REVIEW

Suicide in the geriatric population of South East Asia - contexts and attributes [version 1; peer review: awaiting peer review]

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Abstract
Suicide in the geriatric population is a significant problem. Increasing age, living alone, having a psychiatric illness and medical comorbidities have been identified as risk factors for suicide among the elderly population. The elderly population in South East Asia is rapidly growing and the number of elderly people with mental illness and/or medical comorbidities is also increasing. The factors and attributes of suicide may vary from region to region due to socio-cultural and geographic diversities. Understanding these factors may help in planning suicide prevention strategies for the elderly population. There is a dearth of studies assessing the demography, risk factors for, and prevention of suicide among the elderly population in South East Asia. We tried to observe and explain the challenging paradigms to excerpt attributes and the context of geriatric suicide. It is observed in this review that lack of social integration or interaction along with some psychiatric disorders leads to suicidal ideation and completed suicide in the elderly. South East Asia has unique characteristics in several aspects like religious and cultural diversity, poverty, unemployment, demographic structure of the region, migration, natural disasters and calamities, political environment, poor policy implementation, and easy access to suicide means (e.g. pesticides). Primary care physicians, specialized mental health support, gate-keeper training, means restriction, raising awareness, supportive family environment, and dedicated call centers could be potential areas for suicide prevention among the elderly people of the region. Further studies are warranted to formulate effective suicide prevention strategies.
Keywords
Geriatric suicide, South East Asia, Suicidal Behavior, Depression, Suicide prevention

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Suicide in the geriatric population is a significant problem. The geriatric population has unique issues like retirement, loss of job, dependency on others for daily needs, loss of spouse/close friends, medical illnesses, loneliness and isolation, which makes them vulnerable for enormous distress. Suicide is often multifactorial and the result of close, intense interaction between several biological, psychological and social factors. In a retrospective study over 37 years, it was found that negative mental state is an important predictor of suicide in elderly, whereas chronic medical illness and significant psychological distress are important predictors of suicide in older men. As per the report of the American Association for Marriage and Family Therapy (AAMFT), in the United States (US), suicide in older adults is responsible for 18% of all suicide related deaths, though older adults represent 12% of the US population. Increasing age, being separated from their spouse, and being a white male are important determinants of suicide in older adults. However, having a psychiatric illness, particularly depression, is also an important predictor of suicide in older adults. The elderly population in South East Asia is rapidly growing and the number of elderly people with mental illness and/or medical comorbidities is also increasing rapidly. Hence, it is anticipated that the number of suicides among the elderly population will grow significantly. So, it is obvious that the contexts and attributes of suicide in the elderly population will be different from that of adult population. The suicide rate in the South East Asia region was estimated to be 17.7 per 100,000 population. The rate of suicide in the elderly population and adolescents is found to be higher than the adult population and there is gross variation in the prevalence of suicide across the South Asian countries. Hanging is found to be the common mode of suicide in older adults.

In the South East Asia region, the male to female suicide ratio is higher (close to 1) than the rest of the world (3:5). The factors and attributes of suicide may vary from region to region due to socio-cultural and geographic diversities. Understanding these factors may help in planning the suicide prevention strategy for elderly population.

Suicide in South East Asia
It has been reported that 10% world’s suicides take place in India, Pakistan and Sri Lanka. Jordan et al.(2014) cited in their scoping review that the suicide rates in South Asia can be compared to the global average and it is men who commit suicide than the women. The suicide rate among the South Asian population ranges between 0.43/100000 to 331.0/100000 of the population and the rate varies between countries, and is mainly linked to the development levels (countries with different developmental indexes have different suicide rates; there is also significant regional variations). Various researchers conducted studies at various points of time in different regions and found gross variations in suicide rate. The prevalence rate of suicide in studies conducted in India ranges between 11.7 per 100000 population to 189.0 per 100000 population, whereas in Bangladesh (6.6 to 128.8 per 100000), Pakistan (1.1 to 14.9 per 100000), Nepal (7.0 per 100000) and Sri Lanka (19.6 to 24.1 per 100000) the rates are different, indicating the loco-regional variations.

Arafat et al.(2021) shared that hanging and poisoning were the most common suicide methods in Bangladesh and India, and poisoning was the preferred method of suicide in Sri Lanka. However, their review concluded that hanging is the most common method of suicide in South Asia. In India, most suicides are reported as due to personal or social reasons, followed by health and other reasons. Chandrasekaran and Gnanaselane (2008) investigated the predictors of repeated suicide attempts of 348 samples from India and found that repeat suicide attempts are associated with depression, hopelessness and suicidal intent, and presence of major depression and social distress are predictive factors for repeat attempts.

A recent scoping review by Arafat et al. (2022) revealed that the prevalence of depression among fatal (37.3%) and nonfatal suicidal attempts (32.7%) in South Asian countries seems to be lower compared to other regions of the world. In another research, Arafat et al. found that the presence of preexisting psychiatric morbidities and stressful life events are the most common risk factors for suicide in South Asia.
Epidemiology of suicide in geriatric population

The rapid growth of the geriatric population is one of the important facts of the 21st century. Suicide among the elderly people is considered as a major public health concern and it is associated with complex underlying psychosocial, physical and mental health issues faced by the elderly population. Additionally, marital conflict, feelings of hopelessness due to being alone, and being a widow are the potential risk factors for suicide among the older population.

Suicidal behavior among elderly population is grossly under-studied in Bangladesh. One recent review identified only one study assessing the depression and suicidal thoughts among rural elderly people of Bangladesh. The study revealed that 23% of 625 participants had suicidal thoughts. The frequency of suicidal thoughts was significantly higher among illiterate persons, women, and those living without partners. Living with family members and having a good contact with them were identified as protective factors in Bangladesh. Amudhan et al. (2020) analysed the national mental health survey data from India and reported that India accounts for 26.6% of global suicide deaths, and that the prevalence was higher among those over 60 years of age. However, Philip et al. (2022) found that there is a slight modest increase in the suicidal rates among people 60 years and over and the rates were higher among elderly women compared to elderly men in India.

Shoib et al. (2020) found that depression along with hopelessness are the key contributing factors of suicidal behaviours among the geriatric population in Kashmir, India. In Sri Lanka, about 23.6% of deaths among the elderly population were reported to be suicides.

Gender and age

It is reported that among all World Health Organization (WHO) regions, the highest suicide rate occurs in the South East Asia region. A 37 year retrospective study that mined the data between 1979 and 2015 (from the records of autopsy and police reports of suicide) revealed that gender is a major risk of suicide in the elderly population with men being more affected than women, which was already reported in the younger group. This might be because women generally tend to express their feelings and try to vent their frustrations if someone asks generously and properly. Whereas men generally don’t wish to share their feelings and emotions due to their own habits and rules.

Another attribute leading to suicide is advancement in age, which might be due to increasing degeneration and deterioration in bio-psycho-physical activities as well as a loss of individuality. The retrospective study revealed that as longevity increased, the shift in suicidal age was prominent as the affected group shifted from 60-69 years in 1990 to 70-79 years in 2015.

Living arrangements

In general, it is observed that the elderly had previously loved living in a joint family set-up. When they are suddenly confined to a room due to various reasons, or their social circle is restricted, or they have to migrate from one place to another place, or their partner dies, their entire way of living changes. Life-changing situations can adversely affect elderly populations. Some studies reported that India, Sri Lanka, Japan, Taiwan, and China have high suicidal rates in rural areas.

In rural China, the suicide rate is reported to be 2-3 times higher than in urban areas, and the rate of suicide among residents of North China is quite high. It is reported that persistent loneliness leads to suicidal thoughts. It is also reported that those with economic difficulties have higher reported suicidality. Unfortunately, data related to suicide among economically dependent elderly people is not readily available.

Health issues and distress

A study from China observed that a person with physical or mental health issues, especially with chronic illnesses and/or any sort of physical disabilities, is also at risk of suicide, and in certain conditions disturbed neurotransmitters (decreased level of serotonin) lead to suicide in older persons. Psychiatric morbidity is a major cause of suicide in the geriatric population. Among psychiatric disorders, mood disorders were found to be the most significant reason for attempting suicide. The same author reported that among the elderly, approximately 65% of all suicides were due to a psychiatric disorder.

A review related to the psychological autopsy of the SEA region, which is related to suicide amongst the overall population, reports variable estimates for various countries ranging between as low as 5% to as high as 95%. It is also stated that around 5% of suicides may be committed due to sub-clinical conditions. It can be said that poor mental health conditions or persistent stress can lead to suicidal thoughts in each segment of the population, and thus in the elderly. Studies report that elderly people with mild dementia often commit suicide. The suicide rate among the patients with dementia (within in first year of diagnosis of dementia) is 26.42 per 100000 person a year.

It is observed by the study that lack of social integration or interaction along with some psychiatric disorders leads to suicidal ideation and completed suicide in the elderly. An Indian study reveals that elderly people with past psychiatric history often make repeated attempts to commit suicide; the study also states that, generally, elderly people who plan for suicide often have co-morbid physical illness, mental illness (particularly depression), and a family burden of psychiatric illness. A study from Korea reports that strong bonding and informal support play gatekeeper roles and help in...
preventing suicide. Another study from Sri Lanka reports that elderly people with a lower social network develop depressive symptoms which further leads to suicide. Some studies from China, Bangladesh, and Indonesia reveal that lack of friendship, less familial support, frequent harassment, quarrel among peers, worrying, loneliness, unhealthy dietary practices, alcohol use, and inactiveness can all lead to suicide or suicide attempts among youth and adults.

In summary, it can be said that a male older adult, who has a dependency, resides in a rural area, has any ailment but especially psychiatric illness (depression) or a mild level of dementia or disability, has neither formal nor informal support, or lives alone, and feels withdrawn from society, is at risk of developing negative emotions and committing suicide, and such factors need to be taken care of.

How is South East Asia different from the rest of the world with respect to epidemiology, context and attributes of geriatric suicide?

As discussed above, given its high rate of suicide, South East Asia can be considered the hub of suicide. There are certain factors that make the South East Asian population unique and different from the rest of the world. These factors are:

1. Religious and cultural diversity: South East Asia is the hub of multiple religious practices. Different religions have different notions related to suicide. Some religion condemn suicide considering it as a sin; whereas several religions glorify self-sacrifice. This largely influences the suicidal behavior.

2. War and terrorism: War and terrorism are common in certain conflicting zones (Pakistan, Afghanistan, India, Sri Lanka, Myanmar) of South East Asia, which adversely affects the mental health of elderly population. Due to war and terrorism, there is significant disruption of social integrity, support systems, supply chain, and a spread of fear; which may attribute to mental illnesses and suicidal behavior.

3. Poverty: In South East Asia, poverty is a major social challenge. Poverty is considered as an important indicator of mental health. It may adversely affect the mental health of the elderly population.

4. Unemployment: Unemployment is a common challenge in the South East Asian countries and it is higher among the elderly population as there is gross lack of job opportunities for elderly people in this region.

5. Population explosion: South East Asia contains a large percentage of the global population, including the population of elderly people. It is anticipated that over next few decades the population of elderly in South East Asia will grow exponentially, creating a major challenge for healthcare resources.

6. Migration: Poverty, unemployment, war, terrorism and natural calamities are the major factors responsible for migration and displacement of elderly population in South East Asia. Migration may have several mental health implications.

7. Natural disasters and calamities: Natural disasters and calamities hit the South East Asian countries very often causing devastation. The elderly population are among the worst sufferers. Mental health is seriously affected by the natural disasters and calamities.

8. Political instability: Political instability produces significant social chaos, which is commonly seen in countries of South East Asia.

9. Economic instability: Economic instability often results in poverty, price hikes, and unemployment, which significantly affect mental health.

10. Poor policy implementation: Several policies do exist for the benefit of elderly population in South East Asian countries; however, due to poor implementation, the elderly population remains deprived from facilities and faces several challenges.

11. Easy access to suicide means (e.g. pesticides): The selection of mode of suicide depends upon the access to the means readily available. In the South East Asian countries easy access to pesticides, and several other suicidal means, results in adoption of easy modes of suicide.

Marriage, divorce, and alcohol consumption are other important determinants of suicide. The geriatric population is increasing globally, including in South-East Asian countries. It has been anticipated that the geriatric population of
South-East Asia will rise exponentially by 2050, and thus the suicide rate and total number of suicides in the geriatric population will also increase.48

Research evidence suggest that during the period of economic crisis (1997-1998), there was an increase in suicide rates in most South East Asian countries.47 The increase in suicides cannot be exclusively attributed to the financial crisis, however. Evidence suggests that in South East Asia, affluent countries have a higher suicide rate,49 which indicates that there may be other attributing factors, specific to countries and regions, which are associated with suicide.

Grief is an important modulating factor for suicidal behavior, and complicated grief is common following natural disasters. As South East Asian countries commonly encounter natural disasters, their significant impact on mental health and suicidal behavior cannot be ignored.50

The COVID-19 pandemic affected the elderly population significantly. Lockdown-related restrictions, medical morbidities, isolation, limited recreational opportunities, loss of spouse and fear of COVID-19 had a cumulative effect that affected the mental well-being of the elderly population significantly.51 There are significant regional variations in COVID-19 globally, and South East Asia was one of the worst affected regions. Comparisons of suicide rates between 1979 and 2014 revealed that Taiwan, Hong Kong, and Japan have lower male to female suicide rates in comparison to Australia and New Zealand in the adult population; however, in the elderly population the suicide rate varies across the countries.52 Similarly, there is also a difference in mode of suicide in different age groups, and across rural and urban areas.53

From the research perspective, a significantly higher number of suicides are occurring in South East Asian countries; however, most researches on suicide are from developed countries like the USA, UK, Australia.54 Whatever research data exists, mostly are in reference to completed suicide.54 Though the number of suicide attempts are much higher than the number of completed suicides, the research on these population are sparse.

**Prevention of geriatric suicide**

Prevention of suicide among the geriatric population is still an untapped area in South Asia due to a dearth of studies assessing the risk factors for suicide in the region. Adequate research assessing the risk factors and effectiveness of interventions, identifying local resilience factors, trained manpower, funds, and proper services settings is necessary to prevent suicide in the geriatric age group in SEAR. Likewise in other age groups, the biopsychosocial approach could be attempted in SEAR countries.14 Medications can be considered to treat depression or psychiatric disorders as a biological approach, problem solving psychotherapy, cognitive behavior therapy, or other appropriate approach of psychotherapy can be used as a psychological approach, and finally managing social events and ensuring a supportive social environment can be targeted as a social approach.

**Primary care physicians**

Identification of psychiatric disorders, especially depression, would be an important prevention strategy in the region. It is well accepted that timely initiation of treatment of depressive disorders can prevent suicides.34 Although the psychological measures have shown efficacy in developed countries, studies are warranted in SEAR countries due to its different socio-demographic pattern, manpower, and social structure.14 In old age there are various forms of physical comorbidities for which older people attend health appointments more frequently than those of adult age. Therefore, regular screenings of depressive symptoms, any recent evidence of increased substance abuse, and suicidal thoughts would be able to identify the at-risk individuals earlier. Referring the risky individuals to the mental health services providers would help in suicide prevention.

**Specialized mental health services**

Geriatric psychiatry is yet to gain momentum in SEAR as a full-blown discipline. There is an extreme dearth of specialized services in countries like Bangladesh, Myanmar, Nepal, and North Korea. Therefore, in addition to the improvement of primary care settings, geriatric mental health services should be prioritized and empowered to treat psychiatric disorders and prevent suicides.

**Gatekeeper training**

Likewise in other groups, gatekeepers could play a vital role in suicide prevention in geriatric groups. Primary care physicians, caregivers in residential care homes, and close family members could act as gatekeepers. However, it is supposed to be challenging to provide trainings except to the primary care physicians because, due to cultural barriers, training to residential care homes and family members may face resistance. Multilayered suicide prevention strategies ensuring adequate co-ordination between universal, selected and targeted strategies could be attempted and tested.55,56
Means restriction
Means restriction is the restricting of access to potential methods of suicide. This includes the class I pesticide ban, creating barriers to open bridges, etc. Means restriction has been established to have a positive impact on suicide prevention. However, it should be contextualized based on country, culture, and methods. A previous study from Sri Lanka has shown that banning of lethal pesticides has reduced the suicide rate.

Raising awareness
Raising awareness among the general population, family members, and caregivers in care homes regarding the risk factors and suicidal behavior in old age should be prioritized to prevent elderly suicide. It is important to consider that the residential care home service concept is different in western countries to SEAR countries. Improved mental health and suicide literacy and reduced stigma towards suicide would help to identify at-risk elder individuals.

Supportive family environment
Elderly persons living in nuclear families with working sons/daughters and their spouses are alone for the whole day, especially in the cities of SEAR. Elders living alone with physical comorbidities are at a higher risk of suicide.

Call centers
A dedicated telephone help line has shown positive effects in suicide prevention among isolated elderly persons in Italy, which needs to be tested in a South Asian culture.

Conclusion and future directions
Suicide among the elderly population is a serious issue. Ageing, living alone, having a mental health condition, and having coexisting physical conditions have all been recognized as risk factors for suicide in the older population. In South East Asia, both the elderly population and the number of elderly people with mental illness and/or medical comorbidities are growing quickly. Due to geographic and socio-cultural differences, there may be regional variations in the causes and characteristics of suicide. Planning the elderly population’s suicide prevention approach may be aided by having a better understanding of these issues. Studies investigating the demographics, risk factors, and prevention of suicide among the senior population in the area are scarce. Primary care doctors, specialized mental health support, gatekeeper training, means restriction, raising awareness, a supportive family environment, and a dedicated call center could be feasible strategies for preventing suicide among the elderly in the area. To develop successful suicide prevention techniques, additional research is required.

Data availability
No data are associated with this article.

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