



Definitions and Measurement of Engagement in Persons with Dementia: A Scoping Review

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ABSTRACT

Creating meaningful engagement for a person with dementia is recognized as a non-pharmacological approach to enhancing their well-being and decreasing their agitation, anxiety, and depression. However, no standard definition of engagement exists. A scoping review was conducted to examine the current definitions of engagement in persons with dementia and the measurement of engagement. The literature search was conducted using CINAHL/EBSCO and PubMed for the years 2016-2021 using the search terms "dementia AND elderly AND engagement." A screening process was developed, with articles meeting inclusion criteria independently reviewed by at least two team members. A follow-up of publications of the key authors was conducted alongside a search of the gray literature. Congruent themes of the definitions were identified, and articles were grouped into thematic categories. The two major themes of engagement definitions: were social contact/interaction and response to

activity and/or stimuli, and two minor themes, meaningful/satisfying activity and program/activity attendance, were found in the literature. The measurement of engagement reflected the two major themes of definitions reviewed and was primarily captured through observation. Major components of the three observation-based scales were similar, capturing affect, attitude, and attention in various formats and degrees. A comprehensive definition, combining key aspects of the cited definitions developed by the researchers, follows the Emotional and/or behavioral response generated by introducing stimuli through social or activity-based interactions that are meaningful to the individual and create satisfaction. The current observational approach to capture engagement is impractical for clinical use as it is subjective and time-consuming. This scoping review reveals the need for objective technology-based tools that capture the holistic concept of engagement among persons with dementia.

KEYWORDS: Engagement; Dementia; Scoping Review; Definition of Engagement; Measurement of Engagement.

KEY PRACTITIONER MESSAGE

1. Engagement of persons with dementia has implications for daily functioning, holistic well-being, positive mental health, and cognitive ability.
2. A holistic definition of engagement is important if the outcomes of being engaged are going to have a meaningful effect on the person with dementia.
3. Developing an objective and unobtrusive engagement measurement for persons with dementia is essential to be clinically applicable.

INTRODUCTION

With the growth of the aging population and the rising incidence of dementia which represents Alzheimer's disease and related dementias (ADRD), it is vital to develop solutions that positively impact the quality of life of these individuals. One solution is interventions that improve engagement in meaningful activities (Kemp et al., 2021).

Kemp et al. (2021) reported that dementia is a progressive disease that decreases a person's ability to interact with the environment and results in a loss of interest in social activities, leading to social isolation and lower quality of life. Kemp also reported that when a person with dementia is engaged in meaningful activity, it slows or reduces some of the related cognitive symptoms providing more prolonged independence and increased quality of life. Creating opportunities for meaningful engagement is a promising non-pharmacological approach to enhancing the well-being of persons with dementia and has implications for improving their cognitive and physical function (Mansbach et al., 2017; Theurer et al., 2015). The engagement has been cited as improving the quality of life of those with ADRD (Dementia Action Alliance, 2016; Fazio et al., 2018).

Determining and providing activities and social interactions that engage persons with dementia has been identified as crucial for delivering person-centered care (Jonathan, 2017). The Person-Centered Care model recognizes that when a person is engaged in a meaningful activity, he or she interacts with his or her surroundings, resulting in increased life satisfaction and quality. Consequently, it is increasingly important to understand what activities the individual finds meaningful and in what instances an individual is being engaged. Similarly, the Need Driven Model recognizes engagement as an important variable for improving quality of life (Whall & Kolanowski, 2004). Engagement has also been identified as an important outcome for various other programs implemented in long-term care settings (Gaspar & Westberg, 2020; Westberg et al., 2017).

A recent literature review was conducted by Motealleha et al. (2019) in which they identified many different definitions of engagement, including (but not limited to): level of stimulation (active or passive), level of social interaction (communication and interaction between residents), level of financial incentive (volunteer or paid work), temporal

commitment (residents visited or talked about the garden), and/or type of activities. They also found that the measurement and intervention used for each definition of engagement differed (Motealleh et al., 2019). These methodological variations make it difficult to interpret the results for researchers and limit the generalizability in clinical practice.

Engagement has been the focus of outcomes for research and clinical programs, but no standard definition exists. This paper will present a scoping review to examine the current definitions of engagement in persons with dementia and how engagement is measured. These definitions and measurement approaches will be critically assessed to determine the components of engagement captured in the current measurement tools that could be applied to an objective solution for tracking engagement.

METHOD

Scoping reviews provide an approach to reviewing research evidence without needing to answer a discrete research question (Sucharew & Macaluso, 2019). In this study, a scoping review is defined as a research synthesis aimed at identifying, classifying, and understanding the existing body of literature (Munn et al., 2018). The focus of this scoping review is to determine the clinical definitions and measurement of the concepts of engagement limited to individuals residing in assisted living or nursing homes and is guided by the question, "*What are the characteristics and components of measurements of the clinical concept of engagement for persons with dementia?*"

Eligibility Criteria

Literature included in the scoping review included items available in the CINAHL/EBSCO and PUBMED databases published between 2016 and 2020, having a population of older adults with dementia, provided a definition of engagement (clinical or theoretical), published in the English language and when providing a clinical intervention, identified a tool or measurement of engagement.

Information Sources

Published articles were obtained through systematic searches of select databases using a Midwest urban university using the library's subscription services to standard healthcare databases. Supplemental

literature was investigated using the reference list from the published literature. Grey literature was obtained through an internet search using the Google search engine.

Search Strategy

The initial literature search was conducted in the summer of 2020 by a professional health sciences research librarian. The databases selected were CINAHL/EBSCO (nursing and allied health 1946 - present) and PubMed (subscription). The search was limited to 2016–2020 using the terms “*dementia AND elderly AND engagement*.” The search query includes terms selected by the authors to capture engagement as widely as possible while still limiting to clinical applications appropriate to those with dementia. After sorting for duplicates, 93 articles were obtained and exported to Endnote (Clarivate-EndNote, Philadelphia, Pennsylvania, USA) folders for the research team to review. PDF copies of the articles were downloaded from library sources and stored on a Google Drive cloud storage (Google, Mountain View, California, USA) for future access by the team.

The reference list of the most relevant articles was reviewed for additional publications. A second search was completed in September 2020 by the researchers using the public PubMed database sponsored by the National Library of Medicine (NCBI NLM) website (<https://pubmed.ncbi.nlm.nih.gov/>) to capture the most relevant publications and authors who had sustained research focus on the engagement of persons with dementia as identified in the original literature search. The search was completed using the terms dementia, engagement, and the author’s name. A sample of articles for each author group over their publication lifetime was reviewed for definitions of engagement. As a consequence of this review, researchers were able to identify sustainability or changes in the definition over time, as well as new references that cited the author’s sources. The author names used in this search were: Camp, Cohen-Mansfield, Goodenough, Kolanowski, Kang, Jones, Perugia, Snow, and Van Beek.

A third search was manually conducted in December 2020 using standard internet browsers and Google search services (<https://www.google.com>) to identify gray literature, including consumer evidence, white papers, unpublished thesis, dissertations, blogs, and professional conference proceedings that refer to a definition of engagement. The search

term “*engagement of those with dementia*” was used to get overall results. An intentional decision was made to only screen the first 200 entries (as sorted by Google for relevance) since most of the hits were duplicates of each other or the literature already collected from the first two searches, and it was unlikely to yield a host of new articles.

In addition, a google search was conducted using the same terms for the literature search to compare the definitions in the literature with definitions on websites. This search was done on two dates in January 2021. The sites on the first two screens of the search that were not published articles were reviewed for definitions of engagement and measurement instruments.

Screening Process

A screening process was used to determine the study’s relevance for inclusion in the scoping review. All studies focused on persons with dementia were included in the initial search to gather as comprehensive a collection of articles as possible. Only articles available in full text and the English language were included due to a lack of translation resources. When the same material was found in multiple published forms or more than one publication (epub, reprint in another journal, online before print, electronic article, print article, etc.), only the most current and complete version was used.

In the first step, citations and abstracts of the collection were reviewed, and any articles that included the concept of clinical engagement (in any definition prescribed by the original author) or a measurement tool that measured any element of engagement (as defined by the original author) were retained for further screening. The analysis did not include papers that described the engagement of non-clinical elements such as community resources, political campaigns, or financial systems.

All articles were initially reviewed by graduate assistants who completed a screening form and then submitted to the researchers for review. At least two team members independently reviewed articles; many were reviewed by three. When results did not agree, the team discussed the questionable articles in regularly scheduled meetings to determine if they should be included or excluded.

Based on the data collected in the screening form, articles that did not include the population of interest, dementia populations in senior living

facilities (assisted living, nursing home, skilled care, rehabilitation, etc.), were excluded. Additionally, articles were removed if the concept of engagement was focused on engaging staff rather than patient engagement with their surroundings.

The remaining articles were downloaded as full-text and reviewed using a data collection form including author, date, definition of engagement, measurement of engagement, characteristics of the measurement, and conceptual framework. Articles were excluded at this stage if they did not present a distinct definition of engagement that provided characteristics beyond physical presence in the same general space or simple interaction with something. The review data were compiled into a single Microsoft Excel 2013 (Microsoft Corporation, Redmond, WA) spreadsheet and shared with team members via Google Drive.

RESULTS

Engagement Definitions

The literature presents a continuum of definitions of engagement ranging from simply the interaction with an item or attending an activity to a more comprehensive conceptualization that explores the meaningfulness of an interaction. Congruent themes were identified, and articles were grouped into thematic categories. The two significant engagement themes were social contact/interaction and response to activity and/or stimuli, and two minor themes, meaningful/satisfying activity and program/activity attendance, were found in the literature. [Table-1](#) demonstrates the rate of engagement types with the number of articles found in the literature for each major theme, while [Table-2](#) summarizes the definitions of engagement found in the literature for each major theme.

Table-1. Number of Literature References Reviewed in Each Theme Category

Definition Theme Category	Number of Articles Reviewed
Social contact/ interaction	9
A Response to Activity and/or Stimuli	14
Program / activity attendance	1
Meaningful/ satisfying activity	2

Social Contact/Interaction Theme

This group of literature contained a coherent set of definitions focused on social contact and interaction as the main concepts defining engagement. These definitions contained a common theme of “*being social*” and, in most instances, used the Resident Assessment Instrument-Minimum Data Set (RAI-MDS) to define and measure engagement. The RAI-MDS measurement scale is part of a clinical assessment process required for a nursing home to be certified to receive Medicare or Medicaid funding. This standardized assessment is comprehensive and intended to determine the extent of each resident’s functional capacity. In addition, a series of questions address health needs and the ability for social engagement. The definition used in the RAI-MDS characterized engagement as the ability of the resident to take the initiative to participate in the opportunities for social activities offered by the nursing home, such as playing cards, playing games, participating in group exercise, watching tv, interacting with others 1:1, interacting with other in a group, interacting with robotic animals, interacting with planned activities, etc. (Freeman et al., [2017](#); Gerritsen et al., [2008](#); Lou et al., [2013](#); Serrani Azcurra, [2012](#); Tse et al., [2018](#); van Beek et al., [2011](#); Yoon & Kim, [2017](#); Zeisel et al., [2018](#)).

Ziesel et al. ([2018](#)) offer a similar definition of an engaging activity as an activity in which participants interact in a socially acceptable manner. This definition offered by Ziesel uses the term “*engaged*” as a defining characteristic of engagement and only addresses engaging activities, not the engagement of people with dementia. This lacks clarity but does specify that engagement contains a social context with qualitative meaning.

Response to Activity and/or Stimuli Theme

This group of literature contains a coherent set of definitions that indicate engagement was a response to a specific activity and/or stimuli. There were a variety of stated definitions, but all alluded to the same central concept of response without quantification of meaning. This definition theme was used generically when the engagement was an outcome measure of a specific intervention (items or program) or a model of care. The interventions varied in range from simple stimuli of handing an individual an object to a more complex activity such as the outcome of the Montessori program. The engagement was used as a secondary characterization of the response to an intervention, not as a primary definition for

a measure. Most of the time, the focus was on an individual rather than a group. Leone et al. (2012) described engagement as being involved or occupied with external stimuli, while Bailey et al. (2017) similarly stated that engagement was engagement with materials. In associated research, Lazar et al. (2016) did not formally define engagement but produced outcomes that captured involvement and interactions with an activity. This trend continues with recent research by Lucock et al. (2020), who indicated that any physical contact or orientation to an item is engagement.

It is important to note that this theme group contains several sets of literature composed by the same authors, providing a consistent definition across literature platforms. One set of articles utilized the definition of engagement introduced by Cohen-Mansfield et al. (2009) and is still commonly used today (Kemp et al., 2021).

Being so proliferative throughout the literature, this definition has stayed relatively consistent over the years. This definition represents engagement as the duration, level of attention, and attitude of a person while involved with an external stimulus. This definition expands upon earlier definitions by highlighting the context of length and attitude as essential parts of the conceptual definition. Other writers have used this term with slight modifications (Kang, 2012; Leone et al., 2012).

Another definition of engagement commonly seen in the literature addresses the outcomes of Montessori programming. The Montessori program has been used in a variety of research and clinical activities over the years and is most cited as using four types of engagement: constructive engagement, passive engagement, non-engagement, and other engagement. Skrajner et al. (2014), and Mbakile-Mahlanza et al. (2020), use the concept of

Table-2. Definitions of Engagement and Associated Measures for Each Theme Category in the Literature

	Select Reference(s)	Definition	Associated measurement
Theme Category: Social Contact/ Interaction	Freeman et al. (2017)	Ability to take advantage of opportunities for social interaction and to initiate actions that engage in the life of the home" along with "a requirement the resident has the opportunity to engage and must take action by participating in social activities."	RAI-MDS derived Index for Social Engagement (ISE)
	Gerritsen et al. (2008)		
	Lou et al. (2013)		
	Serrani Azcurra (2012)		
	Tse et al. (2018)		
	van Beek et al. (2011)		
	Yoon, J. Y., & Kim, H. (2017)		
	Ziesel et al. (2018)	"Engaging activity" is one in which participants are engaged with each other in a socially appropriate and/or altruistic manner.	Menorah Park Engagement Scale
Theme Category: A Response to Activity and/or Stimuli	Bailey et al. (2017)	Engagement with materials	No Measurement
	Lazar et al. (2016)	The engagement was not formally defined but captured with activity involvement and interactions	No Measurement
	Leone et al. (2012)	Being involved or occupied with external stimuli	Observational Measurement of Engagement (OME)
	Lucock et al. (2020)	Used definition of engagement by Raetz et al. (2013): any physical contact with the item or orientation to the item, depending on the typical use of an item	No Measurement
	Cohen-Mansfield et al. (2009)	The act of being occupied or involved with an external stimulus and includes the dimensions of duration, attention, and attitude	The Observational Measurement of Engagement Assessment (or an adaptation of the assessment)
Cohen-Mansfield et al. (2010a), (2010b)			
Cohen-Mansfield et al. (2012)			
Kemp et al. (2021)			

engagement which involves interaction with stimuli generally located within the external environment.

Mbakile-Mahlanza et al. (2020) used the Montessori activities in a trial of dementia patients and stated that engagement involves interaction through activities. The activities were designed to engage a dementia patient's attention while promoting positive social interaction. A similar definition was presented in research by Skrajner et al. (2014) while working with dementia patients' engagement using the Montessori program, with engagement defined as the effect of providing meaningful activities to persons with dementia but not an individual's overall engagement.

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A less common but more recently cited definition of engagement surfaced from a group of articles published by a team of researchers in Australia (Jones et al., 2015; Jones et al., 2018; Moyle et al., 2017). Their definition indicates that engagement is an emotional or behavioral expression or response during or following the introduction of an activity. This moves the focus of engagement to an individual's internal focus through emotion and behavior instead of externally focused through physical touch and observation and consisted of 5 dimensions - affective, visual, verbal, behavioral, and social. This definition contains individual meaning and subjectivity. One component of the measurement tool they developed includes a social category indicating group interaction, even though the definition indicates that the activity is individually experienced.

Two other minor themes appear in the literature but are not as widely utilized as the last two groups and include: Program/activity attendance and Meaningful/Satisfying activity.

Meaningful/Satisfying Activity Theme

This literature group contains a definition of engagement that includes whether the participant found the activity meaningful or satisfying. This introduces a spectrum of satisfaction as a proxy measure for engagement and assumes that only meaningful or satisfying activities will be engaging.

Perugia, van Berkel et al. (2018) introduced a

comprehensive definition of engagement that indicates that through active involvement with an activity, an individual experiences enjoyment, a more positive mood, and becomes more captivated by the activity. In addition, Perugia, Rodriguez-Martin, et al. (2018) introduced the quantity of movement as a measure of engagement and motivation. Through this involvement, the individual is less distracted and more inclined to work harder at the activity. Eggert et al. (2015) offered a similar definition of engagement which shows that the individual is involved, and this involvement was triggered by a meaningful activity and created outcomes for the participant that included being more energetic and in a positive mood. This definition is very subjective as it relies on self-report of meaning and assumes individuals have the mental capacity for analytic thought and self-awareness, although these characteristics may not be present in individuals who suffer from dementia.

Program/Activity Attendance Theme

This theme contains the simplest definition of engagement as *an individual's attendance at a program or activity*. Attendance is recorded, and engagement is assumed regardless of the content of the activity or level of interaction. There is no context of interaction with objects, people, or even attention to the activity. One study used this approach when Tak et al. (2015) looked at activity engagement in nursing home residents with dementia and measured engagement as an individual attending an activity. This categorization is mainly used when reporting on the effect of a program or activity being offered.

Measurement of Engagement

The measurement of engagement varied across a continuum similar to the definitions. The most straightforward measurement tool determined if an individual attended an activity, while most measurement scales required subjective researcher observation of the individual during a response to a stimulus or activity. One approach used technology instead of researcher observation.

Five tools were identified in the literature that capture engagement through observation: 1) Engagement of a Person with Dementia Scale (EPWDS); 2) Menorah Park Engagement Scale (MPES); 3) Observational Measurement of Engagement Scale (OMES); 4) RAI-MDS Derived Index for Social Engagement (ISE) and 5) RISE - Revised RAI-ISE scale.

Components of the Measurement Scales

The various components of engagement captured in the observational measurement scales were categorized as a type of interaction/involvement observed, and responsive aspects are outlined in [Table-3](#).

All five scales capture the interaction with others and/or activities to varying degrees. The types of interaction or involvement category components were primarily captured in the RAI-MDS Index for Social Engagement (ISE) and its revised version, the RISE. Social interaction is the focus of the items on this scale, including interaction with others and involvement with activities, but it is only a record of the interaction or involvement in the activity. It does not include the resident's response except for the one question, "positive response to others," on the RISE. The focus on social engagement differentiates this measure from the other measures reported in the literature.

The other three scales (EPWDS, MPES, and OME) capture engagement through observation and determine engagement for a variety of activities based on how responsive an individual is to a stimulus or activity. The components of the response captured are duration, attention, affect, and attitude and are used when a resident is participating in a psychosocial activity. It is important to note that even though the definition of engagement proposed by the developer of the EPWDS is "a response to an activity," the response incorporates two questions on social interaction in this measure. The MPES was developed to accompany the Montessori-based Dementia Program. The OME is based on response to a stimulus - generally the presentation of an item but was used by some authors to capture a more complex activity.

Duration is captured on two of the scales. The MPES has the observer code for each type of engagement observed (constructive, passive, etc.) into three categories (never seen,

Table-3. Components of Engagement in Observational Measurement Scales found in the Literature

	Types of interaction or involvement observed					Responsive Aspects of the observation captured				Types of engagement	Other components	Scoring
	Interaction with others	Involvement in facility activities	Involvement in/with planned or structured activities	Involvement in self-initiated activities	Varies based on target activity	Affective state	Duration	Attention	Attitude			
Engagement of a Person with Dementia Scale (Jones, Sung & Moyle, 2015)	Yes	No	No	No	Psycho-social activity	Yes	No	Yes	No	Affective Visual Verbal	Environment appropriate	Total score
Menorah Park Engagement Scale (Judge, Camp & Orsull-Jeras, 2000)	No	No	No	No	Yes	Yes	Yes	Yes	No	Social Constructive Passive Non-engagemen-ther engagement Refusing and/or leaving an activity	Helped others Acted in-appropriately	Duration of each type of engagement
Observational Measurement of Engagement Assessment (Cohen-Mansfield, Dakheel-Ali & Marx, 2009)	No	No	Yes	No	Yes		Yes	Yes	Yes	No	No	No
RAI-MDS derived Index for Social Engagement (ISE) (Hawes et al., 1997)	Yes	Yes	Yes	Yes	No	No	No	No	No	No	Establishes own goals	0-6
RISE – revised RAI ISE (Gerritsen et al., 2008)	Yes	Yes	Yes	No	No	No	No	No	Positive response to others	No	Initiates interaction with others	0-6

seen less than ½ of the observation period, or greater than ½ of the period). Duration is captured on the OME in the amount of time engaged, with the time in seconds or minutes, depending on the study.

All three observation tools include attention level as a component, yet they use different coding systems. The EPWDS categorizes attention by visual, verbal, or behavioral attention, while the OBS codes attention into the categories of not attentive, somewhat attentive, or very attentive. The MPES classifies engagement based on attentiveness (constructive, passive, non-engaged, and refused).

All instruments ask the observer to capture the attitude and/or affect. The EPWDS captures affect as either positive or negative. The MPES includes affects as either pleasure, anxiety, or sadness. Attitude is coded on a five-point scale on the OME, ranging from very negative to very positive.

The literature also offered a technology approach to capture engagement that did not use a standard measurement scale. A recent study investigated the use of a wrist-worn accelerometer to capture engagement (Perugia, Rodríguez-Martín et al., 2018). The researchers found a significant correlation between the quantity of movement gauged with the accelerometer and the observed engagement of individuals with dementia during two activities (Perugia, Rodríguez-Martín et al., 2018). They also found that apathy and depression significantly negatively impact an individual's engagement (Perugia, Rodríguez-Martín et al., 2018). This measured gross movement of participants without concern for the quality of sensor signal or differentiation of fine motor movements.

Results of Grey Literature

The results of the google search of current websites that appeared using the key terms engagement and dementia provided a variety of sites. The sites represented key organizations that provide resources for persons with dementia or care for those individuals. Although all the sites noted the importance of engagement for those with dementia, none offered additional information about an engagement definition.

DISCUSSION

This scoping review was conducted to describe the current definitions and measures for engagement

among persons living with dementia. Engagement is an important concept for this population that is noted to influence their quality of life, yet it lacks a clear meaning and a variety of measures. These challenges are supported by Nazir (2021) in a webinar by the National Academies of Sciences, as he cites that problems focusing on improving the quality of care for nursing home residents are related to a lack of real-time data analytics and irrelevant metrics to measure resident status and outcomes. He continues that one pathway to enhancing the life quality of nursing home residents is to properly define the concepts and characteristics of resident populations to build appropriate measures and methods. Additionally, the National Academies of Science released an article outlining the imperative to address nursing home quality, including the engagement of residents, staff, and families (National Academies of Sciences, 2022).

Overview of Engagement

This scoping review of the engagement of persons living with dementia has identified a variety of definitions and measures of engagement. Two major engagement definitions were found in the literature: social contact/interaction and response to activity and/or stimuli, and two minor themes; meaningful/enjoyable activity and program/activity attendance. Social interaction was identified as a major theme of engagement in the definitions reviewed and primarily related to the readily available measurement data from the RAI-MDS with the social engagement subscale.

Overall, definitions that reflected the response/interaction to the activity theme were related to the purpose of the research - which was testing an intervention with engagement as an outcome. For example, in research that used the robot dog as an interactive activity, the definition of engagement was focused on interaction with the object. Research that defined engagement as a response to something typically looked at as a response to select aspects of a program, such as Montessori Inspired Lifestyle (Gaspar & Westberg, 2020). Definitions that included characteristics of meaningfulness and satisfaction provided the most holistic perspective of engagement by characterizing the emotions behind the words. Conversely, the characteristic of attendance at an activity, although commonly used in clinical situations, appears less prevalent in the research literature and lacks any of the specific characteristics explaining engagement.

The grey literature identifies the concept of engagement as critically relevant to produce positive outcomes, but there is no unified definition or measurement tool. The idea of engagement was presumed to be understood by the reader and not characterized in the grey literature.

Measurement of Engagement

The measurement of engagement reflected the two major themes of the definitions reviewed, social interactions and response to an activity/stimulus, which were captured through observation. As noted previously, the social engagement subscale of the RAI-MDS was the most frequently used measure as it exists on an established database. Staff members must complete this scale based on their observations over seven days, then summarize it on the scale.

The major components of the three observation-based scales, EPWDS, MPE, and OME, were similar in capturing affect, attitude, and attention in some formats and to various degrees; however, all three measures have limited focus on social interaction. The observation was focused on the response of the participant/subject to a specific activity to determine the meaningfulness of the activity for the individual (Jones et al., 2018), not to measure a unified definition of engagement. The research team conducted these observations, which were episodic and stimuli based.

Another aspect important to consider for research and clinical application unrelated to the engagement components captured on the measurement tools is the scoring. Two measures, the EPWDS and ISE, calculate a total engagement score. This contrasts with the MPES, which measures the duration of each type of engagement but does not produce a composite score for comparison. The five aspects of engagement measured in the OBS each have a distinct measuring unit, again not allowing for a total score that could be used to characterize a unified definition of engagement. A measure of an individual's overall engagement cannot be captured in the latter two scales. The scoring, even if a total score is calculated, only represents that level for the select period of observation time and does not capture the overall engagement. Perugia, Rodríguez-Martín, et al. (2018) reported a high correlation of the movement captured by a technology wristband tool with the activity in which the person was participating. This study provides insight into the possibility of these types of tools being able to offer greater insight into

the measurement of engagement in all populations by providing standardized, objective data to classify levels of engagement. Such tools would need to be designed to measure engagement characteristics defined by movement, location, and proximity. If a device can capture engagement activities through movement, location, and proximity, then the defined characteristics of engagement could be estimated more accurately.

Recommendations

There is a need to incorporate the critical aspects and characteristics of various definitions relevant to an outcome of enhanced quality of life for persons with dementia to achieve one coherent definition of engagement. These characteristics include emotional or behavioral expression or response during or following the introduction of the activity or social interaction and provide for satisfaction and/or meaning. With the inclusion of all these characteristics, the definition will capture the dimensions of engagement in multiple settings and holistically define the actions of the individual. By combining key aspects of the existing definitions, the researchers of this review suggest a comprehensive definition for engagement of individuals with dementia as *“emotional and behavioral responses generated by the introduction of stimuli through social or activity-based interactions that are meaningful to the individual and create satisfaction.”* This definition could be either positive or negative, but ideally, interventions should be designed to produce positive emotional/behavioral outcomes.

Current measurement tools do not capture all the characteristics of the unified engagement definition proposed by the researchers. A tool needs to be developed that captures a variety of characteristic data points to measure all the aspects of engagement, not just items of interest to a specific researcher. One solution to the measurement issues related to engagement is the development of a technology-based approach. The technology must be an objective measure that captures the data passively without interfering with daily activity. In addition to movement, wearable technology can easily capture time and proximity to inanimate objects and other people. Aspects captured through technology provide the foundation for a proxy measure of engagement that can be further enhanced with component and composite scoring, 24/7 measurement, and other features such as capturing voice responses and automatic measurement of the duration of activity interactions.

From a clinical perspective, capturing the engagement of a person with dementia is important. Staff members must determine stimuli that will engage an individual to provide individualized care. These stimuli captured in a resident's plan of care can be used to improve well-being and alleviate common neuropsychiatric symptoms that are detrimental to the individual, family, and staff. An engagement metric would capture changes in the level of engagement of a resident over time, informing staff and family. The level of engagement captured has the potential to serve as a proxy for quality of life, especially for those with dementia who cannot express their perception of meaningfulness. There would also be an opportunity to use the engagement metric as part of the evaluation plan of programs contributing to the cost analysis

Strengths and Limitations of this Scoping Review

This scoping review focused on the definition of engagement for persons living with dementia. The focus helped define the key terms used and guided the literature review, so articles that did not include "dementia" as a key term were not part of the review, thus potentially eliminating definitions that would have been relevant. Limitations in finding all the relevant literature to review stem from limited subscriptions to search databases, limitation on access to full texts of articles, and a lack of critical appraisal of each article's scientific strength and research rigor that would have been completed in a meta-analysis paper. A strength of the scoping review allowed grey literature and other non-traditional sources to be investigated to enhance the pool of sources to gather information. There is a lack of research on the clinical application of engagement measurement tools; for example, the RIA-MDS is included in the scoping review but focuses on residents of nursing homes who do not necessarily have a diagnosis of dementia.

CONCLUSION

Accurately measuring the engagement of a person with dementia and determining those activities and interactions that are engaging is beneficial for stakeholders to promote resident-centered care and enhanced quality of life. One problem is that there is currently no objective, automated, and simple way to measure engagement. The most recognized measurement scales to capture engagement use

observation. These observations are generally focused on the testing of an intervention and are not clinically feasible. The subjective nature of observation and the time-consuming nature of this activity make it impractical for longitudinal measurement of clinical engagement. The use of technology to capture engagement is a promising approach that would create clinical applicability to the use of engagement to facilitate the planning of activities individually, and the use of engagement as an outcome.

One must define and characterize how engagement has been used clinically in the area of dementia research before a technology-based measurement tool can be created. For example, does engagement mean one is present at an activity or that one has participated in said activity? Should engagement measurements require the physical touch of an item (such as a pet or toy) or just the presence in the proximity of the item?

Providing persons with dementia opportunities to engage in activities is important for their well-being, as reported in the research and gray literature. However, the literature has varied definitions of engagement for persons with dementia. A comprehensive definition combining the key aspects of the definitions in the literature proposed by the researchers is "*emotional and behavioral responses generated by the introduction of stimuli through social or activity-based interactions that are meaningful to the individual and create satisfaction.*"

This proposed definition may provide the basis for the future development of new measurement methods to better capture engagement in people with dementia and stimulate the development of a technology-based measurement solution.

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