Concept Clarification and Assessment of Social Isolation and Social Support in Older Adults

White Paper

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Executive Summary

The social wellbeing of older adults is essential for their quality of life and guards against important physical illnesses. This allows the growing population of older adults to successfully age in their communities and curbs healthcare spending resulting from hospitalization and institutionalization. The Older Americans Act supports this population through the provision of a wide array of social services and programs including home- and community-based services (HCBS). Recent evaluations of these programs has highlighted the vulnerability of these groups and the need for better measurement tools to assess important social concepts such as social isolation and social support.

Social isolation and social support are complex concepts that have been linked to the mental and physical health of older adults for decades. However, there is no consensus on their definitions or scope, which is reflected in the heterogeneity of measurement tools. These disparities have not allowed the scientific community to provide evidence-based recommendations and guidance for programs and policies that aim at alleviating social isolation and providing social support for older adults. The purpose of this review is to summarize the literature in order to clarify the concepts of social support and social isolation, review existing measurement tools, and identify tools that have been validated in the older adult population.

A literature search was conducted in the academic databases Psychinfo, CINAHL, and Medline. The terms *definition*, *define*, *concept*, *theory*, *description* and *meaning* were used in the search for definitions, and *measurement or measure or scale or index or questionnaire or instrument* in the search for measurement tools. Identifying definitions and measurement tools followed the snowball technique. Results emphasized the multidimensionality of these concepts. Dimensions that are important to consider when defining the concept of social support include the degree of subjectivity, directionality, sources, functions; intentionality and impact, structure, and mechanisms. The existing definitions of social isolation also contained a variety of dimensions; structure, degree of subjectivity, quality, function, engagement, duration and intentionality, and impact. Many of these dimensions have significant implications on the choice of measurement tool to be used.

To summarize measurement tools for social support, they were grouped as either measuring perceived, actual social support, or both. While many of the tools included the three common functions; instrumental, emotional and informational support, scoring did not necessarily allow the separate examination of these functions. Most of the measurement tools referred to informal sources for social support. All of the social isolation measurement tools included items that assessed the quantity of the individual's social network, and much fewer tools addressed the quality of the relationships. There were items in the social support tools that examined some social isolation dimensions and vice versa, but, again, the scoring system did not allow for the separation of these concepts. This would help better understand how these two concepts relate to each other in older adults.

It is clear that no single instrument can capture all of the dimensions included within social support and social isolation. However, an understanding of the context and purpose of measurement may help in the choice of existing tools. What social support and social isolation mean to older adults is of particular importance, given the physical and mental limitations they may be facing. Therefore, validation of existing tools in this population is necessary. Furthermore, having a strong conceptual basis for the

future development of tools that can further our understanding of how to best address these growing challenges is urgently needed.

1. Background

The Older Americans Act (OAA), first enacted in 1965, serves to preserve the right for older Americans to 'age in place'[1], and to support a dignified aging process and decrease institutionalization (Colello, 2021). The legislation provides the 50 states and six territories with grants to deliver a wide array of social services and programs for individuals aged 60 years or older. Most of these programs and activities are administered by the Administration on Aging (AoA) in the Administration for Community Living (ACL) within the Department of Health and Human Services (HHS). This occurs through a nationwide network of State Units on Aging, Area Agencies on Aging, in addition to many other aging and social service providers in local communities. The OAA programs and services include home- and community-based services (HCBS) to support older adults who are at an increased risk of institutionalization. HCBS provides older adults with the option of receiving services in their homes. HCBS fall into three categories: 1) in-home services (such as personal care, home-delivered meals, and homemaker assistance); 2) community services (such as adult day care, congregate meals, and legal and mental services); and 3) other services, which include transportation, case management, and other assistance.

Title III C: Nutrition Service Program (NSP), which is part of the HCBS, provides nutrition services for older adults, targets those with the greatest need for food assistance; members of racial and ethnic minority groups, lower socioeconomic status, rural residents, those with limited English proficiency, and those at risk of social isolation and/or institutionalization (Barrett & Schimmel, 2010). The purpose of the NSP is to 1) decrease hunger and food insecurity; 2) promote socialization; and 3) support the health and wellbeing of older adults by providing access to nutrition and other disease prevention and health promotion services to prevent or delay the onset of adverse health conditions (Congressional Research Service, 2014). The NSP provides meals and a range of nutrition-related services such as nutrition education, screening, assessment, and counseling. The meals provided are either congregate meals (CM), which are offered at locations such as senior centers, community centers, schools, churches and adult day care centers, or home-delivered meals (HDM), which are delivered to homebound older adults (Mabli et al., 2017).

Meals served in a communal space for CM recipients provide chances for socialization, such as interacting with staff and peers during meal times and participating in social activities. Unfortunately, older adults on HDM programs may not have these opportunities, and so may potentially be more socially deprived. It is suggested that the single and brief interaction that HDM participants have with the person delivering their meals may be the only direct human interaction an older adult has for the entire day (Thomas et al., 2016). This highlights the importance of social contact that an older homebound adult has with the person delivering meals in potentially preventing social isolation (Thomas et al., 2016).

In 2020, the 116th United States Congress reauthorized the OAA for a five-year period through FY2024, renaming the legislation as the Supporting Older Americans Act of 2020. Key amendments to the bill emphasize two of the increasing societal challenges that face this vulnerable population: social determinants of health (economic and social conditions influencing difference is health status) and social isolation and loneliness. Specifically, the Act bolsters efforts to combat social isolation, including screening for social isolation as well as education on preventing and responding to negative health effects associated with social isolation. Furthermore, it addresses an array of health promotion and disease prevention activities, such as self-management of chronic disease and the prevention of falls.

These activities support the NSP goal of health promotion and disease prevention, and assist older adults in living independently in their communities. These efforts can also decrease healthcare utilization and costs.

2. Introduction

Health is defined as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (International Health Conference, 2002). Social well-being is considered as important as physical well-being for older adults (Montross et al., 2006). Furthermore, social isolation can also pose independent risks for physical and mental health (Cornwell & Waite, 2009). Older adults place emphasis on their social relationships, identifying them as an important aspect of their aging experience (Montross et al., 2006; Teater & Chonody, 2020). In fact, one of the most frequently used services that older individuals seek as they age, to assist them in living independently, are social services (such as homecare, social activities and personal calls from a network of older adults designed to prevent social isolation) (van Bilsen et al., 2008).

Social isolation has been linked to depression, stress, anxiety, suicide and worsening quality of life among older adults (Monk, 2000; Moreno-Tamayo et al., 2020; Santini et al., 2020). Social isolation has also been associated with deteriorating physical capability and malnutrition (Boulos et al., 2017; del Pozo Cruz et al., 2021). The deterioration of both physical and mental health can threaten the ability of older adults to continue living independently in their communities. Social support can assist older adults in adapting to some of the physical and mental decline that occurs in older age (Ellwardt et al., 2013; Hays et al., 1997).

Social support is an important determinant of health status which can attenuate social disparities that might impact the health of older adults (Rueda, 2012). A supportive social environment can increase the survival of older adults with multimorbidities (Olaya et al., 2017), which represents the majority of NSP recipients. Having high levels of social support can help reduce fear of falls in older adults, a major public health concern for this population, and significant contributor to healthcare costs (John A. Rizzo et al., 1998; Quach, 2018; Vo et al., 2020).

The lack or deficiency of social relationships negatively impacts the use of preventive health services and has been associated with increased hospitalization, institutionalization and healthcare cost (Longman et al., 2013; Vozikaki et al., 2017). Older adults who cannot maintain independence are a huge cost to the healthcare system as a result of health expenditures for hospitalization and/or institutionalization (Office of the Actuary, 2016). Evidence suggests that healthcare models that incorporate social support services for older adults have shown a decrease in healthcare utilization and costs (Shier et al., 2013; Spiers et al., 2019). Therefore, attention to social isolation and social support in older adults can lessen the burden on health systems.

The recent lifestyle changes that occurred as a result of the COVID-19 pandemic have impacted social relationships and social support as a result of the imposed quarantine, isolation, and social distancing (Emerson, 2020; Manca et al., 2020). Older adults were shown to be at an increased risk for severe COVID-19 infection, and so the benefit of these lifestyle changes may have outweighed the risk of social isolation and loss of social support. Some of the risk of this enforced social isolation was demonstrated through the worsening or development of new neuropsychiatric symptoms, and cognitive decline (Noguchi et al., 2021; Sepúlveda-Loyola et al., 2020). These findings, when combined with the abovementioned role that social connectedness and social support can play in supporting older adults and curbing healthcare costs,

highlight the importance and urgency of the prevention and management of social isolation and the provision of social support in this population.

Despite their importance, planning, design, monitoring and evaluation of effective interventions for social isolation and social support may be problematic. This may be the result of the variability in the use of terminology referring to these concepts and the measurement tools used for evaluating them, rendering comparisons and interpretations challenging (Cohen et al., 2001; Nicholson Jr., 2009). Operationalizing some of these concepts in the older adult population can be a further challenge because, for example, getting older does not necessarily mean being socially isolated (English & Carstensen, 2014; Szanton et al., 2016). There is variability in the course that social relationships take as one ages. It is hard to tell to what extent loneliness, for example, is reflective of an actual loss of social contact (Cornwell & Waite, 2009). People who are socially active and surrounded by an extensive social network may still feel isolated (Cornwell & Waite, 2009). Older individuals may also be satisfied with a smaller but closer group of people, so it seems essential to understand the degree to which older adults' perceptions reflect actual social situations (English & Carstensen, 2014). And therefore, defining and operationalizing these concepts may need special consideration for the older adult population. The aim of this study, therefore, is to critically appraise the conceptualization and measurement of social isolation and social support in the literature for use in programs and interventions targeting older adults.

3. Methodology

Existing definitions and measurement tools of social support and social isolation were identified through a search of academic databases, including Psychinfo, CINAHL, and Medline. Identifying definitions and measurement tools followed the snowball technique. Using this technique, all references to definitions in the articles found through initial database searches were located. These references were then obtained, further references identified from the text, and so on. Although these searches were extensive, they cannot be said to be exhaustive. Despite this, the definitions located represent the bulk of those that exist and are considered adequate for a critical appraisal of the literature. A statement delineating the concepts of social support or social isolation was considered under the following circumstances: (a) the author explicitly identifies it as a definition; (b) the author uses it to guide his or her discussion of the concept of social support or social isolation. All identified definitions were tabulated, and characteristics were grouped according to the dimension that they belong to, to illustrate the scope of the concept. For the identification of measurement tools, only studies that discussed the development of a measurement tool were retained. Studies that developed measurements to be used for special populations (such as pregnant women) were excluded. The different dimensions of the measurement tools were determined and tabulated. Initial searches were conducted in October 2020-January 2021.

3.1. Social support

For the identification of definitions, the term *social support* was entered into the search of the databases, which resulted in an unwieldy number of articles. Subsequent searches included terms such as *definition*, *define*, *concept*, *theory*, *description* and *meaning*. These searches were more manageable and uncovered many, but not all, of the articles used in this study. The inclusion criteria involved books and academic journal articles in English published between January 2001 and December 2020. For measurement tools, the term *social support* and *measurement or measure or scale or index or questionnaire or instrument* was entered into the search of these databases.

An additional category of global/undifferentiated social support was created to denote definitions and/or measurements that did not differentiate the function of support or used descriptors that were too broad to be grouped under the commonly known functions.

3.2. Social isolation

The terms *social isolation* and *definition*, *define*, *concept*, *theory*, *description* and *meaning* were used as the search terms for the databases. Books and academic journal articles were included if they were published in English, between January 2007 and December 2020. Research on social isolation is less abundant than that on social support, and so we used a seminal concept analysis article (Nicholson Jr., 2009), which reviewed literature between 1983 and 2007. The terms *social isolation* and *measurement or measure or scale or index or questionnaire or instrument* was used to search for measurement tools of social isolation.

4. Results

4.1. Concept clarification

4.1.1. Social support

Different dimensions are subsumed within the umbrella of social support, however, no single definition grasps the complexity of the phenomenon (Turner & Brown, 2010). A number of dimensions are considered when defining the concept of social support, which include degree of subjectivity (actual/available or perceived); directionality (received or provided); sources (e.g. formal or informal); function (e.g. emotional, informational and tangible); intentionality and impact (positive or negative); structure (e.g. number and frequency of social ties); and mechanisms (main or buffering effect). It is important to note that the process of social support does not occur in a vacuum, but within a social ecology and is shaped by the social context (e.g. stressors and available social roles), characteristics of the provider and the recipient (e.g. social skills, personality and distress) (Vaux, 1990a). A summary of the dimensions included in the various definitions (Appendix a) is provided in **Table 1**.

Table 1: Dimensions addressed in the definitions of social support.

Dimensions	Evaluation			Directionality			Source		Function				Additional dimensions	Other constructs
Author, year	Actual	Perceived	Adequacy	Quality	Received	Provided	Formal	Informal	Instrumental	Emotional	Informational	Global		
Caplan, 1974	✓	X	X	X	✓	X	X	✓	X	X	X	✓	Mechanism of action	X
Cobb, 1976	X	✓	X	X	✓	X	X	✓	X	X	✓	X	X	X
Kahn, 1979	✓	X	X	X	✓	✓	X	X	✓	✓	X	X	X	X
Schaefer et al., 1981	X	✓	✓	X	✓	✓	✓	✓	X	X	X	X	X	X
Pilisuk, 1982	✓	X	X	X	✓	X	X	✓	✓	✓	X	X	X	X
Procidano & Heller, 1983	X	✓	X	✓	✓	X	X	X	X	X	✓	✓	X	X
Leavy, 1983	✓	X	✓	X	✓	X	X	✓	X	X	X	✓	X	X
Berkman, 1983	✓	X	X	X	✓	X	X	✓	✓	✓	✓	X	X	X
Barrera & Ainlay, 1983	✓	X	X	X	✓	✓	X	✓	✓	✓	✓	X	X	Intimate and positive social interaction
Shumaker & Brownell, 1984	X	X	X	X	✓	✓	X	X	X	X	X	X	Intent of benefit	X
Thoits, 1986	✓	X	X	X	X	X	X	✓	X	X	X	X	Mechanism of action	Coping, active participation

Heller et al., 1986	X	✓	X	X	✓	X	X	✓	X	X	X	X	X	X
Lin, 1986	X	✓	X	X	✓	X	X	✓	✓	✓	X	X	X	X
Vaux, 1988	X	✓	X	X	✓	✓	X	✓	X	X	X	X	X	X
Hupcey, 1998	✓	X	X	X	✓	✓	X	✓	X	X	X	✓	Intent of benefit	X
Cohen et al., 2000	✓	✓	X	X	✓	X	✓	✓	X	X	X	✓	X	X
Cohen, 2004	✓	X	X	X	✓	X	X	X	✓	✓	X	X	Intent of benefit	X
Finfgeld-Connett, 2005	✓	X	X	X	✓	✓	X	X	✓	✓	X	X	X	X
Turner & Brown, 2010	✓	✓	X	X	✓	X	X	X	X	X	X	✓	Structural support	X

Dimensions

a. Degree of subjectivity

A critical dimension in defining social support is to clarify the degree of subjectivity of the construct. Enacted or experienced social support refers to the actual support available, a more observable, objective indicator (Cohen, Underwood, et al., 2000; Lin, 1986). Perceived support, on the other hand, is a reflection of the recipient's understanding and evaluation of the support assumed to be available, including adequacy and quality of that support (I. G. Sarason & Sarason, 1985). Both enacted and perceived social support have shown independent pathways and relationships with health (O'Conor et al., 2019; Stephens et al., 2011; Yan, 2020). More controversy lies in the relationship between received social support and health (Uchino, 2009). Some argue that the positive correlation is context specific, depending on factors such as the need for social support, and the form of support received. The degree of correlation between the two types of support has not been consistent in the literature, which may be partially the result of a poor understanding of the exact mechanisms by which each exert their impact on health and well-being (Uchino, 2009). Another possibility may be the lack of consistency in definition and/or validity of the tools used in the populations being measured.

b. Mechanism(s)

Social support is hypothesized to exert its effect directly; commonly referred to as main or direct effect, and/or through altering the response to stress; the buffering or moderator effect. The main-effect model proposes that social support acts directly to benefit the individual's daily living by fulfilling his/her basic social needs (Thoits, 1986), or through emotionally induced effects on immune system functioning (Pilisuk, 1982). While the buffering effect of social support is assumed to be related to a stressful situation, and acts by facilitating coping and adaptation (Cassel, 1976). Numerous biopsychosocial mechanisms have been proposed to explain the positive impact of social support on resilience to stress but the exact mechanisms remain largely unknown (Ozbay et al., 2007).

The two mechanisms proposed above are not mutually exclusive, however, some authors choose to support one mechanism over the other in their definitions of social support, which may have repercussions on the operationalization of these definitions. Structural and objective aspects of social support have been proposed to exert main effects, while perceived social support is suggested to operate through a stress buffering mechanism (Berkman and Glass 2000). The difference between definitions that adopt a buffering-effect model and those that subscribe to the main-effect model also lies in the timing of support, where main-effects elude to a more continuous role for social support and buffering effects highlight the role of social support in times of stress (Cohen & Wills, 1985).

c. Directionality

Few authors include terminology that recognizes the bidirectionality of social support (Cohen, 2004; Turner & Brown, 2010), as most only refer to the receipt of social support. Equal exchange is believed to be optimal for supportive functions that are exchanged through social relationships (Homans, 1961). Furthermore, there is evidence to support the positive role that social support can have on the provider and not just the receiver (Antonucci & Jackson, 1990). Older adults who provide social support have a decreased likelihood of depressive symptoms and greater life satisfaction (Reed, 2005). Many of the supportive functions depend on having the ability and resources to meet the needs of another person, which are likely to decrease with age (Antonucci & Jackson, 1990). Therefore, older adults are more

prone to mental disorders and decreased quality of life. Furthermore, the inability to reciprocate may be a barrier to asking for help from natural support systems such as family, friends and/or neighbors (Antonucci & Jackson, 1990). In such situations, older adults may have an increased need for formal supportive functions, such as those provided by healthcare providers, local and national organizations.

d. Source

Most of the literature discussing support is focused on natural support systems, or informal sources of support that may be available to an individual by way of his/her social network. Yet, other formal supportive services provided may be available to provide assistance for vulnerable populations or subgroups. For example, Cohen and colleagues (Cohen, Underwood, et al., 2000) identify '*formal support groups*' as one of the societal resources for support provisions in their definition. However, the majority of reviewed definitions do not reference the range of potential sources for social support.

Informal support is often considered as the unpaid provision of assistance that is commonly provided by family members, close friends, and neighbors, while formal support is care that is provided by professionals who are paid for their service (Gaugler & Kane, 2001; Williams & Dilworth-Anderson, 2002). And so, social relationships constitute a viable source for social support, however many definitions suggest that it is the sole source within which social support is exchanged (Kahn, 1979). In making that assumption, definitions may imply that support is synonymous with the function of one's social relationships, losing any unique utility (K. Rook, 1983). These issues makes it increasingly challenging to operationally distinguish between these two concepts. And so, while social network analysis can certainly provide information on the structure of the informal social support available, however the notion that all networks are supportive and/or that these networks are the single source for support is often misleading (Schaefer et al., 1981).

e. Function

The function of social support is one of the most commonly mentioned dimensions in defining the concept. The three most common functions are emotional (demonstrations of love, care, sympathy, empathy, etc.), instrumental (provision of goods and/or services), and informational (provision of guidance, feedback, resources for medical assistance, etc.) social support. Each of these may have a different relationship with health, however the literature examining these constructs separately in older adults is scarce. There is still a great deal to learn about the various functions of support and how they work to lower or raise levels of distress and to facilitate or impair physical health. By specifying the functions of support in future research, we may be able to advance our understanding of the role of social relationships in health and disease.

The utility of social support as a stress buffer is contingent upon the match between the social support function provided and the coping requirement posed by the stressor (Cohen & McKay, 1984). Uncontrollable events such as harms or losses may entail social support functions that foster emotion-centered coping while controllable events such as threats or challenges may need a more problem-centered coping strategy (Cutrona & Russell, 1990). While there may be a marked need for one support function over the other, depending on the stressful event, all of the functions of support are thought to play a role in the general well-being (Cutrona & Russell, 1990).

f. Intentionality and impact

The conversation on social support often has the underlying assumption of benefit, and the intentional efforts to help someone but only a few definitions actually reference this postulation (Vaux, 1990b). Support that is not sought is often negatively perceived. It may, therefore, be beneficial to differentiate between the help that the recipient seeks out and help that is passively received (Barrera, 1986; Cutrona & Russell, 1990). Furthermore, the type of social support provided needs to match the need to be beneficial. For example, emotional support is critical in medical illness, but in cases of some illnesses involving physical limitations, instrumental support may also be necessary to compensate for the physical abilities lost and/or the financial strains that resulted from that illness. This highlights that, sometimes, a single stressful event may require multiple types of support to address the deficit created as a result of this stressor (Cutrona & Russell, 1990).

4.1.2. Social isolation

The theoretical concept of social support can be considered more mature than that of social isolation. The conception of social isolation is multidisciplinary, which may have contributed to the lack of consensus to date on its definition, scope and measurement (Courtin & Knapp, 2017). A variety of dimensions are reflected in the definitions of social isolation, which include structure (e.g. number and frequency of social ties), degree of subjectivity (isolation/loneliness), quality, function (e.g. social support and social control), engagement, duration and intentionality, and impact. A summary of the dimensions addressed in the different definitions (Appendix b) is provided in **Table 2**.

Table 2: Dimensions addressed in the definitions of social isolation.

Author, year	Presence/Quantity	Structure	Function(s)		Quality	Perceived (Loneliness)
			Social support	Other		
Weiss, 1974	✓	X	X	Social engagement	X	X
Delisle, 1988	✓	X	X	X	✓	X
Institute of Medicine (US) Division of Health Promotion and Disease Prevention, 1992	✓	X	X	X	X	X
Lien-Gieschen, 1993	✓	X	✓	X	X	X
Wenger et al., 1996	✓	X	X	X	X	X
Lubben & Gironda, 1996	✓	X	✓	X	X	✓
Schwarzer et al., 2004	✓	✓	X	X	X	✓
Machielse, 2006	✓	X	X	X	✓	X
Hawthorne, 2006	✓	X	✓	Companionship	X	✓
Gierveld et al., 2006	✓	X	X	X	✓	X
Nicholson Jr., 2009	✓	X	X	X	✓	✓
Cornwell & Waite, 2009	✓	✓	✓	Companionship	X	X
Biordi & Nicholson, 2013	✓	X	X	X	X	✓
Steptoe et al., 2013	✓	X	X	X	X	X
Dury, 2014	✓	X	X	Social engagement, belonging	✓	X
Zavaleta et al., 2014	✓	X	X	X	✓	X
Holt-Lunstad et al., 2015	✓	X	✓	X	✓	X
Alpert, 2017	✓	X	X	X	X	X
Wang et al., 2017	✓	✓	✓	X	✓	✓
Weldrick & Grenier, 2018	✓	X	X	Social engagement, belonging	✓	X

Dimensions

a. Structure

The quantitative component refers to the structural features of the individual's social network such as the number of contacts, frequency of contact, density, and diversity. The most widely used measure of network structure is network size (Brissette et al., 2000). Many definitions have confined social isolation to a loss/absence/decrease of social contact or ties. This approach is problematic given what we know about social relationships in older adults and how they may be satisfied with a smaller social circle (Bruine de Bruin et al., 2020). While an emphasis on quantity at some level is fundamental because the complete absence of social contacts necessitates social isolation, the opposite is not always true. In addition, terms that lack specificity such as 'minimal contact' may be difficult to operationalize and hence, not reflect an accurate picture of the older adult's social relationships. Finally, an individual's social ties can exist at different social spheres; at the household level (e.g. relationship with spouse), neighborhood, and/or larger community. Few definitions make a reference to the possible sources of social contact and even fewer definitions acknowledge the larger society as a potential source of more peripheral, yet relevant social ties (Granovetter, 1973).

b. Degree of subjectivity

Loneliness refers to the perception of social isolation; an inadequacy of social relationships, and is probably the one concept most invoked when social isolation is considered (Lubben & Gironda, 1996; Machielse, 2006; Schwarzer et al., 2004). It is considered as the subjective (psychologic) emotional state of the individual. Loneliness is not a necessary condition for social isolation, as both conditions can exist apart from each other (Biordi & Nicholson, 2013). Individuals may have numerous social ties and still feel lonely. Conversely, an individual may have little contact with others but not experience loneliness (Chappell & Badger, 1989). Actual and perceived social isolation are related, but not identical, both having different relationships with physical and mental health in older adults. Some definitions describe social isolation to encompass loneliness (Lubben & Gironda, 1996; Machielse, 2006; Schwarzer et al., 2004), whereas others have confined their definition to the objective state of social isolation (Alpert, 2017; Gierveld et al., 2006; Holt-Lunstad et al., 2015; Steptoe et al., 2013). Many definitions did not clearly specify this dimension (Delisle, 1988; Hawthorne, 2006; Institute of Medicine (US) Division of Health Promotion and Disease Prevention, 1992; Lien-Gieschen, 1993; Lubben & Gironda, 1996; Nicholson Jr., 2009; Weiss, 1974). Many definitions use the degree of subjectivity to differentiate between social isolation as an objective construct and loneliness as a subjective construct. However, social isolation can develop subjectively, for example, as a result of the diminished quality of social relationships.

c. Quality

Quality refers to the perceived value of someone's social relationships and has been suggested to include the quality of certain key relationships (e.g., partner), and qualitative information on all of someone's individual social contacts (e.g., rating how many of a person's contacts are friends) (Wang et al., 2017). The quality of social relationships may have more of an impact on social isolation and health than the number of ties (Pinquart & Sorensen, 2001), suggesting that a few solid relationships may be more beneficial than multiple ties of poor quality (Biordi & Nicholson, 2013). However, peripheral, less intimate ties can play a significant role in the quality of life of older adults by enhancing the benefits of

more central and stronger social ties, protecting against social isolation and loneliness (Berkman et al., 2000; Cloutier-Fisher et al., 2011; Fingerman et al., 2004). Therefore, definitions that make no reference to quality may not be operationalized into measures that capture the significance of social relationships. Finally, the quality of social relationships should be distinguished from the overall appraisal of the perceived adequacy of social relationships. The latter is not directly related to the quality of specific individual relationships (Wang et al., 2017).

d. Function

An individual's social relationships may impact his/her health and well-being in a variety of ways. Having multiple social roles may promote a sense of *predictability and control* over one's life (Thoits, 1983), which is suggested to positively impact self-care (Cohen, 1988). These social relationships provide further *social control*, which can affect the individual's health by; 1) direct influence of the person's health practices, or 2) indirectly through the regulating responsibilities that are correlated with social roles (K. S. Rook et al., 1990). Having multiple social roles can also promote *positive self-esteem and self-worth*, which, in turn, enhance one's ability to cope with stressful life situations and prevents depression (Cohen, 1988; Thoits, 1983). Social relationships offer *meaning and purpose* to one's life, which positively impacts the individual's psychological health (Thoits, 1983). Furthermore, having a *diverse self-concept*, which is a reflection of the individual's multiple social position within their network, has been proposed to influence how one perceives and reacts to negative life events(Cohen, Benjamin, et al., 2000). Additionally, one's social network can provide *social support*; psychological or material resources, that are 'intended to benefit an individual's ability to cope with stress (Cohen, 2004).

e. Engagement

Terms such as 'human interaction', 'participation in social activities' and 'engagement' social connectedness relay that contact per se may not be sufficient to for an individual to not be socially isolated. Older adults can have many social contacts, but not engage with them. For example, they may have several friends, but they are not called or visited. Situations imposed on older adults, such as physical illness/limitations, may further disconnect them from meaningful discourse with people important to them (Merchant et al., 2020).

f. Impact

Social relationships are encouraged due to the aforementioned positive functions that they can play in a person's physical and mental health. However, social relationships can also have negative consequences on health (Cohen et al., 2001; Nicholson Jr., 2009). An increase in social contact of isolated older adults may not always be health protective (Cohen et al., 2001). For example, social ties may encourage socially deviating or unhealthy behavior, present a source of conflictual interactions and stress for the individual, negatively impact a person's self-identity and respect if one is not feeling appreciated, and/or provide mismatched or unhelpful social support (Umberson et al., 2010). These negative consequences do not take away from the importance of social relationships, and underscore the potential consequences of using definitions that presume benefit of social relationships.

g. Duration and intentionality

Social isolation may be situational, resulting from recent stressful life events or circumstances (e.g. recent loss, moving to a new community) or structural aspects that have likely persisted for many years

(e.g. personality type or mental health) (Machielse, 2006). For example, some older adults may show a life-long pattern of having a small group of friends and less interest in replacing lost social ties. They may prefer solitary activities such as reading books and gardening (Cloutier-Fisher et al., 2011). Therefore, it is important to consider the dimension of intentionality when defining the concept of social isolation, and to distinguish social isolation from the positive state of aloneness or solitude. In solitude, an individual distances themselves from their social network, indicating that it is considered more of a voluntary initiative instigated by the individual, and is more often accompanied by positive feelings (Biordi & Nicholson, 2013).

For any of the above-mentioned definitions to be able to guide measurement, there needs to be a clear understanding of the scope of the concept being measured, and the dimensions encompassed within that concept. However, the intent of this discussion is not to suggest that there should be one "right" definition for social support or social isolation. The variety of dimensions used in defining the concepts of social support and social isolation is an acknowledgement of the complex nature and may suggest that the definition(s) of choice may depend on the context. And so, from a programmatic perspective, it is critical to consider the objective(s) and population of interest when choosing a definition to match the purpose of the measurement.

4.2. Measurement tools

4.2.1. Social support

Analysis of most of the existing measurement tools provide additional information on how social support and social isolation are assessed. While no single instrument needs to capture all of the dimensions of the concepts of social support or social isolation, the dimensions measured should be complete and relevant to the purpose of measurement. It is clear that the variations in the conceptualization of social support and social isolation are reflected in the operationalization of the constructs. Most of the reviewed measurement tools did not mention the definition that was used for social support or social isolation to guide their instrument development. The following section provides a broad overview of the full set of social support measurement tools that were reviewed, highlighting major findings. **Table 3** provides a more detailed summary of each measure.

Actual support

The Social Support-Resources, Social Support List-Interactions (SSL-I) (including the shorter version, (SSL12-I), Close Persons Questionnaire (CPQ), Social Support Network Inventory (SSNI), and the Social Support Measure measured actual social support. All of these tools measured the receipt of social support, however the Social Support Resources, SSNI and Social Support Measurements also had items that addressed social support provision and reciprocity. The SSL12-I used a general term, '*people*', to refer to the resources for social support, which would not be helpful in differentiating between formal and informal resources for support. In addition, the SSNI was the only measure that included some formal sources of support that the respondent can specify. The remaining tools only made reference to informal sources of support.

All of the instruments measured the three most common functions of social support, emotional, instrumental and informational social support, except for CPQ and SSNI, which did not examine

informational social support. SSL12-I, CPQ and the Social Support Measure were, however, the only tools that provided information on the internal consistency of the subscales measuring these different functions. It should also be noted that some of the measurements included assessments of other constructs such as social network composition and structure, and social integration.

Perceived support

The majority of the reviewed measurement tools examined perceived social support. Similar to the tools measuring actual social support, most of the perceived social support tools examined received social support. The Social Networks and Support Measurement Tool, Older Adult´s Perceived Social Support Scale, Perceived Social Support (PSS), Social Provisions Scale (SPS), and Index of Social Support (ISS) also included items that examined reciprocity. However, items did not necessarily specify the function of the reciprocated social support.

The Social Support-Appraisal measurement tool and the Multidimensional Social Support Questionnaire (MSSQ) examined a single function of social support; appraisal and instrumental support, respectively. The majority of the multidimensional measurement tools reported the internal consistency of the subscales for the different functions. Social Support Questionnaire (SSQ), Multidimensional Scale of Perceived Social Support (MSPSS), Social Networks and Support Measurement Tool, and Perceived Social Support (PSS) included items that did not specify any function(s) of social support (global support), and used general terms such as 'help' in some of their items while the Older Americans Resources and Services (OARS) Social Support Scale, Social Support Index, 11-item Duke Social Support Index (DSSI), and the Index of Social Support restricted their items to global support.

Actual and perceived support

The Arizona Social Support Interview Schedule, Inventory of Socially Supportive Behaviors (ISSB), Duke-UNC Functional Social Support Questionnaire (FSSQ), and the abbreviated 23-item Duke Social Support Index (DSSI) measured both actual and perceived social support. All of these mixed tools measured only received social support. The FSSQ and DSSI measured actual instrumental social support and perceived global social support. Excluding the ISSB, which did not specify the resource for social support, all of these measurements specified informal sources of social support, but did not differentiate between the different subgroups within the informal group, as neighbors, friends and/or family.

Table 3: A summary of measurement tools for social support.

measurement tool	Author, year	Number of questions	Direction	Evaluation	Function	Source(s)	Other constructs	Validation in older adults
I. Actual support								
Social Support List-Interactions (SSL-I)	Van Sonderen 1991/1993	34	Received	Actual	Emotional support (everyday and in problem situations) Instrumental Informational Esteem support	Unspecified ("people")	X	X
Social Support List-12 Interactions (SSL12-I)	Ormel et al., 1992	12	Received	Actual	Emotional support (everyday and in problem situations) Instrumental Informational Esteem support	Unspecified ("people")	X	✓
Close Persons Questionnaire (CPQ)	Stansfeld & Marmot 1992	10	Received	Actual	Emotional Instrumental Negative aspects of support	Informal- specified Kin/Non-kin/close persons* *specified by respondent	Social networks, social support adequacy	X
Social Support Network Inventory (SSNI)	Flaherty et. al, 1983	11	Received + Reciprocity	Actual	Emotional Instrumental Event-related	Formal and informal- respondent can specify "friends, family, coworkers, clergy, doctors, groups, etc., who are an important part of [his/her] life at this time"'	X	Developed in a sample that included older adults
Social Support-Resources	Vaux, 1982	8	Received Perceived	Actual	Emotional Instrumental Informational	Informal*-specified Family Friends *specified by respondent	Network structure, composition	X
The Social Support Measure	Krause & Markides, 1990	41	Received Provided	Actual	Emotional Instrumental Informational	Informal (natural support systems; "people")	Integration (assessed provision of	Developed in a sample of older adults

							the 3 contents)	
II. Perceived support								
Social Support Questionnaire	Schaefer et al., 1981	64 (Emotional) 9 (Tangible) 16 (Informational)	Received	Perceived	Emotional Instrumental Informational	Specified by respondent (for informational and emotional)	X	X
Social Support Index (SSI)	Wilcox, 1981	18	Received	Perceived	Emotional Instrumental Informational	Unspecified	X	X
Norbeck Social Support Questionnaire	Norbeck et al., 1981	9	Received	Perceived	Affect Affirmation Instrumental	Specified by respondent	Duration & frequency of contact	Validated in a sample that included older adults
Older Americans Resources and Services (OARS) Social Support Scale	Blazer et al., 1982	10	Received	Perceived	Global	Unspecified (someone)	Roles and attachment, social interaction	✓
Social Support Index	Bell et al., 1982	8	Received	Perceived	Global	Informal-differentiated Friends Relatives Significant other	X	Developed in a sample that included older adults
Social Support Questionnaire (SSQ)	Sarason et al., 1983	27	Received	Perceived	Global Emotional Appraisal Informational	Specified by respondent	X	X
Interpersonal Support Evaluation List (ISEL)	Cohen & Hoberman, 1983	40	Received	Perceived	Instrumental Appraisal Self-esteem	Unspecified	Belonging	X

Socially Supportive Behaviors (SSB)	Vaux et al, 1987	45	Received	Perceived	Emotional Instrumental Informational	Informal-differentiated Family Friends	Socializing	X
8 item Duke-UNC Functional Social Support Questionnaire	Broadhead et al., 1988	8	Received	Perceived	Confidant Emotional	Unspecified	X	Developed in a sample that included older adults
Multidimensional Scale of Perceived Social Support (MSPSS)	Zimet, 1988	12	Received	Perceived	Emotional Global	Informal- differentiated Family Friends Significant other	X	X
Mannheim Interview on Social Support (MISS)	Veiel, 1990	12	Received	Perceived	Psychological Everyday Support Instrumental Everyday Support Psychological Crisis Support Instrumental Crisis Support	Specified by respondent	X	X
(Medical Outcomes Study) MOS- Social Support Survey	Sherbourne & Stewart, 1991	19	Provided	Perceived	Emotional Instrumental Informational Affection	Unspecified ('someone')	Positive interaction	Developed in a sample that included older adults
11-item Duke Social Support Index (DSSI)	Koenig et al., 1993	11	Received	Perceived	Global	Informal -undifferentiated (Friends and family)	Social interactions (actual)	✓
Social Support-Appraisal	Vaux, 1996	23	Received	Perceived	Appraisal	Informal-differentiated Family Friends	X	X
Multidimensional Social Support Questionnaire (MSSQ)	Gangemi, 2010	34	Received	Perceived	Instrumental	Informal-differentiated Significant others Non-significant others	X	X

The 10-item Social Provisions Scale (SPS-10)	Caron, 2013	10	Received	Perceived	Emotional Informational Appraisal	Informal-undifferentiated ("friends, family members, coworkers, community members and so on")	X	X
5-item Social Provisions Scale (SPS-5)	Orpana et. al, 2019	5	Received	Perceived	Emotional Appraisal	Informal-Undifferentiated ("friends, family members, coworkers, community members and so on")	X	Developed in a sample that included older adults
Social Networks and Support Measurement Tool	Ahmed et al., 2018	28	Received Provided	Perceived	Global Emotional	Informal-differentiated Partner Family Neighbors Friends	X	Developed in a sample of older adults
Older Adult´s Perceived Social Support Scale	Nazari et al. 2020	34	Received (+1 item on provided practical support)	Perceived	Emotional Instrumental Spiritual	Informal- undifferentiated ("close people")	Negative interactions	Developed in a sample of older adults
Perceived Social Support (PSS)	Procidano & Heller, 1983	20 (Friends) 20 (Family)	Received Provided	Perceived	Global Emotional Informational	Informal-differentiated Friends Family	X	X
The Social Provisions Scale (SPS)	Cutrona & Russell, 1984	24	Received Provided (opportunity for nurturance)	Perceived	Emotional Instrumental Informational Appraisal	Informal- undifferentiated ("friends, family members, coworkers, community members and so on")	Social integration	✓
Index of Social Support (ISS)	James & Davies, 1987	9	Received + Reciprocity items (unspecified support)	Perceived	Global	Informal- undifferentiated ("Family, neighbors, friends, acquaintance")	X	X
III. Mixed								

Arizona Social Support Interview Schedule	Barrera 1980	6	Received	Actual Perceived	Instrumental Informational Appraisal	Informal-undifferentiated	Intimate interaction, social participation	X
Inventory of Socially Supportive Behaviors (ISSB)	Barrera et al. 1981	40	Received	Actual Perceived	Instrumental Informational Esteem	Unspecified (people)	X	X
Duke-UNC Functional Social Support Questionnaire (FSSQ)	George et al. 1988	35	Received	Actual (Instrumental) Perceived (Global)	Global Instrumental	Informal-undifferentiated (Family/friends)	Size of network, frequency of interaction	Developed in a sample that included older adults
23-item Duke Social Support Index (DSSI)	Koenig et al., 1993	23	Received	Actual (Instrumental) Perceived (Global)	Global Instrumental	Informal-undifferentiated (Family/friends)	Social interactions	Developed in a sample of older adults
Positive and Negative Social Exchanges (PANSE)	Newsom, 2005	24	Received	Actual Perceived	Emotional Instrumental Informational	Informal-undifferentiated ("people you know")	Companionship	Developed in a sample of older adults

Issues to consider in the choice of measurement tool

1. Actual or perceived?

Evaluating the objective existence of social support or the individual's assumption that it is or can be available if needed depends on the question being posed and the hypothesized mechanism of action. Most of the reviewed tools measure perceived social support, which is easier to measure, with ample evidence of its positive association with physical and mental health (Wilcox & Vernberg, 1983). It is important to note that global appraisal of perceived social support does not vary markedly over time, while measures of actual supportive function(s) can reflect the impact of an intervention. However, there is merit in including both enacted and perceived social support, given the lack of consensus on how they relate to one another, and/or if they have an independent relationship with health.

2. Received or provided?

The ability to reciprocate may be compromised by illness, and limitations imposed by homebound status. This may suggest that social support from informal social sources might not be sought by sicker, homebound older adults (Antonucci & Jackson, 1990). It is possible that older adults who are not able to reciprocate social support prefer to use formal support services and/or have an increasing need for them.

3. Composite or separate score?

While the majority of the reviewed tools measured two or more functions of social support, studies have combined them into a single score and did not test psychometric properties of the subscales. This limits the ability to identify unique effects of particular function(s).

4. Which supportive function(s)?

Certain content may be relevant for particular types of contexts, for example evidence shows that instrumental support may buffer financial stressors but not interpersonal stressors (Peirce et al., 1996). For some illnesses, physical limitation may require instrumental social support to replace or compensate for the loss of physical ability (Cutrona & Russell, 1990). Measurements tools that do not specify the content(s) of social support may not provide the information necessary for evaluating the support-enhancing functions provided by interventions and programs. For example, the NSP provides meals, nutrition counseling and education, as well as information on additional resources that could be of assistance to older adults. It is, therefore, important to measure both instrumental and informational support. However, measuring other functions of social support may improve the understanding of additional support needs of this population, and/or uncover important relationships between the different functions (Cutrona & Russell, 1990).

5. What is the source of social support?

According to the provider, social support can be divided into formal and informal social support. Formal social support is that obtained from outside the person's social network, by individuals and/or organizations in accordance with appropriate policies and regulations and tends to have the characteristics of regularity and stability. Informal social support is provided by the person' social network of family, friends and neighbors. There is a certain degree of complementarity between formal and informal social support, however, some functions, such as emotional support from family, cannot be replaced (Lu et al., 2020). Support from family and friends may be more valued, but they may be less knowledgeable in providing informational support on

relevant and useful aid than other resources (B. Sarason et al., 1990). Additionally, formal social support becomes increasingly important for older adults as they become increasingly dependent and/or outlive individuals in their social circle(s). For example, formal social support positively contributes to mental health especially in the absence of informal support, in those with limited and/or declining physical and cognitive functions (Muramatsu et al., 2010; Williams & Dilworth-Anderson, 2002). The content, quality and satisfaction with support can vary according to the source of support, which can influence the impact of support, and/or when the person seeks it (Antonucci, 1983). Therefore, depending on the purpose of measuring social support, inquiring about the source of support may be necessary.

4.2.2. Social isolation

There is a growing literature on the role of social relationships in the health and wellbeing of older adults. Researchers developed conceptual and methodological tools to better understand the nature of social isolation. Below is a summary of the tools identified and reviewed (**Table 4**).

Actual (objective)

The majority of the reviewed measurement tools are designed to measure objective social isolation. The most common structural aspects of the individual's social relationships that are measured are the presence and/or size of the person's network. However, Berkman-Syme Social Network Index (SNI) is the only measurement tool that solely considers the individual's network structure dimension of objective social isolation. The Interview Schedule for Social Interaction (ISSI), Lubben Social Network Scale (LSNS), the Mobility in Aging Study Social Networks and Social Support, and the Social Isolation Scale (SIS) measure the quality and the social support function of social relationships in addition to the structural dimension.

Actual and perceived (loneliness)

Two of the reviewed measurement tools combined items that assess the objective and perceived (loneliness) aspect of social isolation; the Canadian Longitudinal Study on Aging Social Isolation Index (CLSA-SII) and the 10-item Social Isolation Scale.

Table 4: A summary of measurement tools for social isolation.

Measurement tool	Author, year	Number of questions	Structure		Functions		Other dimensions	Quality	Loneliness	Validation in older adults
			Presence/ Quantity	Other structural dimensions	Social support	Other functions				
Berkman-Syme Social Network Index (SNI)	Berkman & Syme, 1979	6	✓	Sources of social contact	X	X	X	X	X	Developed in a sample that included older adults
Interview Schedule for Social Interaction (ISSI)	Henderson 1981	52	✓	X	Received emotional support	X	Perceived adequacy, acquaintanceship, friendship	✓	X	Developed in a sample that included older adults
The Lubben Social Network Scale-18	Lubben & Geronda, 2004	18	✓	Frequency of contact, sources (family, neighbors & friends)	Received global & emotional support	X	X	X	X	X
Lubben Social Network Scale (LSNS)	Lubben, 1988	10	✓	Sources of contact (family & friends)	Instrumental & emotional support (provision & receipt)	X	X	X	X	✓
Lubben Social Network Scale-6 (LSNS-6)	Lubben & Geronda, 2003	6	✓	Frequency of contact, sources (family & friends)	Global support	X	X	X	X	✓
The Social Disconnectedness Scale	Cornwell & Waite, 2009	8	✓	Frequency of contact, sources (family, neighbors & friends)	Global support	X	Social participation	X	X	✓
National Health and Aging Trends Study-social isolation measure	Pohl et al., 2017	5	✓	Sources of contact (partner, family & friends), quantity	X	X	Social participation	X	X	✓

International Mobility in Aging Study-Social Networks and Social Support Scale (IMIAS-SNSS)	Ahmed et al., 2018	28	✓	Sources of contact (partner, family, friends & friends), quantity	Includes received emotional support (actual & perceived) & provided global support (actual & perceived)	Meaning and purpose, positive self-esteem and self-worth	X	✓	X	✓
Social Isolation Scale (SIS)	Nicolson et al., 2020	6	✓	Sources (family, neighbors & friends), quantity	X	X	Intimacy, perceived adequacy	✓	X	✓
Canadian Longitudinal Study on Aging Social Isolation Index (CLSA-SII)	Wister et al. 2019	24	✓	Frequency of contact, sources (children, siblings, other relatives, neighbors & friends)	Emotional/information support, affectionate support, tangible support	X	Community participation, perceived adequacy	Positive social interactions	✓	Developed in a sample of older adults
10-item Social Isolation Scale	Ranjan & Yadav, 2019	10	✓	X	X	X	Intimacy	X	✓	X

Issues to consider in the choice of measurement tool

1. Should objective social isolation or loneliness be measured?

Examining both loneliness and social isolation can aid in the understanding of the older adult's social situation and provide new directions for effective intervention programs targeting this population. As mentioned, these two concepts are not identical, and therefore it is important that measurement tools that combine the evaluation of social isolation and loneliness have a scoring system that allows the differentiation between four groups; socially isolated and lonely, socially isolated but not lonely, lonely but not socially isolated, neither lonely nor socially isolated (Newall & Menec, 2019).

2. Should the measure evaluate availability or other structural features of social isolation?

Tools that only measure the availability and/or quantity of social relationships may not be able to accurately identify socially isolated older adults. Programs assessing social isolation in older adults would benefit from identifying the source of these social relationships, whether they are with family, friends, or a more formal environment such as that of congregate meal settings in the Nutrition Service Program.

5. Conclusions and Future Directions

There is ample evidence demonstrating the importance of social factors for the physical and mental health of older adults. However, lack of clarity and consensus on the conceptual definition(s) and scope of social support and social isolation, and consequently, the operationalization of these definitions may have contributed to the staggering progress made in understanding the nature of these concepts in this vulnerable population. Additionally, understanding the interplay between social support and social isolation in older adults can provide insights into the design of interventions that address either of these concepts, and can point toward relevant outcomes for measuring the effectiveness of these programs.

The nature of social support and social isolation depends on the context in which they are being measured, including the characteristics of the population of interest. This context goes beyond individual level factors, to include, for example, neighborhood and community level factors (e.g. transportation facilities and safety). Understanding the meaning of social support and social isolation for older adults can help refine how they are defined in the literature, and consequently, how they are measured. This is particularly important for high risk groups, such as older adults with multiple chronic diseases and/or those who are homebound, who may have a different view of social support and/or social isolation. A client-based approach such as that offered through community-based participatory research may also provide better direction of ways to deliver interventions. Furthermore, exploration of the risk factors and mechanisms through which social support and social isolation can influence health outcomes in older adults, whether and how gender, cultural and/or socioeconomic differences are at play, can offer guidance into the design of effective and better targeted interventions. It may be that effective support and social connectedness follow a dose-response relationship with health and are dependent on a certain 'degree' of deficiency. It is unlikely that a 'one size fits all' approach to interventions addressing social support and social isolation is effective. Additionally, programs aiming at providing social support and alleviating/preventing social isolation in older adults can benefit from the characterization of the relationship between the different dimensions of support (e.g. perceived and enacted support, formal and informal), and that between actual and perceived social isolation. These findings can help prioritize interventions and provide further guidance into the most cost-effective use of resources. However, many of issues have not been adequately explored in the literature, and the lack of reliable and valid measurement tools in older adults may have impeded such progress.

There is consensus that both social support and social isolation are not unitary concepts. However, most of the existing measurement tools for the two concepts attempt to combine dimensions of each concept. Furthermore, some measurement tools do not make a clear distinction between social support and social isolation. Consequently, such measurements may offer little conceptual meaning and practical application. A solid theoretical foundation is necessary for the design of the measurement tools for these two concepts. Conceptual clarification followed by construct validation are needed for each concept. Empirical construct validation through, for example, the multi-trait multi-method matrix would be helpful, given the multiplicity of existing measurement tools. In summary, more fine-grained questions need to be addressed and further development of measurement tools is necessary for programs and policies to effectively address the growing epidemic of social isolation and social support needs of the expanding and vulnerable older adult population.

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Appendices

Appendix a: Definitions of Social Support

(Author, year)	Definition(s)
(Caplan, 1974)	"Set of relationships with one or more significant others or groups that help the individual deal with the general issues of life or that provide special assistance";
	"Both enduring and short term support are likely to consist of 3 elements: the significant others help the individual mobilize the psychological resources and master his emotional burdens; they share his tasks; and they provide him with extra supplies of money, materials, tools, skills and cognitive guidance to improve his handling of his situation";
	"It is not an all-inclusive analysis of the meaning and significance of social ties and groupings"
(Cobb, 1976)	"Information leading the subject to believe that he is cared for and loved, esteemed and valued, and that he belongs to a network of communication and mutual obligation"
(Kahn, 1979)	"Interpersonal transactions that include one or more of the following: the expression of positive affect of one person towards another; the affirmation or endorsement of another person's behaviors, perceptions, or expressed views; the giving of symbolic or material aid to another. The key elements in supportive transactions are thus affect, affirmation and aid"
(Schaefer et al., 1981)	"An evaluation or appraisal of whether and to what extent an interaction, pattern of interactions, or relationship is helpful"
(Pilisuk, 1982)	"Social support refers to those relationships among people that provide not only material help and emotional assurance, but also the sense that one is a continuing object of concern on the part of other people"
(Procidano & Heller, 1983)	[Perceived] "the extent to which an individual believes that his/her needs for support, information, and feedback are fulfilled"
(Leavy, 1983)	"The availability of helping relationships and the quality of those relationships"
(Berkman, 1983)	"The emotional, instrumental, or financial aid that is obtained from the social network"

(Barrera & Ainlay, 1983)	“Behavioral transactions provided by natural social support systems' can be classified into six categories; “1) Material aid: providing tangible materials in the form of money and other physical objects; 2) Behavioral assistance: sharing of tasks through physical labor; 3) Intimate interaction: traditional nondirective counseling behaviors such as listening, expressing esteem, caring and understanding; 4) Guidance: offering advice, information or instruction; 5) Feedback: providing individuals with feedback about their behavior, thoughts or feelings; 6) Positive social interaction: engaging in social interactions for fun and relaxation”
(Shumaker & Brownell, 1984)	“An exchange of resources between 2 individual's perceived by the provider or recipient to be intended to enhance the wellbeing of the recipient”
(Thoits, 1986)	“Coping assistance, or the active participation of significant others in an individual's stress-management efforts”
(Heller et al., 1986)	[A social activity that] “is perceived by the recipients of that activity as esteem enhancing or if it involves the provision of stress-related interpersonal aid (emotional support, cognitive restructuring or instrumental aid)”
(Lin, 1986)	“The perceived or actual instrumental and/or expressive provisions supplied by the community, social networks, and confiding partners”
(Vaux, 1988)	“A metaconstruct of three distinct conceptual components: support network resources, supportive behavior and subjective appraisals of support”; “A complex transactional process involving an active interplay between a focal person and his or her support network”
(Hupcey, 1998)	“A well-intentioned action that is given willingly to a person with whom there is a personal relationship and that produced an immediate or delayed positive response in the recipient”
(Cohen et al., 2000)	“The social resources that persons perceive to be available or that are actually provided to them by nonprofessionals in the context of both formal support groups and informal helping relationships”
(Cohen, 2004)	“Refers to a social network’s provision of psychological and material resources intended to benefit an individual’s ability to cope with stress”
(Finfgeld-Connett, 2005)	“Is an advocative interpersonal process that is centered on the reciprocal exchange of information and is context specific', identifying 2 types of support; emotional and instrumental”
(Turner & Brown, 2010)	“A multidimensional concept involving perceived, structural, and received support”

Appendix b: Definitions of Social Isolation

(Author, year)	Definition(s)
(Weiss, 1974)	"The absence of an engaging social network"
(Delisle, 1988)	"Denotes a lack of quantity and quality of social contacts"
(Institute of Medicine, 1992)	"Defined structurally as the absence of social interactions, contacts, and relationships with family and friends, with neighbors on an individual level, and with "society at large" on a broader level"
(Lien-Gieschen, 1993)	[Within the elderly population] "occurs as a process in which individuals lose their sense of personal integrity or connection with resources within the society"
(Wenger et al., 1996)	"Objective state of having minimal contact with other people"
(Lubben & Gironda, 1996)	"Social networks, social support and loneliness"
(Schwarzer et al., 2004)	"Refers to the structure and quantity of social relationships, such as the size and density of networks and the frequency of interaction, but also sometimes to the subjective perception of embeddedness"
(Machielse, 2006)	"Lack of meaningful relations";
	"Adequate definition of social isolation in which not only the objective aspects but also the quality and assessment of social relationships of an individual is weighed out"
(Hawthorne, 2006)	"Defined as living without companionship, having low levels of social contact, little social support, feeling separate from others, being an outsider, isolated and suffering loneliness"
(Gierveld et al., 2006)	"Concerns the objective characteristics of a situation and refers to the absence of relationships with other people";
	"People with a very small number of meaningful ties"
(Nicholson Jr., 2009)	"A state in which the individual lacks a sense of belonging socially, lacks engagement with others, has a minimal number of social contacts and they are deficient in fulfilling and quality relationships"

(Cornwell & Waite, 2009)	[Two distinct aspects]: “Social disconnectedness; characterized by a lack of contact with others and indicated by situational factors, such as a small social network, infrequent interaction, and a lack of participation in social activities and groups, and perceived isolation; characterized by the subjective experience of a shortfall in one’s social resources such as companionship and support; 1) Lack of social network robustness and a lack of participation in social activities, 2) One’s perception of the supportiveness, closeness, adequacy, and companionship”
(Coyle & Dugan, 2012)	“Social isolation is the objective lack of relationships and social interaction”
(Biordi & Nicholson, 2013)	“Is the distancing of an individual, psychologically or physically, or both, from his or her network of desired or needed relationships with other persons"- vs. belonging or connectedness”;
	“A loss of place within one's group(s)”
(Steptoe et al., 2013)	“An objective and quantifiable reflection of reduced social network size and paucity of social contact”
(Dury, 2014)	“An individual lacking a sense of belonging, social engagement and quality relationships with others”
(Zavaleta et al., 2014)	“The inadequate quality and quantity of social relations with other people at the different levels where human interaction takes place (individual, group, community and the larger social environment)”
(Holt-Lunstad et al., 2015)	“Objective social isolation; 'Pervasive lack of social contact or communication, participation in social activities, or having a confidant”
(Alpert, 2017)	“An objective state of having minimal social contact with others”;
	“Occurs in situations when an individual has a paucity of social contacts with family, friends, and/or the wider community”
(Wang et al., 2017)	Authors “developed a model with five domains incorporating all the concepts relevant to social isolation: 1) Social network—quantity (refers to quantity of social contact; e.g., the number of people in someone’s social network, number or frequency of someone’s social contacts over a period of time); 2) Social network—structure (refers to characteristics of social contacts, not involving any appraisal of the quality of the relationship: e.g., network density (how many of the people in someone’s social network also know each other), and the characteristics of someone’s social contacts (e.g., how many are kin, colleagues, mental health staff, or mental health service users); 3) Social network—quality (refers to the perceived quality of relationships. This domain includes measures of the quality of specific important relationships (e.g., partner

	and parents). It also includes measures of qualitative information about all someone's individual social contacts (e.g., rating how many of someone's social contacts are friends, how many could be confided in, and how many would be missed); 4) Appraisal of relationships—emotional ((Emotional) refers to overall appraisal of the perceived adequacy or impact of relationships: e.g., loneliness or emotional social support. This domain does not directly relate to, and is not measured by, the number of or quality of specific individual relationships); and 5) Appraisal of relationships—resources (refers to perceived overall access to resources from someone's social relationships: e.g., tangible social support)"
(Weldrick & Grenier, 2018)	Builds on Nicholson, 2009: "(1) number of contacts; (2) belonging; (3) inadequate relationships (non-fulfilling); (4) engagement; (5) quality of network members." But adds: [A macro perspective]; "experience of social isolation as a social and cultural phenomenon' and not only as an individualized objective phenomenon"; "To include social and structural dimensions' which include: '1) duration and time, 2) place and space (community vs. institutional settings, age-friendly cities movement, rural vs. urban); 3) considerations of inequality and exclusion (Minority ethnic and language groups, LGBTQ groups"