

Strength and Vulnerability of Mental Illness in Older Persons within the Rural Context

Jessica Katerenchuk, RN, MN¹

Sherry Dahlke, PhD, RN, GNC(C)²

¹Research Assistant, Faculty of Nursing, University of Alberta, jkateren@ualberta.ca

²Associate Professor, Faculty of Nursing, University of Alberta, sherry.dahlke@ualberta.ca

Abstract

Purpose: In this paper we analyzed the complex issue of mental illness in older persons living in rural areas using the Strength and Vulnerability Integration (SAVI) model as a conceptual framework to bring balance to negative accounts of older persons' emotional experiences.

Method: A narrative review was conducted to examine the mental health issues of older persons living in rural areas. Three databases were searched for data pertaining to rural mental health and the SAVI model. Theoretical and empirical articles that analyzed the strengths and vulnerabilities in relation to mental illness in older persons living in rural areas were included and analyzed. Additionally, policy and position papers were used to interrogate this issue.

Findings: Analysis revealed three themes: individual vulnerabilities, system vulnerabilities and strengths. Rural individuals' struggles with chronic stress, a loss of social belonging, and neurological dysregulation across their lifespans were discussed in how they developed strengths in ageing and overcame vulnerabilities. Barriers to accessing mental health services, caregiving respite care, and health promotional services in rural areas included system vulnerabilities that exacerbated the rates of mental illness and poor health outcomes in older persons. Strengths included the rural social connection and community engagement that fostered a sense of community.

Conclusions: Research and practice recommendations situated within the SAVI model include the importance of acknowledging individual differences viewing the strengths of ageing, cultural

perceptions of time and leveraging community-based strengths to overcome vulnerabilities of ageing in rural areas. These changes will facilitate nurses and other health care providers assess, respond to, and prevent mental illness and poor health outcomes in the diverse ageing population living in rural areas.

Keywords: mental illness, rural areas, older persons, Strength and Vulnerability Integration model, ageing population

Strength and Vulnerability of Mental Illness in Older Persons within the Rural Context

Older persons' mental health is a major health concern and priority for governments and health care organizations globally (Canadian Mental Health Association, n.d.; World Health Organization [WHO], 2013, 2017). However, rural areas continue to face inequitable rates of mental illness and poor health outcomes in comparison to urban areas (Caxaj, 2016; Richman et al., 2019).

Background

The WHO's (2019a) Sustainable Development Target to prevent mental illness and promote wellbeing in older persons has public health importance (Rangarajan et al., 2021; Wainberg et al., 2017). One in four older persons currently lives with a mental health problem, a factor that decreases life satisfaction and increases rates of cognitive impairment, medical co-morbidity, and mortality (Pan American Health Organization, n.d.; Puvill et al., 2016; WHO, 2017). Unaddressed mental health concerns across demographics continue to cost the global economy over one trillion United States dollars per year when you account for one in five years lived with disability (Shim, 2020; WHO, 2019b). Societal repercussions are expected to worsen due to increasing numbers of older persons (Parker, 2015; WHO, 2017; WHO, 2022). Older persons will increase in numbers from 12 to 22 percent of the total population size (WHO, 2017). This means a greater number of older persons will experience mental illness and poor health outcomes, including suicide, in the

next decade (Canadian Coalition for Seniors' Mental Health, n.d.; Canadian Medical Association, 2016; Richter et al., 2019; Statistics Canada, n.d.-a).

Paying attention to mental health issues is important because more than 700, 000 people die every year from suicide globally (WHO, 2021). Older persons, particularly older men, currently experience the highest suicide rates of all age groups (Government of Canada, 2014; WHO, 2014). Rural residents face a doubled risk of dying by suicide compared to those in urban centres (Helbich et al., 2017; Statistics Canada, n.d.-b). This concern will continue to worsen unless a critical examination of the mental health issues and their contributing factors are identified and addressed (Moroz et al., 2020; St. John et al., 2021).

Although there are vulnerabilities in rural settings, there are also unique strengths. Moreover, older persons are very heterogenous and may have strengths as well as vulnerabilities in coping with mental health issues and maintaining their emotional wellbeing (Herron et al., 2021). To provide a holistic understanding of mental illness in rural areas, we employed the strength and vulnerability integration (SAVI) model as a conceptual framework (Nosraty et al., 2015), to examine how older persons in rural areas are managing mental health issues within various contexts including their families, communities, and health care systems.

The SAVI model is a multi-dimensional and lifespan-orientated ageing model that includes both assumptions of strengths inherent in aging, as well as vulnerabilities, providing a more balanced perspective. The SAVI model draws upon early psycho-social theories, primarily the Socioemotional Selectivity Theory (SST), to posit that individuals experience a motivational shift from knowledge acquisition to emotion-related goals as they age (Sullivan-Singh et al., 2015). This shift is related to the development of a limited time perspective, or the conscious or unconscious perception of time left to live (Carstensen et al., 1999; Liao & Carstensen, 2018). The

SAVI model extends the SST, suggesting that time lived also strengthens older persons' emotional regulation abilities as they develop life experiences and self-knowledge (Blanchard-Fields, 2007).

The SAVI model suggests that when older persons face sustained exposure to highly arousing or chronic stressors, age-related emotional strengths may disappear, and physiological vulnerabilities may arise (Charles, 2010; Sliwinski et al., 2021). Thus, older persons are at risk of developing physiological instability post-stressors related to age-related changes in their hemodynamic, parasympathetic/sympathetic, and cardio-musculature systems (Charles, 2010; Ferrari et al., 2003). Within the SAVI model are assumptions that older persons are prone to experiencing adverse outcomes following chronic stressors, such as high basal cortisol levels, increased blood pressure, and premature death (Buckley & Schatzberg, 2005; Ong et al., 2012).

Another assumption of the SAVI model is that older persons cope with stressors and maintain their emotional wellbeing by drawing on cognitive-behavioural emotional regulation skills, such as reappraisal of the situation, avoidance of negative circumstances, and reflection on more positive events (Mikels & Young, 2018). When older persons encounter circumstances where they are unable to draw on these strengths associated with ageing, they may experience a loss of social belonging, chronic uncontrollable stress, or neurological dysregulation, physiological vulnerabilities (Zacher & Rudolph, 2022).

We used the SAVI model as a conceptual framework to guide our examination of mental health in rural older persons as we believe it offers a balanced examination of vulnerabilities as well as strengths associated with ageing in rural areas. We acknowledge that the SAVI model has both strengths and limitations in this endeavour and will provide a critical discussion of the model's holistic strengths and limitations in our discussion of our findings.

Methods

The purpose of this narrative review was to explore the strengths and vulnerabilities of older persons as they navigate maintaining and improving their mental health, specifically in rural areas, using the SAVI model as a conceptual framework. The research questions that guided the review included:

1. What factors contribute to mental illness and poor health outcomes in older persons living in rural areas?
2. What strengths within rural communities promote mental wellbeing among older persons living in rural regions?

A search of three databases and policy/position papers related to mental health in older persons living in rural areas and the SAVI model was conducted. The inclusion criteria were empirical and theoretical articles that were: (a) focused on the emotional strengths and vulnerabilities of older adults living in rural areas in the global context, (b) accessible via the online library, (c) online articles published in full, and (d) in English. Rural areas were defined as all territory existing outside of urban centres, which included small towns, villages, and other populated places with less than 1,000 persons, agricultural lands, and remote/wilderness areas. The exclusion criteria included dissertations, theses, and articles written in languages other than English.

The search process involved a comprehensive computer-assisted search strategy across three databases: Medical Literature Online (MEDLINE), the Cumulative Index of Nursing and Allied Health Literature (CINAHL), and Psycinfo. In April 2022, the researchers consulted with a medical librarian to narrow down the terms for the search. The terms selected were: "mental* health*" or "mental* ill*" or "mental well*" or suicid* or depress* or anxiety or anxious* or "stress disorder*" or PTSD or "emotional well*" or "emotional health"; rural or countryside or "country

side" or non-urban or "remote* locat*" or "remote area*" or "remote* living"; elder* or "older people" or "older adult*" or "older individual*" or "older person*" or "old age*" or senior* or "older demographic*"; "strength* or vulnerab* or weakness* or advantage*".

Data Analysis

The methodological quality of the articles were assessed using the McGill Mixed Methods Appraisal Tool (MMAT) (Hong et al., n.d.; Pluye et al., 2011). Only papers that met 60% of the MMAT criteria were included. The first author completed data extraction of the articles by including the title/year, purpose, method, sample size, key findings related to the vulnerabilities and emotional-related strengths of older persons in the rural context, and outcomes. See table one. The second author guided the data extraction and participated in the analysis. The SAVI model guided our analysis of the data to ensure that we examined both the strengths of ageing, and the circumstances when older persons become vulnerable when unable to draw upon these advantages in the rural context.

Table 1*Overview of the Included Articles*

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Abdul Manaf et al. (2016). Malaysia	To determine the prevalence of mental health problems and their associated factors in a rural community of Perak, Malaysia.	Quantitative-Non Randomized; Cross Sectional Study	230 respondents of Malay elderly aged 60 years and older.	Mental health problems among the Malay elderly was identified as a concern. Malay elderly who were single (unmarried, divorced, widowed, living with family (i.e., unable to participate in social activities in the community), and having a poor general health status had a higher risk of depression.	Vulnerabilities related to mental wellbeing in older adults in the rural area of Perak were identified as being single, living directly with family, and poor general health status.
Adjaye-Gbewonyo et al. (2019). Africa	To determine associations between social capital and depression and assess differences between urban and rural settings.	Quantitative Non-Randomized; Cross Sectional Study	4209 Ghanaian and 3148 South African adults 50 years of age and older (suitable older adult age based on African countries' perceptions of ageing).	South African rural older adults appeared less engaged in community activities but more trusting and socially active informally than older urban residents. Community engagement, sociability, and trust were associated with risk of depression in rural Ghana.	Identified perceived support is more strongly associated with depression than received support, and therefore could be identified as a strength of ageing. Identified trust could be strengthened as a protective factor against depression in older adults. Was unable to determine meaningful urban rural differences in the effects of social capital on depression.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Baernholdt et al. (2012). United States	To examine QoL (QoL) in a nationally representative sample of community-dwelling adults 65 years and older according to geographic region. 3 dimensions of QoL were examined.	Quantitative Non-Randomized; Cross Sectional Study	5000 individuals from the civilian, non-institutionalized US population 60 years of age and older.	Older adults in rural regions experienced more vulnerabilities of ageing, including higher rates of chronic conditions, lower ADL function, lower social functioning, memory problems, and depression.	Lower rates on social functioning in rural areas indicate that rural individuals may be socially isolated, and that they need interventions to prevent chronic health conditions, strengthen relationships, and increase their QoL in older age.
Bayly et al. (2020). Canada	To investigate the support and education needs of people with dementia and their caregivers living in rural areas, the availability and use of support and education services, barriers to access and use of services, and solutions to overcome the identified barriers.	Scoping Review	174 articles (range of the age of subjects in the studies were not specified) were used for full text independent review.	Limited and insufficient services are available to dementia patients and their caregivers in rural areas. Specific gaps in care included day programming and respite care, counselling and support services, early stage support, and services for minority groups. Identified several barriers to the use of services including poor knowledge, practicality barriers, values, negative stigma related to dementia, and the inappropriateness of services.	A vulnerability of older adults in rural areas is the limited and insufficient services available to dementia persons and their caregivers. Also identified geographical and transportation barriers to accessing care as a unique barrier/vulnerability in rural populations. Highlighted the importance of informal community support networks in strengthening wellbeing in older age. Identified several recommendations to improve rural dementia services (reduce vulnerabilities) including, 1) enhancing the use of information and

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
					communication technologies, 2) having a point of entry to service use, 2) accessibility, d) interorganizational collaboration, 5) education, and 6) developing tailored/person centered services.
Behera et al. (2016). India	To estimate the prevalence of depression and to study the association of depression with sociodemographic and clinical variables among elderly persons in a rural community.	Quantitative Non-Randomized; Cross Sectional Study	490 identified elderly (aged 60 years and older) persons.	Older individuals living in rural regions are at an increased risk of depression. Living in a nuclear family, a lack of physical activity, presence of multiple chronic conditions, no role in family decision making, sleep problems in the past year, and bilateral hearing were loss associated with depression in elderly persons.	Identified that older persons living in the rural community should regularly engage in physical activity (walking), screening for chronic conditions, and in early public health interventions when diagnosed with depression to decrease risk of emotional deterioration.
Brjoux et al. (2016). Germany	To investigate whether volunteers with a special qualification for the assistance of families caring for dementia patients can support family members more effectively than conventional care options in rural areas.	Quantitative; Randomized Controlled Trial	76 families of dementia caregivers (age range of 52-78) were investigated.	Family support was identified to be an effective intervention for dementia affected families, leading to an improved QoL for caregivers. Easing the burden for family caregivers of persons with dementia in rural areas is necessary to maintain home care services.	To enhance the emotional strengths of ageing, programs and policies should strengthen social cohesion through older adults' community involvement, and parallelly, their QoL.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Burnette et al. (2021). China	To examine the impact of social cohesion and geographic locale (urban versus rural) on the QoL for older adults in China.	Quantitative Non-Randomized; Cross Sectional Study	9663 adults aged 50 years and older.	Social cohesion contributed to a better QoL in older persons. Cohesion mediated association of living arrangement (e.g., living alone, versus with family) and QoL in urban, but not rural areas.	Identified that programs that strengthen social cohesion through community involvement (fostering access, inclusion, meaningful participation) will enhance QoL and mental wellbeing (strengths of ageing) in both urban, and rural areas. Housing and community developments should focus on allowing older adults to live near, but not with adult children, particularly for rural adult women who are predominantly low income and low education.
Buvneshkumar et al. (2018). India	To estimate the prevalence of depression and to assess the factors that are associated with depression amongst the elderly.	Quantitative Non-Randomized; Cross Sectional Study	690 older adults (aged 60 years and older) in Kattankulathur, India.	Low socioeconomic status, a nuclear family, low intensity work, conflicts in the family, and death of family members were identified as associated with depression in older adults.	Identified that the risk for depression is closely tied with the family. Therefore, any changes in a family's equilibrium, including health, conflict, and bereavement must be acknowledged and addressed as they will have an impact on an older persons mental health status.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Carver et al. (2018). Canada	To examine what factors enhance or detract from the ability of older adults that live in rural areas to socially engage in rural communities.	Scoping Review	Included 19 articles in the scoping review. The age of “older adults” included in the review was not specified.	Maintenance of the physical home, assistance with pet care, and transportation to maintain social participation is key to increasing an older adults' ability to successfully age in place and maintain one's emotional wellbeing.	Highlighted that by providing community supports in doing daily tasks and having basic human contact, older adults can continuously contribute to the community, which creates a sense of belonging and social cohesion in rural areas.
Coleman et al. (2011). Bulgaria	To investigate the role of spirituality and religious practice in protecting against depression among older people in rural villages in Bulgaria and Romania.	Quantitative Non-Randomized; Cross Sectional Study	160 persons 60 years and older.	Eastern Europe displays high rates of depression among its older population. Religion is an important, but neglected part of social capital. Social support was also identified as correlated negatively with depressive symptoms.	Highlighted that enhancing older adult's sense of religion may offer protection against depression in older age in rural areas. Social support may also be used to enhance the emotional strengths of ageing and prevent vulnerabilities in older age.
Fastame et al. (2022). Italy	To investigate whether socio-cultural context (urban versus rural) perceived health, marital status, and satisfaction with family ties predicted hedonic and eudemonic wellbeing in late adulthood and to examine the impact	Quantitative Non-Randomized; Cross Sectional Study	101 community dwelling participants aged 68 to 94 enrolled in the Sardinian Blue Zone and in an urban area (Cagliari).	Main health services and a more favorable economic status was easier to access and obtain in urban centers by older adults. However, higher levels of wellbeing were identified among the inhabitants of Sardinian Blue Zone (rural area).	Interventions that promote maintenance of a positive social status and connection in older age (being useful for others, supported by others, respected) in one's community can be used to promote positive mental health outcomes in rural and urban areas.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
	of sociocultural context on wellbeing, physical health, and satisfaction with family.				
Garabrant & Liu, (2021). United States	To identify the degree of loneliness, depression, and activity engagement among rural homebound older adults and determine differences in loneliness and activity engagement between those with and without self-reported depression.	Quantitative Non-Randomized; Cross Sectional Study	350 homebound older adults (aged 60 years and older) in 2 rural counties in south central Indiana.	Depression was identified as associated with higher degrees of loneliness and low activity engagement in rural older adults. Identified that a high proportion of rural homebound older adults had depression. Older adults who were dependent on others and had difficulty competing ADLs were shown to experience higher degrees of loneliness (mobility issues may cause difficulty in leaving houses). Rural older adults who reported depression or loneliness engaged less in leisure activities.	Identified that rural homebound older adults with depression and loneliness must be encouraged to engage in meaningful activities and socially to strengthen their ability to emotionally cope in the community.
Gong et al. (2012). China	To investigate the associations between family characteristics and depressive symptoms and to provide recommendations for the prevention and treatment of depression of older adults.	Quantitative Non-Randomized; Cross Sectional Study	1317 individuals aged 60 years and older in rural China.	Confirmed that family related life events, family support, family economic status, and perceived physical health status are all independently associated with depressive symptoms. Identified a strong correlation between being exposed to harmful family environments and depressive symptoms in the rural elderly.	Efforts must be made to address family risk factors (negative life events such as the loss of a spouse, bad perceived health statuses) and enhance family cohesiveness to decrease depressive symptoms in older adults.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Hagen et al. (2022). Canada	To explore perceptions of help seeking for mental health among farmers and people who work with farmers.	Mixed Methods; Sequential Mixed-Methods Design	75 farmers (average age 46.6, range 19-88) in Ontario.	Identified several themes in their analysis, including 1) the negative impact of financial stress on perceived stress on farmers. Identified relationships between gender and perceived stress (increased in females due to multiple roles), 3) perceived industry peer support and perceived stress (require community support), and 4) perceived stress and perceived support from family (farmers require support from family to manage stress).	Identified a need to provide stress management and resilience building approaches and interventions for farmers, that include social support networks, industry support (i.e., particularly for women).
Hagen et al. (2021). Canada	To identify and explore factors associated with perceived stress among Canadian farmers.	Qualitative; Descriptive	75 farmers (average age 46.6, range 19-88) in Ontario were interviewed.	Help-seeking among farmers were identified as dependent on four factors in five themes including 1) the accessibility for farmers (i.e., based on awareness, 2) physical distance, finances, and gender), 3) stigma surrounding mental health and help-seeking, 4) the anonymity of services, and the 5) farm credibility of services and service providers.	Identified that all barriers (financial supports, physical accessibility, stigma, anonymity, gender specific services) to mental health in rural areas in farmers must be addressed through taking a farm credible approach, and understanding the lifestyle and needs of rural farming individuals.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Herron et al. (2021). Canada	To investigate perceptions of isolation and loneliness during the initial states of the pandemic (May to July 2020).	Qualitative; Descriptive	26 community dwelling older adults (65 years of age and over) living in rural Manitoba.	Rural dwelling older adults are a diverse group with different resources influencing their pandemic experience. During the pandemic older adults experienced isolation and loneliness related to 1) a loss of feelings of autonomy, 2) loss of social activities and spaces, and 3) lack of meaningful connection at home (loss of spouses, friends). However, the authors also found that rural 4) older adults had experienced past feelings of isolation living in rural areas related to the tight knit community and lack of services/activities for older adults. Therefore, many older adults also had developed strategies to manage isolation, such as 5) adapting one's home environment and 6) negotiating physically distanced visits (meeting outside and connecting via online technology), and keeping busy.	Identified the need to develop 'place based' social resources in rural areas for older adults to protect against isolation and loneliness, building upon the strategies used by older adults in managing isolation pre-pandemic. Identified the importance of developing remotely delivering social programs, telephone support services, physically distanced outdoor visits, and programs that encourage keeping busy (walking, gardening) to assist older adults in strengthening their emotional wellbeing.
House of Commons. (2019). Canada	To identify factors that make farmers vulnerable to mental health problems and to look at initiatives across Canada that supports farmers	Policy Paper	Reports from farmers (aged 18 and over) across Canada.	Rural farmers experience a high prevalence of mental distress. Factors identified that contributed to an increased risk of mental illness in farmers were uncertainty and limited control, the isolation and stigmatization of farming, and	Identified the importance of developing a national coordination of existing initiatives to support farmers' mental health (Canadian Network for Farmer Mental Health). This would involve

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
	facing mental health challenges.			the high-risk nature of farming. Factors that contributed to barriers in accessing current supports for farmers were the lack of a clear mental health mandate for agriculture, the restricted access to mental health care, and that health care providers had a poor understanding of the needs of farmers.	developing tailored easy access, online programs strengthening mental health and resilience in farmers, training and awareness efforts for stakeholders involved with farmers (highlighting the value and importance of farming), and providing adequate economic support to the agriculture sector.
Howorth et al. (2019). Africa	To investigate community beliefs surrounding depression in sub-Saharan Africa.	Qualitative; Descriptive	81 participants from rural villages of Kilimanjaro, Tanzania (60 years of age and older).	Identified that depression in older people could be described as having "too many thoughts," cognitive symptoms, affective and biological symptoms, a wish to die, and somatic symptoms. Identified depression as potentially caused by an inability to work, loss of physical activity and independence (unable to be financially productive), lack of resources, chronic disease, and family difficulties in older adults living in rural areas in Tanzania. Cognitive impairment was identified as commonly associated with depression in older people. Identified that depression was managed through love and comfort,	Identified that attempts to understand culturally specific concepts of depression may assist us in accurately diagnosing mental illness, improving service use and availability, and reducing stigma surrounding mental illness in older adults.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
				providing advice, help, and spiritual comfort.	
Hu et al. (2018). China	To investigate the extent to which social supports could explain depression symptom disparity between rural and urban older adults living in China.	Quantitative Non-Randomized; Cross Sectional Study	Data from 6772 observations (aged 45 and older) from the 2011 China Health and Retirement Longitudinal Study.	Identified rural older adults experienced more depressive symptoms than their urban counterparts. Identified that the gap in community support for older adults in rural areas was a prime explanation for depressive symptom disparities between urban and rural older adults living in China. The urban-rural difference in family support also contributed to this disparity. Identified that educational level and increased levels of chronic health conditions (decreased physical health status) could contribute to the revealed disparity in depressive symptoms.	To decrease the depression rates in rural older adults, social supports should be strengthened (i.e., improving infrastructure construction, strengthen role of social organizations), and community interpersonal interactions should be encouraged. Identified that mental health supports must particularly be given to rural older adults with low education level (i.e., to improve their ability to emotionally cope).
Jones-Bitton et al. (2020). Canada	To examine the prevalence of stress, anxiety, depression, and resilience amongst Canadian farmers.	Quantitative Non-Randomized; Cross Sectional Study	1132 farmers (average age 46.6, less than the average age of Canadian farmers age 55) participated in the study.	Identified that the scores of stress, anxiety, and depression were higher and the scores of resilience lower in farmers than normative data. Females in particular scored less positively on all mental health outcomes investigated. Strategies such as talking with peers (social support), engaging in hobbies, and performing self-care were identified as useful in improving resilience (essential in	Highlighted mental illness in farmers as a significant public health concern in Canada. Identified a critical need for research and interventions (policy, mental health training, health service) related to strengthening farms' mental health and resilience.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
				safeguarding against the negative impacts of stress in farming).	
Kunde et al. (2018). Australia	To examine the life and death circumstances of Australian male farmers who died by suicide through verbal reports from their significant others.	Qualitative; Ethnography	12 male farmers (average age 60.17) that committed suicide (family members completed the interviewing, average age 63.50).	6 themes were identified that contribute to elevated rates of suicide in farmers including 1) masculinity as a norm, 2) uncertainty and feelings of no control in farming, 3) feelings of failure in farming, 4) escalating health problems (physical and mental), and 5) maladaptive coping mechanisms (drinking, aggressive behaviors, and 6) increased means (firearms).	Farmers will continue to face uncertainty (weather, negative life events) in their occupation; local service networks must improve access to mental health care and suicide prevention strategies (strengthening farmers' social support networks, coping mechanisms). In these programs, several factors that contribute to mental illness in farmers must be addressed including masculine norms and socialization, expectations of self in maintaining family traditions and occupation, and a male subtype of depression (i.e., aggressive, anxiety driven).
Li et al. (2022). China	To examine the mediating role of sleep quality and psychological distress between the already explored relationship between social	Quantitative Non-Randomized; Cross Sectional Study	2254 rural empty nest older adults (aged 60 years and older) were included in the analysis.	Identified that sleep quality and psychological distress mediated the relationship between social capital and self-rated health in older adults in rural areas.	Efforts must be made to improve older persons' mental health through increasing access to social support resources in rural areas. Mental health support options (increase the strengths of

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
	capital and self-rated health.				ageing) must specifically be made for older adults living alone with sleep problems and psychological distress.
Liang et al. (2020). China	To investigate the relationships between social capital and individual health among the elderly in rural China in an effort to improve the health of Chinese people.	Quantitative Non-Randomized; Cross Sectional Study	Selected 3719 respondents (aged 60 years and older) from the 2016 China Family Panel studies.	Identified that cognitive social capital (perceptions of accessible social networks) plays a stronger role than structural (actual social activities in formal or informal networks) in promoting individuals' health (including emotional wellbeing) among the elderly. Identified that the health status of older adults in rural areas is poor, related to poor health knowledge among older adults in healthy eating and hygiene habits.	Increased access to primary health care resources must be created in rural areas to decrease chronic health issues in older adults living in rural areas. These resources must be adaptable, as older adults in rural areas are heterogeneous and require different supports (social capital via social groups, mental health needs, chronic health needs).
Lin & Chen. (2018). China	To examine the connections between intergenerational emotional closeness, location of multiple children, and parental depressive symptoms within a context of out migration in rural China.	Quantitative Non-Randomized; Cross Sectional Study	Sample of older adults aged 60 living in rural townships in Chaohu (agricultural municipal district with massive out-migration).	Identified that individuals with adult children living in urban areas were not necessarily the most at risk for deterioration in emotional wellbeing. Individuals with adult children living closely by could also experience deterioration in psychological wellbeing if the bond is weak. However, identified that collective emotional closeness (social cohesion) and psychological wellbeing is positively	Intergenerational cohesion and the physical location of children from older adults affects parents' psychological wellbeing in later life. Efforts must therefore be made to strengthen social cohesion between families to support older adults' emotional wellbeing in later life.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
				associated with each other in older adults.	
Luo et al. (2017). China	To examine the association between social activities and depressive symptoms among older adults in China regarding urban-rural differences.	Quantitative Non-Randomized; Cross Sectional Study	8255 respondents (aged 60 years and older) from 2015 China Health Retirement Longitudinal study.	Identified the prevalence of depressive symptoms was lower in urban older adults compared with rural older adults. Identified interacting with friends daily or in hobby groups were inversely associated with depressive symptoms among rural older adults. However, rural older adults had a higher prevalence of depressive symptoms and participated in fewer social activities compared to their urban counterparts.	Identified related to the high prevalence of depressive symptoms and low social activity participation in rural areas, financial and social supports must be created for older adults.
Moholt et al. (2018). Norway	To explore the use and predictors of home based and out of home respite care services available to home dwelling persons with dementia through examining the perspectives of family caregivers.	Quantitative Non-Randomized; Cross Sectional Study	Included 420 family caregivers (aged 65 years and older) in northern Norway.	Identified that home care services were significantly higher for persons with advanced age, those living in urban areas, persons living in an assisted living facility, persons living alone, and those able to manage being alone for a short period of time. Use of out of home respite care services was higher among male persons with dementia and those living in urban areas. Higher age, educational level, status as a daughter/son, full time employment predicted greater use of home based services.	Identified that more efforts must be made to support families who underuse respite/homecare services (older adults in rural areas, with low educational levels) when caring for family members affected by cognitive disability at home. To promote equity, these services must be tailored to all families and groups of persons with dementia and their caregivers (via social

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
					supports, emotional supports).
Nair et al. (2015). India	To examine the psychiatric problems faced by the elderly Indian population and develop strategies to improve their QoL.	Quantitative Non-Randomized; Cross Sectional Study	383 elderly patients (aged 60 years and older) were included.	Identified that over 33.9% of the geriatric population in India was above the threshold for mental illness. The most common psychiatric disorder in older adults in rural areas was depression. Highlighted that several barriers prevented the use of health facilities by the community, with more faced by the elderly. These included limited mobility, limited information access, inadequate awareness of the treatability of mental conditions, lack of family support, and social isolation.	Identified efforts must be made to raise awareness of mental disorders and its association with older age to enhance early detection and treatment in rural areas. Efforts must also be made to address family and social risk factors for mental illness among older persons living in rural communities (increased social supports, suicide prevention information, family support).
Neville et al. (2018). New Zealand	To understand the physical and social factors that enable those aged 85 years and over to remain engaged in a rural community.	Qualitative; Descriptive	Included 15 people (aged 65 years and older) who lived independently	Identified that older people aged 85 years and over found challenges in negotiating the physical environment and maintaining social networks due to changing social demographics and the availability of community	Identified efforts must be made to develop the physical environments in rural areas (age friendly communities) to support older adults in navigating

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
			in a rural community.	groups. The first theme (negotiating physical environment) identified well designed physical environments could assist older adults in engaging in social/community activities. Identified not all individuals had access to a car and public transport operations were minimal (decreasing access to social engaged. The second theme (maintaining social networks) identified the importance of social environments for older persons in maintaining emotional wellbeing.	their communities and engaging socially.
Pérès et al. (2012). France	To study health and aging in elderly farmers living in the rural area, with a central focus on dementia.	Quantitative Non-Randomized; Cross Sectional Study	1002 participants (aged 65 years and older) randomly selected from the Farmer Health Insurance rolls.	The ageing population and growing burden of chronic disease will increase demand for health and social services for older farmers with dementia. Elderly farmers living in the rural area experience increased risk of dementia related to the long term effects of agricultural exposures. However, these work related vulnerabilities were balanced by the advantages of living in rural areas (walking, fishing, gardening, hunting, etc.).	An aging populations and increasing burden of chronic diseases in older age will increase the demand for health and social services for older adults. In rural areas, the challenges of agricultural exposures and decreased access to shops, services, and primary care is outweighed by the advantages (protective factors) of the richer social support networks, living environment (greenery, security, spacious

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
					accommodations), and access to a healthier lifestyle.
Roy et al. (2017). Canada	To understand the social contexts in which farmers engage in health promoting behaviors that may prevent or mitigate mental health problems.	Qualitative; Descriptive	32 farmers (age range of 25 to 64) in Quebec.	Identified that positive coping mechanisms used by farmers did not align with the negative aspects of the traditional hegemonic norms in North America, and that health promotion strategies should be aligned with the positive, more progressive aspects of these norms (e.g., promoting work life balance). Coping mechanisms used by farmers currently focus on instrumental action (taking breaks), rather than communicative action (talk) for farmers when dealing with emotional issues. Many older adults and younger farmers are questioning the relentless work ethic previously dominant in farming, representing a cultural change across and within age groups.	Services must be developed that support farmers in managing their mental health problems. This can be achieved through developing services that enhance farmers' resilience and community engagement (taking breaks collectively), and further deconstruct masculine practices that inhibit engaging in mental health supports.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Ruan et al. (2022). China	To examine the association between negative life events and depressive symptoms for older adults, and to differentiate the moderating roles of family ties and friendship ties in the perceived association.	Quantitative Non-Randomized; Cross Sectional Study	Data from 11,471 older adults (aged 60 years and over) in the Chinese Longitudinal Aging Social survey.	Exposure to negative life events is an important risk factor for depression in older adults. Older adults with stronger social ties display less severe depressive symptoms than those with weaker social ties when experiencing negative life events (evidence of the moderating role of social ties). Both family and friendship ties were directly related to less severe depressive symptoms (friendship ties were stronger).	As older adults faced an increased risk of disruptive life events at older age, they are more at risk of depression. Therefore, efforts must be made to support older adults in enhancing cohesion among their family network to improve their mental wellbeing (living close, co-residing). Also emphasized the importance of developing friendships in older age to enhance their psychological wellbeing through enhancing resilience and positive coping mechanisms.
Saifullah et al. (2020). Indonesia	To identify the population's mental health status and factors correlated with mental distress in rural areas of Indonesia.	Quantitative Non-Randomized; Cross Sectional Study	1500 residents (aged 75 years and older) from villages in Yogyakarta, Indonesia.	The rural population of Indonesia has a higher prevalence of mental distress in comparison to those living in urban areas. Sociodemographic status (older age), gender (male), occupation, small size housing, and being chronically ill (2.6 times risk of mental distress) were found to be correlated factors of mental distress in rural Indonesia.	Identified the importance of developing mental distress prevention programs adapted to older adults, those with more chronic conditions, gender, low income, housing situation (enhancing intergenerational support) and occupation (related to psychological and social work demands).

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Scorgin et al. (2016). United States	To investigate two contrasting explanations (behavioral versus cognitive) in the relation of emotional distress to QoL. Or, the mediating role of engagement in pleasant events (behavioral theory) and hopelessness (cognitive) in the relation of emotional distress and QoL.	Quantitative Non-Randomized; Cross Sectional Study	134 older adults (aged 65 years and older) with reduced QoL and increased psychological symptoms in rural areas.	Both theoretical approaches of the Cognitive Behavioral model and Theory of Emotional distress (combines cognitive approaches with behavioral elements) are important to understanding QoL in older adults living in rural areas. The impact of emotional distress on QoL in older rural adults is mediated by the feelings of hopelessness and the impact of these feelings on the pursuit of pleasant events. Race/ethnicity (Caucasian versus African Americans) moderated the indirect effect of emotional distress through engagement in pleasant events and feelings of hopelessness.	Feelings of hopelessness and engagement in pleasant events is useful targets for interventions in rural, older adult populations. Interventions aimed at reducing hopeless and increasing pleasant events may assist in increasing older adults' QoL. Strategies that should be implemented in older adults that enhance QoL included cognitive behavioral therapy (reframing negative thoughts) and behavioral activation (enhancing problem solving, communication skills).
Silverstein & Zuo. (2021). China	To examine the impact of caregiving for grandchildren on grandparents' mental health.	Quantitative Non-Randomized; Cross Sectional Study	Constructed 2835 observations (aged 45 years and older) from 1067 grandparents.	When older adults experience limited socioeconomic support from adult children, they are more likely to experience mental distress. However, level of engagement with families and other social group is beneficial to cognitive ability, not emotional wellbeing.	As economic inequality grows in China and family size continues to decrease, adult children are increasingly unable to provide economic support to parents who are taking care of left behind children. The economic and therefore emotional wellbeing of caregiving parents can be enhanced through

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
					strengthening pension programs.
Silverstein et al. (2020). China	To investigate how uncertainty about care may adversely influence mental health in the older adult population in Canada by applying social support and control theories.	Quantitative Non-Randomized; Cross Sectional Study	Based on data from the China Health and Retirement Longitudinal Study (multipanel national representative household survey of the Chinese population aged 45 years and older). 11, 000 to 14, 000 respondents were used for the final regression panel.	Identified older adults living in urban areas and with a college education is less likely to expect care and experienced less depression compared to rural older adults and less educated adults. Caregiving frequency is not by itself harmful or beneficial to the emotional and cognitive health of older adults in rural China. However, caregiving in older age could be harmful in the context of custodial care that is less economically supported by adult children. Identified that elevated emotional distress is common among older adults that have uncertainty about having a future care provider (absence of children, living further away from them). Also identified that decreased living standards and ADLs increase depression in older adults.	The rapid ageing of the China population, increases in chronic disease burden, and decreases in family caregiving indicates that older adults in China may face health and social conditions that will deteriorate their mental health (e.g., uncertainty about having a future care provider, financial security, etc.). Efforts must be made to financially incentivize adult children in caregiving for older adults, develop community based care for older adults, and low cost housing for older adults without family support. Also identified the importance of developing mental health supports for older adults with chronic health conditions and limited family support.
Sun et al. (2017). China	To examine the predictive power of	Quantitative Non-	Data were drawn from a	Low self-esteem (from low social supports), severe	Identified that strengthening family

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
	depression on QoL after controlling for self esteem.	Randomized; Cross Sectional Study	study of elderly's mental health in rural China. Survey used a sample from 5 public nursing homes in Xintai county (205 individuals aged 60 years and older).	depressive symptoms, and insufficient social support could decrease seniors' QoL (mental wellbeing). Identified that QoL was negatively associated with age and positively affected by visiting frequencies from their relatives, and that widowed/divorced people reported poorer QoL than the married. Social support moderated the relationship between self-esteem and QoL. Older adults in nursing homes experienced severe mental health problems and the low self-esteem made them reluctant to ask for help. Social support also buffered the effect of depression on QoL among older people in Chinese rural care homes.	(family eased psychological distress) and other social supports could help older adults with low self-esteem improve their QoL, particularly in care homes. Efforts should also be made to increase the self-esteem of older adults to enhance their QoL and serve as a buffer against depression.
Thapa et al. (2018). Australia	To examine the association between the left behind or empty nest status and the mental health of older adults. Also, to identify risk factors for mental health in older adults living in rural areas.	Integrative Review	25 articles met the inclusion criteria to be reviewed. The age of subjects in the studies ranged from 50-100 plus years.	"Left behind" older adults had higher levels of mental health problems. They experienced higher depressive symptoms, higher levels of loneliness, lower life satisfaction, cognitive ability, and psychological health. Risk factors for mental health disorders in the left behind parents included living arrangements, gender, education, income, physical health status, physical activity,	Efforts must be made to target social security supports for the older adults left behind, improving their mental health and wellbeing. Also identified the importance of developing programs that enhance emotional intimacy (via technology) between older parents and their migrant children, to

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
				family and social support, age, rural residence, and frequency of children's visits.	reduce risk of mental illness in older adults. Identified special attention must be made to support older adults who are unmarried, have lower education, poorer economic background, older, living in rural areas, and with chronic disease in feeling socially connected (via social support programs, physical activities).
Wang et al. (2001). Taiwan	To examine the stressors, stress levels, loneliness, and depression experienced by Taiwanese rural elders to determine if differences in their levels of stress were associated with person-environmental characteristics.	Quantitative Non-Randomized; Cross Sectional Study	201 older adults rural community members (aged 65 years and older).	Rural elders experienced a number of different stressors (i.e., physical strength, pain, and discomfort were the most common). Few respondents reported high levels of loneliness. Rural individuals in Taiwan are more interconnected with their neighbors than in the United States (US), and this may account for the decreased rates of mental illness compared to the US. Differences in the degree of stressfulness were related to factors of gender, educational level, living arrangement, and socioeconomic status.	Identified training needs to be created for community health practitioners to recognize changes associated with ageing (loss, family dynamics, social isolation rural areas, and mental health problems). Identified also a need for specialized mental health services in rural Taiwan, and that mental health care should be provided in addition to routine physical health care to rural elders.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Williams et al. (2016). Canada	To understand how does social location influence the experience of family caregivers of older adults with multiple chronic conditions.	Qualitative; Constructivist Grounded Theory	Included 40 participants from two provinces. The informal caregivers interviewed were aged 18 years and over and the “older adults” were aged 65 years and older.	Challenges experienced by caregivers for those with multiple chronic conditions were identified in four themes including 1) the caregiving trajectory that contained the three phases of a) initial (challenges managing time, b) middle (adjusting to changes), c) large (growing confidence), 2) balancing work, caregiving, and family, 3) caregiving and health (maintaining one's physical wellbeing), and 4) finding meaning/self in caregivers (developing gratitude, compassion).	Gender (female), age (older), employment status (part-time), ethnicity (i.e., immigrants were more vulnerable to a loss of social connection), and geographic status (rural areas) negatively affected the wellbeing of caregivers of older adults with multiple chronic conditions and must be supported when developing mental health programs.
Windley & Scheidt. (1983). United States	To examine the similarities and differences in service use and frequency of activity participation in the physically and mentally well or at risk older persons in rural areas.	Quantitative Non Randomized; Cross Sectional	989 older adults (specific age was not specified) were selected from 39 counties in the United States.	Mental health service use was decreased in the rural areas for both well and vulnerable groups (related to decreased access to public transportation). Mentally vulnerable individuals were less likely to access basic community resources (e.g., church, volunteer work, restaurants) related to a lack of functional capabilities or they had no one to assist them. Use of community services is a necessary part of independent living, and informal helping networks in small towns assist older adults in obtaining these services.	Tailored services must be created to support older adults in rural areas engage socially. Groups including "helping networks" could be expanded and coordinated to assist older adults transport within the communities. Other services such as homemaking, nutrition sites, senior centers, and shuttle services must also be coordinated and offer services to older adults living at home.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Yang et al. (2021). China	To examine use of community services by the elderly and its association with mental health (comparing gender and mental health differences).	Quantitative Non-Randomized; Cross Sectional Study	687 elderly people (aged 60 years and older) from 7 counties of China were enrolled.	Medical services utilization by older adults were higher in rural than in urban areas. Due to a deficiency of large hospitals and restricted transportation, rural residents had fewer chances to access professional medical resources in bigger medical situations. Rural residents experienced slightly worse mental health than urban older individuals. Older adults also used social and recreational services more than in urban areas (i.e., rural areas have less entertainment methods), and may access day care services more frequently than urban older people.	Multigenerational cohabitation must be encouraged to enhance children's sense of family responsibility and to provide support for older adults. Efforts must also be made to enhance daily care, social, and recreational services in both urban and rural areas. Medical care and spiritual comfort services must be strengthened to support the wellbeing of community dwelling older persons.
Yazd et al. (2019). Australia	To identify the potential risk factors affecting farmers' mental health globally.	Systematic Review	167 articles on farmers' (aged 18 plus) mental health.	Elevated risk of mental disorders in farming populations were related to pesticides exposure, financial problems, unpredictable climate, and past injuries. Additional factors were machine breakdowns, hearing loud machines, time pressure, and governmental regulations. These stressful factors resulted in low self-esteem, withdrawal from social activities, relationship breakdown, hopelessness, nervousness, fatigue, and other mental health	Identified farmers' mental health issues were the result of a complex interplay of social, environmental, and economic factors. Social, environmental, financial, and future health policies must be developed to address these risk factors.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
				concerns in farmers living in rural areas.	
Yiengprugsawan et al. (2012). Australia	To examine the characteristics of Thai caregivers, the distribution of psychological distress and mental distress among caregivers, and the association between caregiver status and psychological distress.	Quantitative Non-Randomized; Cross Sectional Study	60, 569 Thai adult (majority older adults, aged 40 years and older) part time and full time caregivers.	Early identification of vulnerable caregivers is needed to promote wellbeing. Full time caregivers (mostly older adults living in rural areas) were more distressed than non-caregivers. A lack of social contacts (colleagues and friends) contributed to psychological distress among caregivers. Also identified women were often assumed to be natural caregivers, but did not find caregiving as rewarding as male caregivers. Identified an association between advancing age and lower psychological distress.	Identified that social supports must be supported for caregivers and care recipients in older age. Social support services could also be used to provide respite care, and therefore enable the caring role to be sustained over time in older adults.

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
Zhang & Silverstein (2022). China	To examine whether loneliness mediated the relationship between intergenerational emotional cohesion (IEC) to psychological wellbeing (PW) and whether friendship ties moderated the strength of the direct and indirect relationships between EEC and PW.	Quantitative Non-Randomized; Cross Sectional Study	958 individuals aged 60 years and older from the Longitudinal Study of Older Adults in Anhui Province, China.	Stronger intergenerational cohesion (with children) was related to reduced depressive symptoms and increased life satisfaction directly and indirectly through reducing feelings of loneliness. Intergenerational emotional cohesion and friendship ties were identified as mutually reinforcing with respect to depressive symptoms.	Identified that efforts should be made to strengthen social relations to improve mental wellbeing in older adults in rural China. These programs could be centered in senior centers that provide structured activities for older adults in service deprived rural areas. Identified that these changes may produce wide gains for QoL in vulnerable populations experiencing social and family changes.
Zhang, Nazroo, & Vanhoutte (2021). China	To examine how migration into urban areas in China is related to risk of depression in later life related to the timing and type of migration.	Quantitative Non Randomized; Cross Sectional Study	17, 000 Chinese residents aged 60 and older from 10, 000 households within 28 provinces.	Lifelong urban residents had a higher mental health status compared to lifelong rural residents. The mental health advantage of urban residents is explained by a combination of socioeconomic advantage, access to state welfare, and informal social support (from family without co-habituating). Also, rural to urban migration at older ages is more beneficial for later life wellbeing than migration earlier in life.	Intergenerational cohesion does not always enhance the wellbeing of older adults when they are financially secure and independent. Therefore, efforts should be made to enhance the ability of older adults in living an independent life in close proximity to their children (through formal social protections in adequate pensions).
Zhang, Wang, & Xu (2021). China	To identify and examine the social determinants	Quantitative Non-Randomized;	3438 elderly individuals (aged 60 years	Identified a high prevalence of depressive symptoms amongst the elderly in rural areas.	As socially disadvantaged individuals in older age are more

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
	contributing to the degree of depressive symptoms in the Chinese elderly with chronic conditions.	Cross Sectional Study	and older) from the China Health and Retirement Longitudinal study.	Identified that depressive symptoms were more frequently identified in socially disadvantaged populations, and that social/family support and economic support were ideal for reducing the degree of depressive symptoms in this population.	vulnerable to depressive symptoms, psychological supports and interventions should support older adults in coping and managing their mental wellbeing.
Zhou et al. (2019). China	To examine the relationship of socio-demographic characteristics including being left behind, mental disorder, depressive symptoms, stressful life events, social support, and completed suicide.	Quantitative Non Randomized; Cross Sectional Study	A total of 242 suicide victims (aged 60 years and older) and 242 living comparisons were enrolled in the study. Interviews were conducted with informants of suicide victims and their living comparisons.	Unstable marital status, the unemployed, those with depressive symptoms, and mental disorders were independent risk factors for suicide in the rural elderly. Being 'left behind' by family can elevate their suicide risk through increasing life stresses, depressive symptoms, mental disorder, and decreasing social support options.	Identified that health care professionals can buffer the negative impact of being left behind in older age through providing social support, enhancing social connections, and treating/help manage mental conditions and life stresses.
Zhou et al. (2021). China	To investigate the mental health status in the older adult Chinese population during COVID-19 and to determine influencing factors of psychological symptoms.	Quantitative Non-Randomized; Cross Sectional Study (Longitudinal)	Online survey to 1501 participants (aged 60 years and older) from 31 provinces in China.	Health related factors (i.e., having two or more chronic conditions) had the greatest influence on mental status in older age. Higher education level, better economic conditions, and having social support were identified as factors that lowered risk of mental illness in older age. Rural residence and those that	Highlighted that suicide in older adults could be prevented through reducing pesticide use (decreasing environmentally related health conditions), and enhancing training for rural physicians in treating mental health disorder in older adults,

Authors/Location	Purpose	Method	Sample	Findings	Outcomes
				lived in medium risk or lockdown regions experienced more depressive symptoms.	mitigating stresses in older adults, and enhancing social connections (particularly among "left behind older adults").

Note. A summary of the purpose statements, samples, findings, and outcomes of the 48 included articles.

Results

Analysis revealed three themes *individual vulnerabilities, system vulnerabilities and strengths*.

Individual Vulnerabilities

Three types of vulnerabilities of older persons living in rural areas included *chronic stress, a loss of social belonging, and neurological dysregulation*.

Chronic Stress

Sources of chronic stressors included a loss of cohesion in social networks, the death of family members, maintaining financial security, and managing pain/chronic health conditions (Behera et al., 2016; Gong et al., 2012; Howorth et al., 2019; Saifullah et al., 2020; Scogin et al., 2016; Silverstein et al., 2020; Wang et al., 2001; Williams et al., 2016; Zhang, Nazroo, & Vanhoutte, 2021; Zhang, Wang, & Xu 2021; Zhang & Silverstein, 2022; Zhou et al., 2019; Zhou et al., 2021). Workers in agriculture, a large industry consisting of primarily older persons, encounter multi-dimensional and pervasive stressors daily (House of Commons, 2019; Jones-Bitton et al., 2020; Lin & Chen, 2018; Roy et al., 2017; Wang et al., 2001; Yazd et al., 2019). These older farmers experienced ‘chronic’ stress and became unable to draw upon the emotional regulation strengths associated with ageing, resulting in high levels of emotional reactivity and poor health outcomes, including suicide (Buvneshkumar et al., 2018; Charles, 2010; Hagen et al., 2021b; Kunde et al., 2018; Piazza et al., 2015). See table two for how descriptions of the chronic stress of farmers living in rural areas are similar to the SAVI model’s definitions of chronic stress (House of Commons, 2019; Scott et al., 2013).

Table 2

Experiences of Chronic Stress in Farmers

SAVI Model's Definition of Chronic Stress (Scott et al., 2013)	Experiences of Rural Residents
No means of escape.	Individuals are unable to escape from their work-related stress: "I can't tell farmers to return home to rest. Farmers are home, and that place is the source of their stress" (House of Commons, 2019, p. 24).
Distressing and pervasive.	Farmers, ranchers and producers come under attack from many different sources: "Our ancestors only had to worry about weather and prices. Today we farmers have the added worry of being a target of an extreme activist, something that takes a serious toll on me mentally" (House of Commons, 2019, p. 57).
Prolonged circumstances.	Farming is a high-risk industry filled with volatility and uncertainty: "Canadian farmers have endured drought, porcine epidemic diarrhea, and... financial impacts" (House of Commons, 2019, p. 57).

Loss of Social Belonging

The SAVI model acknowledges the importance of social network's protective effects against chronic stressors in older age (Sun et al., 2017). Rural dwelling persons value social participation and develop larger social networks compared to individuals living in urban areas (Carver et al., 2018; Neville et al., 2018; Wang et al., 2001; Yang et al., 2021). Yet, they also experience logistical barriers to social connections due to low broadband internet, transportation barriers, and diminished education opportunities (Abdul Manaf et al., 2016; Burnette et al., 2021; Carver et al., 2018; Hu et al., 2018; Liang et al., 2020; Lin & Chen, 2018; Slwinski et al., 2021; Zhang, Wang, & Xu, 2021; Zhou et al., 2021). These challenges to accessing social connection with community and religious organizations can lead to psychological distress and loneliness, and a risk of mental illness (Adjaye-Gbewonyo et al., 2019; Coleman et al., 2011; Fastame et al., 2022; Garabrant & Liu, 2021; Heron et al., 2021; Hu et al., 2018; Li et al., 2022; Luo et al., 2017; Ruan et al., 2022;

Saifullah et al., 2020; Scott et al., 2013; Wang et al., 2001; Windley & Scheidt; 1983; Yiengprugsawan et al., 2012; Zhou et al., 2021).

A loss of family cohesion (i.e., with partners, children, grandchildren, friends, etc.) in the rural areas can contribute to diminished emotional wellbeing (Buvneshkumar et al., 2018; Fastame et al., 2022; Gong et al., 2012; Hogworth et al., 2019; Lin & Chen, 2018; Li et al., 2022; Nair et al., 2015; Ruan et al., 2022; Scorgin et al., 2016; Thapa et al., 2018; Zhang, Wang, & Xu, 2021; Zhang & Silverstein, 2022). Younger generations often move to urban centres (Burnette et al., 2021; Li et al., 2022; Zhang, Nazroo, & Vanhoutte, 2021; Zhou et al., 2019) contributing to older persons' perceptions of being 'left behind' (Burnette et al., 2021; Lin & Chen, 2018; Zhang, Nazroo, & Vanhoutte, 2021; Zhou et al., 2019). To combat these feelings older persons could focus on nurturing their social support system and trusting others outside of the family (Burnette et al., 2021; Liang et al., 2020; Lin & Chen, 2018). Social supports nurture feelings of support, trust, and respect and can protect older adults who are living alone from emotional deterioration and poor health outcomes (Adjaye-Gbewonyo et al., 2019; Burnette et al., 2021; Sun et al., 2017).

Neurological Dysregulation

Age-related chronic conditions that cause neurological dysregulation, such as dementia are disproportionately represented as older persons frequently retire into a rural setting (Baernholdt et al., 2012; Behera et al., 2016; Channer et al., 2020; Holecki et al., 2020; Howorth et al., 2019; Lin & Chen, 2018; Nair et al., 2015; Neville et al., 2018; Pérès et al., 2012; Silverstein et al., 2020; Thapa et al., 2018; Yang et al., 2021). Neurological conditions can diminish older persons' ability to maintain their physical and mental wellbeing (Howorth et al., 2019; Slwinski et al., 2021; Yiengprugsawan et al., 2012).

System Vulnerabilities

System vulnerabilities *included gaps in caregiving supports, gaps in mental health supports and barriers to accessing primary care.*

Gaps in Caregiving Supports

The increased rate of neurological disability in rural areas heighten the demand for family caregivers (Pérès et al., 2012; Williams et al., 2016; Yiengprugsawan et al., 2012). Although caregiving for a family member can be rewarding (Silverstein & Zuo, 2021; Yiengprugawan et al., 2012), gaps in home care and community resources means that family caregivers are often without any formal supports (Gong et al., 2012; Hagen et al., 2021b; Moholt et al., 2018; Pérès et al., 2012; Zhang, Wang, & Xu, 2021). Moreover, they are less likely to access respite care and community support, if it does exist, due to the stigma of mental health and wanting to be independent and maintain their privacy (Bayly et al., 2020; Buvneshkumar et al., 2018; Gong et al., 2012; Hagen et al., 2021a; Morgan et al., 2002; Nair et al., 2015; Williams et al., 2016). Yet family caregivers who are not supported are at risk to experience depleted energy and develop their own age-related emotional vulnerabilities (Brijoux et al., 2016; Silverstein & Zuo, 2021; Yiengprugsawan et al., 2012).

Gaps in Mental Health Supports

Older persons experiencing chronic stress, loss of social belonging, and neurological dysregulation face barriers in accessing mental health supports (Garabrant & Liu, 2021; Hagen et al., 2021a; House of Commons, 2019; Hu et al., 2018; Thapa et al., 2018; Wang et al., 2001; Windley & Scheidt, 1983; Silverstein et al., 2020; Zhang, Nazroo, & Vanhoutte, 2021). This is due to the inequitable distribution of mental health providers across rural regions, resulting in gaps (House of Commons, 2019; Martin et al., 2018; Yang et al., 2021; Zhang, Wang, & Xu, 2021).

Moreover, the mental health services are often not adapted to the unique rural needs (i.e., the lifestyle, stressors, fears, etc.) of farmers and rural community members, leading to a lack of trust and negative perceptions of the health care system (Hagen et al., 2021; House of Commons, 2019). Furthermore, the double stigma that depression is normal in older persons contributes to systemic barriers to mental health services (Abdul Manaf et al., 2016; Roy et al., 2017). Table three provides an overview of these physical and systemic barriers farmers face when accessing mental health services in rural areas (Hagen et al., 2021a).

Table 3

Challenges of Rural Residents in Accessing Mental Health Services

Identified Barriers	Description of Barriers
Financial	Difficulties in financially covering services: “If you don’t have a health plan you don’t get any coverage, and some health plans don’t cover it anyway” (Hagen et al., 2021a, p. 116).
Physical	Challenges in physically accessing services: “To drive to [a mental health service], it would’ve been over an hour, hour and a half each way... that’s hard. It’s a big commitment” (Hagen et al., 2021a, p. 118).
Stigma-related	Perception that the stigma surrounding mental illness still remains: “There seems to be still [stigma] despite all the work that’s been done about mental health... there’s still a horrible stigma. And I don’t think farmers would want to see their trucks parked out in front of the doctor’s office where everyone can see” (Hagen et al., 2021a, p. 118).

Barriers to Accessing Primary Care

Older persons living in rural areas also face barriers to primary and health promotion services throughout their lifespan (Baernholdt et al., 2012; Behera et al., 2016; Garabrant & Liu, 2021; Yang et al., 2021). Globally, primary health care services are inaccessible, unaffordable, and unsustainable in rural and remote areas (Hu et al., 2018; Nair et al., 2015). Therefore, rural individuals are at an increased risk of developing chronic health conditions that contribute to physical and mental health vulnerability (Hu et al., 2018; Kunde et al., 2018). On the other hand, these vulnerabilities are often counterbalanced by a healthy rural lifestyle (e.g., walking, fishing,

gardening, hunting, etc.) and living in a peaceful environment (Pérès et al., 2012; Ruan et al., 2022).

Developing the Strengths

Although rural norms of stoicism and independence do not support emotional regulation skills throughout the lifespan (Hagen et al., 2021a, 2021b; Hu et al., 2018; Kunde et al., 2018; Ruan et al., 2022; Roy et al., 2017; Scogin et al., 2016), farmers also engage in positive coping mechanisms that increase their resilience during periods of chronic stress, such as taking work breaks and talking amongst their peers, thereby leveraging community supports (Hagen et al., 2022; 2021; Jones-Bitton et al., 2020; Roy et al., 2017; Yazd et al., 2019). These coping strategies are aligned with traditional agrarian norms that include a sense of belonging and the value of local social supports (Hagen et al., 2022, 2021; Luo et al., 2017; Roy et al., 2017; Yazd et al., 2019). Rural older persons experience higher levels of trust among community members, engage in informal community activities, and are accustomed to living in isolation, than do their urban counterparts (Garagrandt & Liu, 2021; Herron et al., 2021). These interpersonal and cultural strengths protect older persons from developing mental illness despite periods of prolonged isolation and stress, such as during the COVID-19 pandemic (Garagrandt & Liu, 2021; Herron et al., 2021). These strengths must be acknowledged and developed to support rural dwellers as they experience age-related emotional vulnerabilities across their lifespans (Hagen et al., 2021; House of Commons, 2019; Kunde et al., 2018; Roy et al., 2017; Yazd et al., 2019).

Discussion

Key findings are that individual vulnerabilities, such as chronic stress, loss of belonging, and neurological dysregulation combined with system vulnerabilities of reduced access to primary care, mental health services, and respite care contribute to mental health disparities in older rural

persons. At the same time, the strengths of interconnected social support networks and rural norms of resilience can bolster mental wellness in older persons. In these ways the SAVI model used as a conceptual framework provides an understanding of both the vulnerabilities and the strengths associated with aging in rural settings. Focusing on strengthening the emotionally protective advantages of rural life, such as access to the large community networks (Hagen et al., 2021; House of Commons, 2019; Roy et al., 2017) could facilitate QoL and support older persons who are facing losses, neurological dysregulation, and chronic stresses.

Carefully examining both potential vulnerabilities and strengths within rural communities could be used to plan interventions that would reduce poor mental health outcomes (Romans et al., 2011). For example, privacy concerns that cause older persons to not access existing resources could be addressed by developing generic caregiving support systems (Hirsch & Cukrowicz, 2014). Also, the rural norms of protecting one another during crises could be mobilized into crises networks (Shucksmith, 2018).

Analyzing the complex issue of mental illness in rural regions using the SAVI model as a conceptual framework was a strategic choice related to its holistic and context-orientated perspective (Charles & Piazza, 2009), to bring balance to negative accounts of older persons emotion experiences (Charles, 2010; Charles & Luong, 2013). The SAVI model is valuable in analyzing systemic issues and discrediting societal stereotypes (e.g., the “golden years”, grumpy grandparents, etc.) associated with emotional wellbeing in older age (Charles & Luong, 2013, p. 443; Sun & Smith, 2017), thus providing a more balanced perspective about aging and older persons.

The SAVI model could be used in nursing education to promote examination of the heterogeneity of older persons and both the strengths and vulnerabilities of aging. We suggest this

as nurses' acceptance of negative stereotypes of cognitive and physical decline and beliefs that working with older people is simple could be related to seeing older people at their most vulnerable and dependant (Brown et al., 2008; Fox et al., 2016) and having their first clinical experiences in nursing home settings without understanding the complexity of these older persons (Dahlke et al., 2021). A more balanced approach that presents strengths as well as vulnerabilities of ageing could encourage more positive perceptions of older persons. This is important as nurses who have positive perceptions of older persons are more likely to recognize and appropriately meet their health and social needs of this population (Giles et al., 2008; McCarthy, 2003).

Researchers have thoroughly examined and validated the SAVI model's assumptions about the emotion-related strengths of ageing (Wrzus et al., 2013; Zacher & Rudolph, 2022). This strength can be applied as a strategy to balance the vulnerabilities of ageing in rural regions (Charles, 2010). For example, Blanchard-Fields et al. (2007) identified that older persons are more successful in managing interpersonal conflicts and demonstrating flexibility in resolving problems compared to younger adults. There is potential to engage these conflict resolution skills of older persons to mediate challenges within rural communities and enhance health outcomes for all ages (Sun & Sauter, 2021).

Although the SAVI model has many strengths, it is not without limitations. The central limitation is that researchers have not confirmed if the older persons sense of limited time left to live is associated with emotional wellbeing in older age (Hoppman et al., 2017). Psychologists claim that an extended versus limited future time perspective is more positively associated with subjective wellbeing (Demiray & Bluck, 2014; Kozik et al., 2015). Hoppman et al. (2017) highlights that older persons of the same chronological age think differently about whether or not their time is limited. This suggests that being an older age does not always mean you will have a

limited time perspective, as previously assumed in the SAVI model (Carstensen et al., 2011). More research is needed to investigate individual differences in perceptions of time and identify which perspective (i.e., limited versus extended) is more directly correlated to emotional wellbeing.

Another limitation of the SAVI conceptual framework is inaccurate definitions of time boundaries as to when the emotional regulation strengths are employed following a stressor (Scott et al., 2013). Scott et al. (2013) highlights that the SAVI model's assumption that age differences in emotional wellbeing arise 'immediately' after the event passes has not been validated, despite replicated attempts (Charles, 2010; Charles & Piazza, 2009). Research into age differences of experiencing less of a negative affect up to two days after a stressful event has been inconclusive (Johnson et al., 2008; Ong et al., 2006; van Eck et al., 1998). More research is needed to identify which factors may delay an older person's ability to rebound emotionally post-stressor (Carstensen et al., 2020; Isaacowitz & Blanchard-Fields, 2012).

The SAVI model is also associated with western assumptions, limiting understanding of cultural differences in older persons' perception of time and ability to employ the strengths of ageing (Sigdel, 2021; Twigg & Martin, 2014). The assumption that emotion-related motivations are tied to a limited time perspective originated on biomedical understandings of death as a life-limiting process (Sircova et al., 2015). Other cultures, including Indigenous communities, perceive death not as an end but as a transition period (Duggleby et al., 2015). To support the wellbeing of the heterogenous ageing population, researchers could consider adaptations to the SAVI model's theoretical underpinnings (Luijckx et al., 2020; Pace & Grenier, 2017).

Implications

Despite the limitations associated with the SAVI conceptual framework, it does provide a useful perspective of recognizing the strengths related to ageing as well as the vulnerabilities.

Nurses in the practice setting can use this focus to enhance the strengths and mitigate the emotion-related vulnerabilities of older people in rural areas. Future research examining issues affecting older persons in other underserved populations may similarly find the SAVI model helpful in illuminating vulnerabilities and community-based strengths to mitigate them.

This review revealed a lack of mental health and primary care services, specialized care professionals, and supportive resources for caregivers in rural areas for older persons, particularly farmers. Health care leaders could address these systemic vulnerabilities by integrating family-orientated, rurally adapted (e.g., to their fears, needs, and skills) mental health services into primary care. The SAVI model could also guide policymakers in evaluating the vulnerabilities as well as the strengths within existing health care systems and enhance or increase access to already established mental health supports for older persons.

Review Limitations

The results of this narrative review may not be generalizable to all countries or cultures. Given the nature of a narrative review, our search for relevant literature included research literature in English from three databases and theoretical literature. A systematic review of more databases and including other languages may have promoted the inclusion of perspectives from different countries and cultures.

Conclusion

The complex issue of mental illness and poor health outcomes in older persons living in rural regions were examined using the SAVI model as a conceptual framework. This provided identification of systemic factors preventing rural individuals from developing the emotional regulation advantages to overcome the physiological vulnerabilities associated with ageing. The SAVI model also encouraged identification of the strengths within rural communities that could

be leveraged to address emotional-related vulnerabilities of older adults, such as chronic stress, a loss of social belonging, and neurological dysregulation, as well as, systemic vulnerabilities in the rural health care systems. Limitations of the model were also identified, to guide future researchers in understanding individual and cultural differences in employing the strengths of ageing and perceptions of time.

References

- Abdul Manaf, M. R., Mustafa, M., Abdul Rahman, M. R., Yusof, K. H., & Abd Aziz, N. A. (2016). Factors influencing the prevalence of mental health problems among Malay elderly residing in a rural community: A cross-sectional study. *PLOS One*, *11*(6), Article e0156937. <https://doi.org/10.1371/journal.pone.0156937>
- Adjaye-Gbewonyo, D., Rebok, G. W., Gross, A. L., Gallo, J. J., & Underwood, C. R. (2019). Assessing urban-rural differences in the relationship between social capital and depression among Ghanaian and South African older adults. *PLOS One*, *14*(6), Article e0218620. <https://doi.org/10.1371/journal.pone.0218620>
- Baernholdt, M., Yan, G., Hinton, I., Rose, K., & Mattos, M. (2012). QoL in rural and urban adults 65 years and older: Findings from the national health and nutrition examination survey. *Journal of Rural Health*, *28*(4), 339-347. <https://doi.org/10.1111/j.1748-0361.2011.00403.x>
- Bayly, M., Morgan, D., Chow, A. F., Kosteniuk, J., & Elliot, V. (2020). Dementia-related education and support service availability, accessibility, and use in rural areas: Barriers and solutions. *Canadian Journal on Aging*, *39*(4), 545-585. <https://doi.org/10.1017/S0714980819000564>
- Behera, P., Sharon, P., Mishra, A. K., Nongkynrih, B., Kant, S., & Gupta, S. K. (2016). Prevalence and determinants of depression among elderly persons in a rural community in northern

India. *National Medical Journal of India*, 29(3), 129-135. <https://pubmed.ncbi.nlm.nih.gov/27808060/>

Blanchard-Fields, F. (2007). Everyday problem solving and emotion: An adult developmental perspective. *Current Directions in Psychological Science*, 61(1), 26-31. <https://doi.org/10.1111/j.1467-8721.2007.00469.x>

Blanchard-Fields, F., Mienaltowski, A., & Seay, R. B. (2007). Age differences in everyday problem-solving effectiveness: Older adults select more effective strategies for interpersonal problems. *Journal of Gerontology Psychological Sciences*, 62(1), 61-64. <https://doi.org/10.1093/geronb/62.1.P61>

Brijoux, T., Kricheldorf, C., Hüll, M., & Bonfico, S. (2016). Supporting families living with dementia in rural areas. *Deutsches Arzteblatt International*, 113(41), 681-687. <https://doi.org/10.3238/arztebl.2016.0681>

Brown, C. E., Wickline, M. A., Ecoff, L., & Glaser, D. (2008). Nursing practice, knowledge, attitudes and perceived barriers to evidence-based practice at an academic medical center. *Journal of Advanced Nursing*, 65(2), 371–381. <https://doi.org/10.1111/j.1365-2648.2008.04878.x>

Buckley, T. M., & Schatzberg, A. F. (2005). Aging and the role of the HPA axis and rhythm in sleep and memory-consolidation. *American Journal of Geriatric Psychiatry*, 13(5), 344-352. <https://doi.org/10.1176/appi.ajgp.13.5.344>

Burnette, D., Ye, X., Cheng, Z., & Ruan, H. (2021). Living alone, social cohesion, and QoL among older adults in rural and urban China: A conditional process analysis. *International Psychogeriatrics*, 33(5), 469-479. <https://doi.org/10.1017/S1041610220001210>

- Buvneshkumar, M., John, K. R., Logaraj, M. (2018). A study on prevalence of depression and associated risk factors among elderly in a rural block of Tamil Nadu. *Indian Journal of Public Health*, 62(2), 89-94. <https://pubmed.ncbi.nlm.nih.gov/29923530/>
- Canadian Coalition for Seniors' Mental Health. (n.d.). *Suicide risk and prevention of suicide*. <https://ccsmh.ca/projects/suicide/>
- Canadian Medical Association. (2016). *The state of senior's health care in Canada*. <https://www.cma.ca/sites/default/files/2018-11/the-state-of-seniors-health-care-in-canada-september-2016.pdf>
- Canadian Mental Health Association. (n.d.). *Making mental health matter in Alberta 2019 toolkit*. https://alberta.cmha.ca/wp-content/uploads/2019/10/Making-Mental-Health-Matter-in-Alberta_ToolKit_2019.pdf
- Carstensen, L. L., Isaacowitz, D. M., & Charles, S. T. (1999). Taking time seriously: A theory of socioemotional selectivity. *American Psychologist*, 54(3), 165-181. <https://doi.org/10.1037/0003-066X.54.3.165>
- Carstensen, L. L., Shavit, Y. Z., & Barnes, J. T. (2020). Age advantages in emotional experience persist even under threat from the COVID-19 pandemic. *Psychological Science*, 31(11), 1374-1385. <https://doi.org/10.1177/0956797620967261>
- Carstensen, L. L., Turan, B., Scheibe, S., Ram, N., Erner-Hershfield, H., Samanez-Larin, G. R., Brooks, K. P., & Nesselroade, J. R. (2011). Emotional experience improves with age: Evidence based on over 10 years of experience sampling. *Psychology and Aging*, 26(1), 21-33. <https://doi.org/10.1037/a0021285>

- Carver, L. F., Beamish, R., Phillips, S. P., & Villeneuve, M. (2018). A scoping review: Social participation as a cornerstone of successful aging in place among rural older adults. *Geriatrics*, 3(75), Article 75. <https://doi.org/10.3390/geriatrics3040075>
- Caxaj, C. (2016). A review of mental health approaches for rural communities: Complexities and opportunities in the Canadian context. *Canadian Journal of Community Mental Health*, 35(1), 29-45. <https://doi.org/10.7870/cjcmh-2015-023>
- Channer, N. S., Hartt, M., & Biglieri, S. (2020). Aging-in-place and the spatial distribution of older adult vulnerability in Canada. *Applied Geography*, 125 Article 10257. <https://doi.org/10.1016/j.apgeog.2020.102357>
- Charles, S. T. (2010). Strength and vulnerability integration: A model of emotional wellbeing across adulthood. *American Psychological Association*, 136(6), 1065-1091. <https://doi.org/10.1037/a0021232>
- Charles, S. T., & Luong, G. (2013). Emotional experience across adulthood: The theoretical model of strength and vulnerability integration. *Current Directions in Psychological Science*, 22(6), 443-448. <https://doi.org/10.1177/0963721413497013>
- Charles, S. T., & Piazza, J. R. (2009). Age differences in affective wellbeing: Context matters. *Social and Personality Psychology Compass*, 3(5), 711-724. <https://doi.org/10.1111/j.1751-9004.2009.00202.x>
- Coleman, P. G., Carare, R. O., Petrov, I., Forbes, E., Saigal, A., Spreadbury, J. H., Yap, A., & Kendrick, T. (2011). Spiritual belief, social support, physical functioning and depression among older people in Bulgaria and Romania. *Aging Mental Health*, 15(3), 327-333. <https://doi.org/10.1080/13607863.2010.519320>

- Dahlke, S., Kaligoui, M.R., & Swoboda, N. (2021). Registered nurses' reflections on their educational preparation to work with older people. *International Journal of Older People Nursing*. open access <https://doi.org/10.1111/opn.12363>
- Demiray, B., & Bluck, S. (2014). Time since birth and time left to live; opposing forces in constructing psychological well-being. *Ageing and Society*, 34(7), 1196-1218. <https://doi.org/10.1017/S0144686X13000032>
- Duggleby, W., Kuchera, S., MacLeod, R., Holyoke, P., Scott, T., Holtslander, L., Letendre, A., Moeke-Maxwell, T., Burhansstipanov, L., & Chambers, T. (2015). Indigenous peoples' experiences at the end of life. *Palliative and Supportive Care*, 13(6), 1721-1733. <https://doi.org/10.1017/S147895151500070X>
- Fastame, M. C., Ruiu, M., & Mulas, I. (2022). Hedonic and eudaimonic well-being in late adulthood: Lessons from Sardinia's blue zone. *Journal of Happiness Studies*, 23, 713-726. <https://doi.org/10.1007/s10902-021-00420-2>
- Fox, M. T., Butler, J. I., Persaud, M., Tregunno, D., Sidani, S., & McCague, H. (2016). A multimethod study of the geriatric learning needs of acute care hospital nurses in Ontario, Canada. *Research in Nursing & Health*, 39, 66–76, <https://doi.org/10.1002/nur.21699>
- Ferrari, A. U., Radaelli, A., & Centola, M. (2003). Invited review: Aging and the cardiovascular system. *Journey of Applied Physiology*, 95(6), 2591-2597. <https://doi.org/10.1152/jappphysiol.00601.2003>
- Garabrant, A. A., & Liu, C. (2021). Loneliness and activity engagement among rural homebound older adults with and without self-reported depression. *American Journal of Occupational Therapy*, 75(5), Article 7505205100. <https://doi.org/10.5014/ajot.2021.043828>

- Giles, H., Ryan, E. B., & Anas, A. P. (2008). Perceptions of intergenerational communications by young, middle-aged and older Canadians. *Canadian Journal of Behavioural Science*, 40(1), 21–30. <https://doi.org/10.1037/0008-400x.40.1.21>
- Gong, Y., Wen, X., Guan, C., Wang, Z., & Liang, Y. (2012). The associations between family characteristics and depressive symptoms in older adults: A community-based survey in rural China. *International Psychogeriatrics*, 24(8), 1226-1234. <https://doi.org/10.1017/S1041610211002663>
- Government of Canada. (2014). *Report on the social isolation of seniors*. <https://www.canada.ca/en/national-seniors-council/programs/publications-reports/2014/social-isolation-seniors/page05.html>
- Hagen, B. N. M., Sawatzky, A., Harper, S. L., O’Sullivan, T. L., & Jones-Bitton, A. (2022). “Farmers aren’t into the emotions and things, right?”: A qualitative exploration of motivations and barriers for mental health, help seeking among Canadian farmers. *Journal of Agromedicine*, 27(2), 113-123. <https://doi.org/10.1080/1059924X.2021.1893884>
- Hagen, B. N. M., Sawatzky, A., Harper, S. L., O’Sullivan, T. L., & Jones-Bitton, A. (2021). What impacts perceived stress among Canadian farmers? A mixed-methods analysis. *International Journal of Environmental Research and Public Health*, 18(14), Article 7366. <https://doi.org/10.3390/ijerph18147366>
- Helbich, M., Blüml, V., de Jong, T., Plener, P. L., Kwan, M.-P., & Kapusta, N. D. (2017). Urban-rural inequalities in suicide mortality: A comparison of urbanicity indicators. *International Journal of Health Geographics*, 16, Article 39. <https://doi.org/10.1186/s12942-017-0112-x>
- Herron, R. V., Newall, N. E. G., Lawrence, B. C., Ramsey, D., Waddell, C. M., & Dauphinais, J. (2021). Conversations in times of isolation: Exploring rural-dwelling older adults’

experiences of isolation and loneliness during the COVID-19 pandemic in Manitoba, Canada. *International Journal of Environmental Research and Public Health*, 18(6), Article 3028. <https://doi.org/10.3390/ijerph18063028>

Hirsch, J. K., & Cukrowicz, K. C. (2014). Suicide in rural areas: An updated review of the literature. *Journal of Rural Mental Health*, 38(2), 65-78. <https://doi.org/10.1037/rmh0000018>

Holecki, T., Rogalska, A., Sobczyk, K., Wozniak-Holecka, J., & Romaniuk, P. (2020). Global elderly migrations and their impact on health care systems. *Frontiers in Public Health*, 8, Article 386. <https://doi.org/10.3389/fpubh.2020.00386>

Hong, Q. N., Pluye, P., Fabregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M., Griffiths, F., Nicolau, B., O’Cathain, A., Rousseau, M., & Vedel, I. (n.d.). *Mixed methods appraisal tool (MMAT) version 2018*. http://mixedmethodsappraisaltoolpublic.pbworks.com/w/file/attach/127916259/MMAT_2018_criteria-manual_2018-08-01_ENG.pdf

Hoppman, C. A., Infurna, F. J., Ram, N., & Gerstorf, D. (2017). Associations among individuals’ perceptions of future time, individual resources, and subjective wellbeing in older age. *Journals of Gerontology*, 72(3), 388-399. <https://doi.org/10.1093/geronb/gbv063>

House of Commons. (2019). *Mental health: A priority for our farmers*. <https://www.ourcommons.ca/Content/Committee/421/AGRI/Reports/RP10508975/agrirp16/agrirp16-e.pdf>

Howorth, K., Paddick, S., Rogathi, J., Walker, R., Gray, W., Oates, L. L., Andrea, D., Safic, S., Urasa, S., Haule, I., & Dotchin, C. (2019). Conceptualization of depression amongst older

- adults in rural Tanzania: A qualitative study. *International Psychogeriatric*, 31(10), 1473-1481. <https://doi.org/10.1017/S1041610218002016>
- Hu, H., Cao, Q., Shi, Z., Lin, W., Jiang, H., & Hou, Y. (2018). Social support and depressive symptom disparity between urban and rural older adults in China. *Journal of Affective Disorders*, 237, 104-111. <https://doi.org/10.1016/j.jad.2018.04.076>
- Isaacowitz, D. M., & Blanchard-Fields, F. (2012). Linking process and outcome in the study of emotion and ageing. *Perspectives on Psychological Science*, 7, 3-17. <https://doi.org/10.1177/1745691611424750>
- Johnson, E. I., Husky., M., Grondin, O., Mazure, C. M., Doron, J., & Swendsen, J. (2008). Mood trajectories following daily life events. *Motivation and Emotion*, 32, 251-259. <https://doi.org/10.1007/s11031-008-9106-0>
- Jones-Bitton, A., Best, C., MacTavish, J., Fleming, S., & Hoy, S. (2020). Stress, anxiety, depression, and resilience in Canadian farmers. *Social Psychiatry and Psychiatry Epidemiology*, 55, 229-236. <https://doi.org/10.1007/s00127-019-01738-2>
- Kozik, P., & Hoppman, C. A., & Gerstorf, D. (2015). Future time perspective: Opportunities and limitations are differentially associated with subjective well-being and hair cortisol. *Gerontology*, 61(2), 166-174. <https://doi.org/10.1159/000368716>
- Kunde, L., Kőlves, K., Kelly, B., Reddy, P., & de Leo, D. (2018). “The masks we wear”: A qualitative study of suicide in Australian farmers. *The Journal of Rural Health*, 34(3), 254-262. <https://doi.org/10.1111/jrh.12290>
- Liang, H., Yue, Z., Liu, E., & Xiang, N. (2020). How does social capital affect individual health among the elderly in rural China? Mediating effect analysis of physical exercise and positive attitude. *PLOS One*, 15(7), Article 0231318. <https://doi.org/10.1371/journal.pone.0231318>

- Liao, H., & Carstensen, L. L. (2018). Future time perspective. *GeroPsych*, 31(3), 163-167.
<https://doi.org/10.1024/1662-9647/a000194>
- Li, W., Yang, S., Li, J., Yan, C., Gui, Z., & Zhou, C. (2022). Social capital and self-rated health among Chinese empty nesters: A multiple mediation model through sleep quality and psychological distress. *Journal of Affective Disorders*, 298, 1-9.
<https://doi.org/10.1016/j.jad.2021.11.016>
- Lin, Z., & Chen, F. (2018). Evolving parent-adult child relations: Location of multiple children and psychological wellbeing of older adults in China. *Public Health*, 158, 117-123.
<https://doi.org/10.1016/j.puhe.2018.02.024>
- Luijckx, K., van Boekel, L., Janssen, M., Verbiest, M., & Stoop, A. (2020). The academic collaborative centre older adults: A description of co-creation between science, care practice, and education with the aim to contribute to person-centred care for older adults. *International Journal of Environmental Research and Public Health*, 17(23), Article 9014.
<https://doi.org/10.3390/ijerph17239014>
- Luo, H., Wu, K., Qian, J., Cao, P., & Ren, X. (2017). Urban rural differences in the role of family support in physical and mental health of elderly people in China. *Journal of Sichuan University*, 48(2), 263-267. <https://pubmed.ncbi.nlm.nih.gov/28612539/>
- McCarthy, M. (2003). Situated clinical reasoning: Distinguishing acute confusion from dementia in hospitalized older adults. *Research in Nursing and Health*, 26(2), 90-101.
<https://doi.org/10.1002/nur.10079>
- Mikels, J. A., & Young, N. A. (2018). New direction in theories of emotion and aging. *Oxford Research Encyclopedias*. <https://doi.org/10.1093/acrefore/9780190236557.013.339>

- Moholt, J-M., Friberg, O., Blix, B. H., & Henriksen, N. (2018). Factors affecting the use of home-based services and out-of-home respite care services: A survey of family caregivers for older persons with dementia in northern Norway. *Dementia*, 19(5), 1712-1731. <https://doi.org/10.1177/1471301218804981>
- Morgan, D. G., Semchuk, K. M., Stewart, N. J., & D'Arcy, C. (2002). Rural families caring for a relative with dementia: Barriers to use of formal services. *Social Science and Medicine*, 55(7), 1129-1142. [https://doi.org/10.1016/S0277-9536\(01\)00255-6](https://doi.org/10.1016/S0277-9536(01)00255-6)
- Moroz, N., Moroz, I., & D'Angelo, M. S. (2020). Mental health services in Canada: Barriers and cost-effective solutions to increase access. *Healthcare Management Forum*, 33(6), 282-287. <https://doi.org/10.1177/0840470420933911>
- Nair, S. S., Raghuanath, P., & Nair, S. S. (2015). Prevalence of psychiatric disorders among the rural geriatric population: A pilot study in Karnataka, India. *Central Asian Journal*, 4(1), 1-10. <https://doi.org/10.5195/cajgh.2015.138>
- Neville, S., Adams, J., Napier, S., Shannon, K., & Jackson, D. (2018). "Engaging in my rural community": Perceptions of people aged 85 years and over. *International Journal of Qualitative Studies in Health and Well-being*, 13(1), Article 1503908. <https://doi.org/10.1080/17482631.2018.1503908>
- Nosraty, L., Jylhä, M., Raittila, T., & Lumme-Sandt, K. (2015). Perceptions by the oldest of old of successful aging, Vitality 90 + Study. *Journal of Aging Studies*, 32, 50-58. <https://doi.org/10.1016/j.jaging.2015.01.002>
- Ong, A. D., Bergeman, C. S., Bisconti, T. L., & Wallace, K. A. (2006). Psychological resilience, positive emotions, and successful adaptation to stress in later life. *Journal of Personality and Social Psychology*, 91(4), 730-749. <https://doi.org/10.1037/0022-3514.91.4.730>

- Ong, A. D., Rothstein, J. D., & Uchino, B. N. (2012). Loneliness accentuates age differences in cardiovascular responses to social evaluative threat. *Psychology and Aging, 27*, 190–198. <https://doi.org/10.1037/a0025570>
- Pace, J. E., & Grenier, A. (2017). Expanding the circle of knowledge: Reconceptualizing successful aging among North American older Indigenous peoples. *The Journals of Gerontology, 72*(2), 248-258. <https://doi.org/10.1093/geronb/gbw128>
- Pan American Health Organization. (n.d.). *Seniors and mental health*. https://www3.paho.org/hq/index.php?option=com_content&view=article&id=9877:seniors-mental-health&Itemid=0&lang=en#gsc.tab=0
- Parkar, S. R. (2015). Elderly mental health: Needs. *Mens Sana Monographs, 13*(1), 91-99. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4381326/>
- Pérès, K., Matharan, F., Allard, M., Amieva, H., Baldi, I., Barberger-Gateau, P., Berguga, V., Bourdel-Marchasson, I., Delcourt, C., Foubert-Samier, A., Fourrier-Regalt, A., Gaimard, M., Laberon, S., Maubaret, C., Postal, V., Chantal, C., Rainfray, M., Rascale, N., & Dartigues, J. (2012). Health and aging in elderly farmers: The AMI cohort. *BMC Public Health, 12*(558), 1-9. <https://doi.org/10.1186/1471-2458-12-558>
- Piazza, J. R., Charles, S. T., Luong, G., & Almeida, D. (2015). One size fits all? Applying theoretical predications about age and emotional experience to people with functional disabilities. *Psychology and Aging, 30*(4), 930-939. <http://dx.doi.org/10.1037/pag0000045>
- Pluye, P., Robert, E., Cargo, M., Bartlett, G., O’Cathain, A., Griffiths, F., Boardman, F., Gagnon, M. P., & Rousseau, M.C. (2011). *Proposal: A mixed methods appraisal tool for systematic mixed studies reviews*. <https://www.scienceopen.com/document?vid=feb74b8c-08fd-4b8c-ad08-65f7c2b8108e>

- Puvill, T., Lindenberg, J., de Craen, A. J. M., Slaets, J. P. J., & Westendorp, R. G. J. (2016). Impact of physical and mental health on life satisfaction in old age: A population based observational study. *British Medical Journal Geriatrics*, 16 Article 194. <https://doi.org/10.1186/s12877-016-0365-4>
- Rangarajan, S. K., Sivakumar, P. T., Manjunatha, N., Kumar, C. N., & Math, S. B. (2021). Public health perspectives of geriatric mental health care. *Indian Journal of Psychological Medicine*, 43(5), S1-S7. <https://doi.org/10.1177/02537176211047963>
- Richman, L., Pearson, J., Beasley, C., & Stanifer, J. (2019). Addressing health inequalities in diverse, rural communities: An unmet need. *Population Health*, 7, Article 100398. <https://doi.org/10.1016/j.ssmph.2019.100398>
- Richter, D., Wall, A., Bruen, A., & Whittington, R. (2019). Is the global prevalence rate of adult mental illness increasing? Systemic review and meta-analysis. *Acta Psychiatrica Scandinavica*, 140(5), 393-407. <https://doi.org/10.1111/acps.13083>
- Romans, S., Cohen, M., & Forte, T. (2011). Rates of depression and anxiety in urban and rural Canada. *Social Psychiatry & Psychiatric Epidemiology*, 46, 567-575. <https://doi.org/10.1007/s00127-010-0222-2>
- Roy, P., Tremblay, G., Robertson, S., & Houle, J. (2017). “Do it all by myself”: A salutogenic approach of masculine health practice among farming men coping with stress. *American Journal of Men’s Health*, 11(5), 1536-1546. <https://doi.org/10.1177/1557988315619677>
- Ruan, H., Shen, K., & Chen, F. (2022). Negative life events, social ties, and depressive symptoms for older adults in China. *Frontier in Public Health*, 9, Article 774434. <https://doi.org/10.3389/fpubh.2021.774434>

- Saifullah, A. D., Latifah, N., Artanti, E. R., & Cahyani, K. D., Rahayu, U., Paramarta, L., Izzati, R. M., Priharjo, R., & Warsini, S. (2020). Mental distress in rural areas of Indonesia. *Nurse Media Journal of Nursing*, 10(1), 1-10. <https://doi.org/10.14710/nmjn.v10i1.23244>
- Scott, S. B., Sliwinski, M. J., & Blanchard-Fields, F. (2013). Age differences in emotional responses to daily stress: The role of timing, severity, and global perceived stress. *Psychology and Aging*, 28(4), 1076-1057. <https://doi.org/10.1037/a0034000>
- Scogin, F., Morthland, M., Dinapoli, E. A., LaRocca, M. A., & Chaplin, W. (2016). Pleasant events, hopelessness, and QoL in rural older adults. *Journal of Rural Health*, 32(1), 102-109. <https://doi.org/10.1111/jrh.12130>
- Shim, R. S. (2020). Mental health inequities in the context of COVID-19. *JAMA Network*, 3(9), Article e2020104. <https://doi.org/10.1001/jamanetworkopen.2020.20104>
- Shucksmith, M. (2018). Re-imagining the rural: From rural idyl to good countryside. *Journal of Rural Studies*, 59, 163-172. <https://doi.org/10.1016/j.jrurstud.2016.07.019>
- Sigdel, K. (2021). Conceptualizing of aging literature: A global perspective. *Journal of English Studies*, 12, 104-109. <https://doi.org/10.3126/ojes.v12i1.39099>
- Silverstein, M., Gong, C. H., & Kendig, H. (2020). Perceived availability of future care and depressive symptoms among older adults in China: Evidence from CHARLS. *BMC Geriatrics*, 20 Article 31. <https://doi.org/10.1186/s12877-020-1435-1>
- Silverstein, M., & Zuo, D. (2021). Grandparents caring for grandchildren in rural China: Consequences for emotional and cognitive health in later life. *Aging and Mental Health*, 25(11), 2042-2052. <https://doi.org/10.1080/13607863.2020.1852175>
- Sircova, A., van de Vijver, F., Osin, E., Milfont, T. L., Fieulaine, N., Kislali-Erginbilgic, A., & Zimbardo, P. G. (2015). Time perspective profiles of cultures. In M. Stolarski, W. van Beek

& N. Fieulaine (Eds.), *Time perspective theory: Review, research, and application* (pp. 169-187). New York: Springer Publishing Company.

Slwinski, M. J., Freed, S., Scott, S. B., Pasquini, G., & Smyth, J. M. (2021). Does chronic stress moderate age differences in emotional wellbeing? Testing predictions of strength and vulnerability integration. *The Journals of Gerontology*, 76(6), 1104-1113. <https://doi.org/10.1093/geronb/gbaa174>

St. John., P. D., Menec, V., Tate, R., Newall, N. E., Cloutier, D., & O'Connell, M. (2021). Depressive symptoms in adults in rural and urban regions of Canada: A cross-sectional analysis of the Canadian longitudinal study on aging. *BMJ Open*, 11, Article e048090. <https://doi.org/10.1136/bmjopen-2020-048090>

Statistics Canada. (n.d.-a). *The chief public health officer's report on the state of public health in Canada, 2014: Public health in the future*. <https://www.canada.ca/en/public-health/corporate/publications/chief-public-health-officer-reports-state-public-health-canada/chief-public-health-officer-report-on-state-public-health-canada-2014-public-health-future/changing-demographics.html>

Statistics Canada. (n.d.-b). *Impacts on mental health*. <https://www150.statcan.gc.ca/n1/pub/11-631-x/2020004/s3-eng.htm>

Sullivan-Singh, S. J., Stanton, A. L., & Low, C. A. (2015). Living with limited time: Socioemotional Selectivity Theory in the context of health adversity. *Journal of Personality and Social Psychology*, 108(6), 900-916. <https://doi.org/10.1037/a0039047>

Sun, J. K., & Smith, J. (2017). Self-perceptions of aging and perceived barriers to care: Reasons for healthcare delay. *The Gerontologist*, 57(suppl_2), S216 -S226. <https://doi.org/10.1093/geront/gnx014>

- Sun, R., & Sauter, D. (2021). Sustained stress reduces the age advantages in emotional experience of older adults: Commentary on Carstensen et al. (2020). *Psychological Science*, 32(12), 2035-2041. <https://doi.org/10.1177/09567976211052476>
- Sun, Y., Zhang, D., Yang, Y., Wu, M., Xie, H., Zhang, J., Jia, J., & Su, Y. (2017). Social support moderates the effects of self-esteem and depression on QoL among Chinese rural elderly in nursing homes. *Archives of Psychiatric Nursing*, 31(2), 197-204. <http://dx.doi.org/10.1016/j.apnu.2016.09.015>
- Thapa, D. K., Visentin, D., Kornhaber, R., & Cleary, M. (2018). Migration of adult children and mental health of older parents 'left behind': An integrative review. *PLOS One*, 13(1), Article 0205665. <https://doi.org/10.1371/journal.pone.0205665>
- Twigg, J. W., & Martin, W. (2014). The challenge of cultural gerontology. *The Gerontologist*, 55(3), 353-359. <https://doi.org/10.1093/geront/gnu061>
- van Eck, M., Nicolson, N. A., & Berkhof, J. (1998). Effects of stressful daily events on mood states: Relationship to global perceived stress. *Journal of Personality and Social Psychology*, 75(6), 1572-1585. <https://doi.org/10.1037//0022-3514.75.6.1572>
- Wainberg, M. L., Scorza, P., Shultz, J. M., Helpman, L., Mootz, J. J., Johnson, K. A., Neria, Y., Bradford, J. E., Oquendo, M. A., & Arbuckle, M. A. (2017). Challenges and opportunities in global mental health: A research-to-practice perspective. *Current Psychiatry Reports*, 19(5), Article 28. <https://doi.org/10.1007/s11920-017-0780-z>
- Wang, J., Snyder, M., & Kaas, M. (2001). Stress, loneliness, and depression in Taiwanese rural community-dwelling elders. *International Journal of Nursing Studies*, 38(3), 339-347. [https://doi.org/10.1016/s0020-7489\(00\)00072-9](https://doi.org/10.1016/s0020-7489(00)00072-9)

- Williams, A., Sethi, B., Duggleby, W., Ploeg, J., Markle-Reid, M., Peacock, S., & Ghosh, S. (2016). A Canadian qualitative study exploring the diversity of the experience of family caregivers of older adults with multiple chronic conditions using a social location perspective. *International Journal of Equity in Health*, 15, Article 40. <https://doi.org/10.1186/s12939-016-0328-6>
- Windley, P. G., & Scheidt, R. J. (1983). Service utilization and activity participation among psychologically vulnerable and well elderly in rural small towns. *The Gerontologist*, 23(3), 283-287. <https://doi.org/10.1093/geront/23.3.283>
- World Health Organization. (2013). *Comprehensive mental health action plan: 2013-2020*. https://apps.who.int/gb/ebwha/pdf_files/WHA66/A66_R8-en.pdf?ua=1
- World Health Organization. (2014). *First WHO report on suicide prevention*. <https://www.who.int/news/item/04-09-2014-first-who-report-on-suicide-prevention>
- World Health Organization. (2017). *Mental health of older adults*. <https://www.who.int/news-room/fact-sheets/detail/mental-health-of-older-adults>
- World Health Organization. (2019a). *Risk reduction of cognitive decline and dementia: WHO guidelines*. <https://www.who.int/publications/i/item/9789241550543>
- World Health Organization. (2019b). *The WHO special initiative for mental health (2019-2023): Universal health coverage for mental health*. <https://apps.who.int/iris/bitstream/handle/10665/310981/WHO-MSD-19.1-eng.pdf?sequence=1&isAllowed=y>
- World Health Organization. (2021). *Suicide*. <https://www.who.int/news-room/fact-sheets/detail/suicide>

- World Health Organization. (2022). *Ageing and health*. <https://www.who.int/news-room/factsheets/detail/ageing-and-health>
- Wrzus, C., Müller, V., Wagner, G. G., Lindenberger, U., & Riediger, M. (2013). Affective and cardiovascular responding to unpleasant events from adolescence to older age: Complexity of events matters. *Developmental Psychology*, *49*(2), 384-397. <https://doi.org/10.1037/a0028325>
- Yang, L., Wang, L., & Dai, X. (2021). Rural-urban and gender differences in the association between community care services and elderly individuals' mental health: A case from Shaanxi province, China. *BMC Health Services Research*, *21*, Article 106. <https://doi.org/10.1186/s12913-021-06113-z>
- Yazd, S. D., Wheeler, S. A., & Zuo, A. (2019). Key risk factors affecting farmers' mental health: A systemic review. *International Journal of Environmental Research and Public Health*, *16*(23), Article 4849. <https://doi.org/10.3390/ijerph16234849>
- Yiengprugsawan, V., Seubsman, S., & Sleigh, A. C. (2012). Psychological distress and mental health of Thai caregivers. *Psychology of Wellbeing*, *2*, Article 4. <https://doi.org/10.1186/2211-1522-2-4>
- Zacher, H., & Rudolph, C. W. (2022). Strength and vulnerability: Indirect effects of age on changes in occupational wellbeing through emotion regulation and physiological disease. *Psychology and Aging*, *37*(3), 357–370. <https://doi.org/10.1037/pag0000671>
- Zhang, N., Nazroo, J., & Vanhoutte, B. (2021). The relationship between rural to urban migration in China and risk of depression in later life: An investigation of life course effects. *Social Science and Medicine*, *270*, Article 113637. <https://doi.org/10.1016/j.socscimed.2020.113637>

- Zhang, T., Wang, X., & Xu, Y. (2021). Multidomain social determinants of depressive symptoms for the elderly with chronic diseases: Evidence from the China Health and Retirement Longitudinal Survey. *Healthcare*, 9(12), Article 1765. <https://doi.org/10.3390/healthcare9121765>
- Zhang, X., & Silverstein, M. (2022). Intergenerational emotional cohesion and psychological wellbeing of older adults in rural China; A moderated mediation model of loneliness and friendship ties. *Psychological Sciences and Social Sciences*, 77, 525-235. <https://doi.org/10.1093/geronb/gbab122>
- Zhou, R., Chen, H., Zhu, L., Chen, Y., Chen, B., Li, Y., Chen, Z., H., & Wang, H. (2021). Mental health status of the elderly Chinese population during COVID-19. An online cross-sectional study. *Frontiers in Psychiatry*, 12, 1-10. <https://doi.org/10.3389/fpsy.2021.645938>
- Zhou, L., Wang, G., Jia, C., Ma, Z. (2019). Being left-behind, mental disorder, and elderly suicide in rural China. A case control psychological autopsy study. *Psychological Medicine*, 49(3), 458-464. <https://doi.org/10.1017/S003329171800106X>