suicide. This research is consistent with the findings in both developing and developed countries (Suicide Prevention Resource Center & Rodgers, 2011). These findings coupled with existing intervention research from low and middle income countries highlight the need to target low resource psychological interventions for common mental disorders (Singla et al., 2017). Adapting low cost, low resource interventions to the Central Asian context that offers psychosocial support to families to address the issue of suicide is needed. Such interventions may benefit by incorporating specific materials to address the issues confronted by females.

In the last thirty years, only 15 studies were identified that examined suicide in Central Asia. Most studies were published in the 1990s; this was the time that the Central Asian Republics were gaining independence from the Soviet Union. Overall there is a dearth of research in this area and the quality of the research is limited. Most studies investigating suicide are relying on older established data sets, not reflecting the current and recent social changes. Few studies use limited surveys to collect new data. No evidence of systematic effort by educational institutions, government or non-governmental organizations were identified that comprehensively examines suicide within Central Asia.

Prevalence research overwhelmingly focused exclusively on suicide deaths, with few studies investigating suicide ideation or attempts. Despite an over reliance on existing data sets, suicide trends in the Central Asian countries reportedly were stable over a period through the 1990s (Wasserman & Varnik, 1998), but newer data remains unavailable to access prevalence. The study also finds high variability in the suicide rates between the different countries in Central Asia. Future research is needed in the field to more fully identify risk factors associated with suicide ideation or attempts.

Existing data on suicide in Central Asia lacks nuanced attention to sub-populations and geographical regions. A large majority of the population across the five Central Asian republics subscribe to Islam, which strictly forbids suicide (Gearing & Alonzo, 2009). Also, suicide in general is highly stigmatized and there may be a desire to conceal it under the category of accidents. Consequently, challenges to collecting data may include stigma and religious

barriers. Investing in determining accurate statistics on suicides and suicidal behavior among sub populations (e.g. women, youth, and older adults) including ideation and attempts is important and necessary to ascertain the variance in the suicide rates. Maintaining data would also assist with international comparisons and highlight service needs in the region. The development of national strategy on identifying, reporting suicides and suicidal behavior accurately across geographical regions and sub-populations in the Central Asian Republics may serve as a forum to advance preventive strategies and interventions as well as suicide research.

This review found no study investigating or examining any suicidal prevention, psychotropic drugs or psychological interventions that were used or could be used for suicidal individuals. Future research on identifying low cost, evidence-based treatments that can be adapted to the Central Asian context may begin to address this gap in the literature. The literature on mental health interventions, addressing gender based oppression and improving access to services from other low and middle income countries is also recommended.

No study is without limitations, in this study a clear limitation is the quality and quantity of the research on suicide in Central Asia. Due to the limited number of studies investigating risk and protective factors, it is possible to not be careful to avoid generalization of these findings. Also, the inclusion of only peer-reviewed published studies may have limited the scope of this review. Additionally, the heavy reliance on identified research on a limited number of existing and dated data sets is a limitation. Similarly, the development of new research data, rather than the reliance on secondary data, may skew findings and remain a limitation in countries undergoing significant change. An absence of RCT or quasi-experimental studies is a limitation to developing preventative and intervention work in this region.

Conclusion

This systematic review is an important contribution to the field, as it lays the groundwork for more targeted research to be initiated. It also paves the way for investigating effective and culturally receptive clinical interventions and treatments for this population. Mental health intervention research from other low and middle income countries have demonstrated low cost, low resource intensive and culturally acceptable interventions to be effective (Singla et al., 2017). Such interventions have promise of being adapted to the context of Central Asia. It is recommended that such evidence-based interventions be adapted to the local culture and

environment. Future research would need to explore the effectiveness of these adapted interventions.

Suicide varies across the world due to culture, context, and environment. To effectively develop preventative strategies and interventions for suicide in Central Asia requires more targeted research to the unique cultural, family, and social context, of these Central Asian Republics. Although mental illness is important, the larger context and traditions have an elevated role. In developing prevention and intervention for suicides in Central Asia, this larger context would need to be considered.

Future research on suicide that is more nuanced in studying sub populations and at risk populations (women and youth) will be beneficial to obtaining more precise data on prevalence within these sub populations. Also, suicide research on specific ethnic groups within certain provinces in Central Asia will be advantageous in targeting intervention strategies specific to those populations. Existing data on suicide in Central Asia are largely focused on actual deaths. Targeted research on suicidal behavior including thoughts and attempts will be valuable in providing timely intervention to those who are considering suicide.

Clinical recommendations include establishing services that can provide psycho-social support to individuals and families for a host of issues including mental health intervention. Services specifically targeted to women have the potential of preventing suicides in Central Asia.

A national strategy on suicide prevention and intervention in the Central Asian countries is a much needed step in grappling with the issue of suicide. Allocation of federal funds and resources to this effort can generate systematic effort among researchers, policy makers and clinicians in combatting the issue of suicides in Central Asia.

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