Measurement of aggression in older adults

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Abstract

Aggressive behaviors are prevalent in late-life and are associated with important consequences for older adults, caregivers, and healthcare providers. Age-related changes in the manifestation of aggression are precipitated in part by the rise of cognitive impairment. Such changes necessitate the use of psychometrically sound measures. The present article identifies existing measures of aggression for older adults, highlights the strengths and limitations of these measures, and proposes avenues for future research in this area. Five full-scale measures of aggression, as well as five subscales of aggression embedded within larger non-aggression measures in older adults were identified. Overall, measures of aggression specific to late-life are predominately observational and limited to individuals with dementia or older adults living in long-term care settings. The psychometric properties of aggression scales in late-life generally indicate adequate internal consistency, interrater reliability, and concurrent validity. In contrast, the reliability and validity of subscales of aggression contained within larger neuropsychiatric measures are more difficult to ascertain due to limited research. Future investigations would benefit from examining the psychometric properties of widely-used self-report measures of aggression among older adults, further evaluating the psychometric properties of aggression subscales, and developing additional measures which are predictive of aggressive behaviors.

Keywords

1. Introduction

Aggressive behavior is prevalent and problematic in late-life. Like other prevalent and problematic behaviors, empirical investigation is crucial to build knowledge and potentially develop effective interventions. A critical step in investigating any behavior is the accurate measurement of that behavior. This manuscript reviews the existing measures of aggression in older adults.

Aggressive behavior can vary greatly over the course of an individual's life (Liu, Lewis, & Evans, 2013). As individuals reach life milestones (e.g., driving a car, getting married, having kids), there are additional opportunities for aggressive behavior to manifest (e.g.,

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road rage, child abuse, sexual abuse, and domestic violence). The prevalence of aggression in late-life is difficult to quantify due to underreporting and varying definitions of the behavior (Jackson and Mallory, 2009). Nevertheless, environmental and medical factors are known to predis-pose older adults to aggression. At least 20% of nursing home residents report having been the victim of aggression by another resident in the past month (Lachs et al., 2016).

By age 65, up to 1–2% of individuals meet criteria for a mild or major neurocognitive disorder, and by age 85, that number increases to as high as 30% (American Psychiatric Association, 2013). Cognitive and personality changes associated with dementia can further increase an individual's disposition towards aggression (Liu et al., 2013). Individuals with dementia are five times more likely than healthy controls to display aggressive behavior (Yu et al., 2019). Over the course of the disease, 96% of patients with dementia display severe aggressive behavior on at least one occasion (Keene et al., 1999). Aggression in older adults with dementia is often characterized as resistance to care or agitation and commonly occurs in the context of personal care activities or pain (Zeller et al., 2009). Among healthy older adults, aggression can also come in the form of indirect aggression, or aggressive behavior carried out while the aggressor attempts to avoid direct confrontation (Walker et al., 2000).

Late-life aggression is not benign, it carries pertinent consequences for older adults, healthcare providers, and caregivers. Physical violence poses a significant health risk for older adults due to the age-related declines in bone and muscle mass (Walker and Richardson, 1998). Indirect forms of aggression in late-life may result in damaged relationships and withdrawal of social support (Walker et al., 2000; Walker and Richardson, 1998), both of which are commonly considered protective factors for a host of late-life functions. Providers working with older adults in healthcare settings often report experiencing direct and indirect threats, verbal aggression, and physical violence all of which contribute to burnout (Josefsson and Ryhammar, 2010; Mullan and Badger, 2007; Pitfield et al., 2011). Finally, among caregivers, verbal and physical aggression perpetuated by older adults increases caregiver burden and is associated with nursing home placement (Wharton and Ford, 2014).

Accurate measurement of aggressive behavior in older adults is necessary to inform treatment and policy decisions. Older adults differ from their younger peers in terms of physical functioning, medical comorbidities, predisposing life experiences, extensiveness of social support networks, and prevalence of cognitive changes, all of which could affect an individual's risk for and expression of aggression. Therefore, in order to adequately address aggression in late-life, it is imperative to determine whether existing measures are reliable and valid for use with older adults.

2. Methodologies for assessing aggression

Several methodologies exist for assessing aggression including interview, observational, laboratory, projective, and self-report measures. Each of these methods has unique limitations such as the impact of social desirability and cognitive functioning on an individual's self-report or the influence of observer training (or lack thereof) on

observational methods (Suris et al., 2004). While not always feasible, it may be necessary to utilize multiple types of assessments to fully assess the wide range of aggressive behavior. When considering whether a given measure of aggression is appropriate for use in an older adult population, it is important to consider whether the behavior(s) of interest fall under state or trait aggression, as this consideration can have an impact on treatment recommendations. Instruments aimed at measuring an individual's stable, characteristic behaviors are considered trait measures, whereas instruments aimed at measuring an individual's behaviors at a particular time are state measures.

3. Aggression measures commonly used for older adults

Five measures were identified as being routinely used to assess aggression among older adults. These measures are outlined in Table 1 and described below.

3.1. Aggressive Behavior Risk Assessment Tool for Long-Term Care

The Aggressive Behavior Risk Assessment Tool for Long-Term Care (ABRAT-L) is a newly developed 6-item measure designed for nursing staff to identify potentially aggressive patients in long-term care settings (Kim et al., 2017). A weighted total score ranges from 0 to 8, with scores 4 or above indicating high risk for aggression/violence. Items on the scale pertain to factors associated with increased likelihood of aggression such as cognitive impairment, anxiety, and increased age.

Using a retrospective cohort design, the ABRAT-L showed a 56.60% sensitivity and 90.80% specificity in predicting aggression among a geriatric sample of newly admitted long-term care patients (Kim et al., 2017). These results were replicated in a recent prospective study which found that the measure could correctly identify more than half of the aggressive residents and over nine out of ten non-aggressive residents (Kim et al., 2019).

3.2. Aggressive Behavior Scale

The Aggressive Behavior Scale (ABS) is a 4-item observational measure designed to assess verbal and physical abuse, socially inappropriate behavior, and resistance to care among older adults (Perlman and Hirdes, 2008). Aggressive behaviors are assessed over a seven-day period on a scale ranging from 0 (*not exhibited*) to 3 (*behavior occurred daily*). Total scores range from 0 to 12, with higher scores indicating a greater frequency of aggressive behaviors.

Cronbach's alpha for the ABS ranges from 0.79 to 0.93 depending on the institutional setting (Perlman and Hirdes, 2008). The ABS was found to be highly correlated with the aggression subscale of the Cohen-Mansfield Agitation Inventory (CMAI; $r = 0.72$, $p < .001$) suggesting adequate concurrent validity (Perlman and Hirdes, 2008). Moreover, consistent with previous research (Ryden et al., 1991), higher scores on the ABS were also correlated with impaired cognitive ability.

3.3. Modified Overt Aggression Scale

The Modified Overt Aggression Scale (MOAS) is an observational measure of aggression adapted from the Overt Aggression Scale (OAS; Coccaro et al., 1991; Yudofsky et al., 1986). While the scale was developed to capture aggressive behaviors among adult inpatient psychiatric patients, it has since been used with older adults, as well as with patients with dementia (e.g., Lanza, 2016; Margari et al., 2012). The measure consists of four items capturing verbal aggression, aggression against property, self-aggression, and physical aggression. Items are rated on a 5-point Likert scale from 0 to 4 with varying anchor points. A total weighted score ranges from 0 to 40. Despite use of the scale to assess aggression in late-life, the psychometric properties of the MOAS have not been explicitly evaluated among either healthy older adult samples or individuals with dementia.

3.4. The Rating Scale for Aggressive Behaviour in the Elderly

The Rating Scale for Aggressive Behaviour in the Elderly (RAGE) was one of the first observational measures developed to assess aggression in institutionalized older adults (Patel and Hope, 1992). The measure is designed to be completed by nursing staff and assesses the presence of verbal aggression, agitation, and physical aggression over a three-day period. Total scores range from 0 to 61, with higher scores indicating a greater frequency of aggressive behavior. All but one of the 21 items are rated on a 5-point Likert scale.

The scale's internal consistency is adequate with a reported Cronbach's alpha of 0.89 (Patel and Hope, 1992). Interrater reliability of the total score was high ($r = 0.94$) when a checklist was used as an additional source of information when completing the scale; however, this correlation was only 0.54 without the use of a checklist. Test-retest reliability was also high, with a Pearson-correlation of 0.91, 0.84, and 0.88 for six-hour, seven-day, and fourteen-day reassessments. In the initial assessment of the scale's validity, total scores on the RAGE were found to be highly correlated with the total number of recorded observations of aggressive behavior by staff ($r = 0.86$, $p < .001$; Patel and Hope, 1992). Additional research has since shown that the scale is highly correlated with both the CMAI ($rho = 0.73$, $p = .005$) and Brief Agitation Rating Scale ($rho = 0.72$, $p < .001$; Shah et al., 1998). Regarding the factor structure, a primary factor analysis of the scale revealed three factors which accounted for over 56% of the total variance: verbal aggression, physical aggression, and anti-social behavior.

3.5. Ryden Aggression Scale

The Ryden Aggression Scale (RAS) was designed to assess aggressive behavior in community-dwelling older adults with dementia (Ryden, 1988). The measure attempts to capture aggressive behavior over the past year and consists of 25 items. Items are rated on a 6-point scale from 0 (*never*) to 5 (*one or more times daily*). Total scores range from 0 to 125 with higher scores indicating greater levels of aggressive behavior. The scale consists of three subscales: physical aggressive behavior, verbal aggression, and sexual aggression. The RAS was adapted to form the RAS2 which is designed as a concurrent measure of 26 aggressive behaviors over the past day (Ryden et al., 1991). Total scores on the RAS2 are determined by the total number of documented aggressive behaviors.

Internal consistency for the RAS is adequate with a Cronbach's alpha of 0.88 for the overall scale and 0.84, 0.90, 0.74 for the physical, verbal, and sexual aggression subscales respectively (Ryden, 1988). Test-retest reliability after an 8 to 12-week interval was 0.86 and interrater reliability is 0.88. Empirical examinations regarding the validity of the RAS are limited, with content validity for the scale being established by five expert nurses (Ryden, 1988). The RAS and RAS2 are positively correlated ($r = 0.65$, $p < .001$), indicating adequate convergent validity (Ryden et al., 1991).

4. Measures with aggression subscales used for older adults

Five measures were identified as having subscales which assess aggression in late-life, as well as other neuropsychiatric symptoms. Each measure is outlined in Table 2 and described below.

4.1. Cohen-Mansfield Agitation Inventory

The Cohen-Mansfield Agitation Inventory (CMAI) is a 29-item measure used to assess the frequency of agitated behaviors in older adults (Cohen-Mansfield, 1991). The frequency of each agitated behavior is assessed over a two-week period and rated on a scale from 1 (*never performs the behavior*) to 7 (*performs the behavior several times an hour*). While total scores range from 29 to 203, developers of the CMAI caution against interpreting the overall score without careful consideration of each subscale. The measure contains an aggression subscale, which is sometimes further split into physical and verbal aggressiveness (Rabinowitz et al., 2005). The aggression subscale contains 14 items which are summed to achieve a subscale score ranging from 14 to 98, with higher scores indicating greater aggressive behaviors.

The internal consistency of the overall CMAI and aggression subscale is adequate, with Cronbach's alpha ranging between 0.83 and 0.92 (Finkel et al., 1992; Shah et al., 1998) and between 0.81 and 0.83 (Rabinowitz et al., 2005), respectively. The full-scale CMAI showed small to moderate associations with Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD) for evening ($r = 0.28$, $p = .04$) and day shifts ($r = 0.43$, $p = .003$; Finkel et al., 1992). Similarly, moderate associations were found between the full-scale CMAI and Behavioral Syndromes Scale for Dementia (BSSD) for day ($r = 0.52$, $p < .001$) and evening shifts ($r = 0.40$, $p = .005$). These findings suggest that the CMAI may be better able to capture agitated and aggressive behavior which occur during the day, perhaps because staff have more opportunities to observe patient behaviors during daytime hours. Finally, the CMAI was significantly associated with both the RAGE ($rho = 0.73$, $p = .005$) and the Brief Agitation Rating Scale ($rho = 0.84$, $p < .001$; Shah et al., 1998). Collectively, these findings suggest that the CMAI has good concurrent validity with other measures of aggression.

4.2. Disruptive Behavior Rating Scales

The Disruptive Behavior Rating Scales (DBRS) is a 4-item measure used to assess the severity of disruptive behaviors in patients with dementia (Mungas et al., 1989). The Disruptive Behavior Checklist is a daily behavior checklist designed to provide information

in determining DBRS severity ratings by identifying the occurrence of 21 behaviors. At the end of a one-week period, the rater uses all information available from the Disruptive Behavior Checklist, medical records, and staff reports, to rate the severity of disruptive behavior across four categories: physical aggression, verbal aggression, agitation, and wandering. Each behavior is rated on a scale from 0 (*insufficient data*) to 5 (*behavior occurs and has a severe effect*). A total score is derived by averaging the four category scores and ranges from 0 to 5, with higher scores indicating greater severity of disruptive behavior.

Interrater reliability coefficients ranged between 0.90 and 0.93 for the overall scale, between 0.91 and 0.92 for the physical aggression subscale, and were 0.83 for the verbal aggression subscale, suggesting adequate reliability (Mungas et al., 1989). Evidence of concurrent validity was obtained via nurses' independent assessments of patients' behavior. Physical aggression was moderately associated with nurses' assessment of severity ($r = 0.69$, $p < .01$) and distress ratings ($r = 0.82$, $p < .001$) of disruptive behavior. In contrast, verbal aggression was moderately associated with distress ratings of disruptive behavior ($r = 0.65$, $p < .01$) but not severity ratings ($r = 0.38$, $p > .05$).

4.3. Pittsburgh Agitation Scale

The Pittsburgh Agitation Scale (PAS) is a 4-item observational scale designed to assess the severity of agitation across four behavioral dimensions: vocalization, motor agitation, aggressiveness, and resistance to care (Rosen et al., 1994). The period of observation ranges from 1 to 8 h with each dimension rated using a single item ranging from 0 to 4 with higher scores indicating greater agitation. Anchor points are included in the scale to assist the observer with selecting the appropriate rating. Scores on each dimension are summed to produce a total score ranging from 0 to 16.

The ICC was 0.82 for patients on an inpatient geropsychiatry unit and 0.93 for patients in a nursing home, indicating excellent reliability (Rosen et al., 1994). By contrast, the ICC for the aggressiveness subscale was 0.63 in the inpatient unit and 1.00 in the nursing home, suggesting good and excellent reliability, respectively. Total PAS scores were lower when interventions were used to reduce agitation compared to when no interventions were used, $p < .001$. Additionally, total PAS scores were also significantly correlated with ratings from an observer using real-time microcomputer monitoring for aggressiveness ($r = 0.89$, $p < .001$) suggesting adequate concurrent validity (Rosen et al., 1994).

4.4. Behavioral pathology in Alzheimer's Disease Rating Scale

The Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD) is a 25-item scale that assesses behavioral disturbances in Alzheimer's patients across seven categories including aggressiveness (Reisberg et al., 1987). The aggressiveness subscale consists of three items assessing verbal and physical aggression, as well as agitation on a four-point scale from 0 to 4 with varying anchor points. Item scores are summed to provide a total score ranging from 0 to 75, with higher scores indicating greater behavioral issues.

There was 90% agreement among raters for all 25 items of the BEHAVE-AD scale in the original validation study. Examining individual items, internal reliability measured via Cohen's kappa for twenty of the items ranged from 0.62 to 1.00, suggesting good to

excellent reliability. Five items had fair reliability with kappa statistics ranging from 0.43 to 0.60 (Patterson et al., 1990). Further evidence of reliability was derived from ICC statistics. The coefficients for rater agreement and rater consistency were 0.96 ($p < .01$), indicating excellent reliability for the BEHAVE-AD. Coefficients for the aggressiveness subscale were 0.86 ($p < .01$) for rater consistency and 0.85 ($p < .01$) for rater agreement, suggesting excellent reliability (Sclan et al., 1996). Evidence of construct validity is supported through the measure's ability to detect neuropsychiatric symptoms separately from the cognitive and functional symptoms associated with Alzheimer's disease (Reisberg et al., 1989, 1992).

4.5. The Nursing Home Behavior Problem Scale

The Nursing Home Behavior Problem Scale (NHBPS) is a 29-item scale designed to measure behavior problems that occur and are associated with the use of antipsychotic drugs or physical restraints in nursing homes (Ray et al., 1992). The frequency of behaviors in the past three days are rated on a scale from 0 (*Never*) to 4 (*Always*). Individual item scores are summed to derive a total score ranging from 0 to 116, with higher scores indicating a greater frequency of behavioral problems. The Uncooperative or Aggressive behavior subscale is one of six subscales included in the NHBPS and includes eight items. Items pertain to resistance to care, physical aggression, and verbal aggressiveness.

Interrater reliability for the overall measure ranged between 0.75 and 0.83, while interrater reliability for the uncooperative or aggressive behavior subscale was 0.76 (Ray et al., 1992). The NHBPS was correlated with the Nurse Oriented Scale for Inpatient Evaluation (NOISE; $r = -0.75$) and the CMAI ($r = 0.91$) suggesting adequate concurrent validity. The uncooperative or aggressive behavior subscale was also associated with both the NOISE ($r = -0.71$) and CMAI ($r = -0.85$). Increased NHBPS scores were associated with sedative drug use, physical restraint, and mental impairment providing evidence of criterion validity (Ray et al., 1992).

5. Discussion and future directions

Aggression in late-life is a prevalent, but understudied, phenomenon associated with a range of adverse outcomes. The present review identified five measures, as well as five subscales of larger measures, which have been used to assess aggression in this population. Existing scales of aggression in older adults vary widely with respect to the aspects of aggression being measured, the source of information used to gather the information, and the time period assessed. Careful consideration of these factors, as well as an understanding of each scale's psychometric properties are warranted prior to measure selection. For example, clinicians or researchers who wish to predict future aggressive behavior may benefit from using the ABRAT-L. By contrast, those wishing to assess ongoing aggressive behavior among older adults with co-occurring mental health conditions may consider using the MOAS or the RAGE scales, while aggression among individuals with dementia may best be assessed by a scale designed for this specific patient population, such as the CMAI or the BEHAVE-AD. The selection of a measurement tool should be context-specific, as no single measure of aggression appears to be significantly superior in its ability to adequately assess aggression in late-life.

Overall, the psychometric properties of the reviewed aggression scales are somewhat limited with several measures lacking key indicators of reliability and validity. Nevertheless, existing data suggest that most scales have adequate internal consistency, as well as appropriate levels of interrater reliability and concurrent validity. The psychometric properties of scales assessing neuropsychiatric symptoms have been the subject of prior reviews and appear adequate (e.g., Gitlin et al., 2014), however, the reliability and validity of the aggression subscales within these measures are more difficult to ascertain given the current lack of empirical data.

Several factors may nevertheless influence measure selection. For example, while the ABRAT-L currently stands as the only scale designed to prospectively predict aggression in long-term care patients, the scale's sensitivity remains fairly low suggesting that the scale will fail to correctly identity a significant portion of aggressive patients. Similarly, although both the MOAS and the RAGE were designed to assess patients with mental health conditions, only the RAGE scale has been psychometrically examined in an older adult sample. Finally, while the measures designed to assess neurocognitive symptoms of dementia have been subject to more thorough psychometric evaluations, the CMAI remains one of the most widely used measures, contains the most aggression-related items, and has some of the strongest empirical support for its aggression subscale.

Collectively, measures of aggression in late-life are characterized by several notable limitations. First, existing measures of aggression for older adults are predominately observational and mainly focus on individuals with dementia or those living in long-term care settings. A lack of appropriate measures exists for the sizable portion of older adults who maintain high cognitive functioning and functional independence (McLaughlin et al., 2012). Secondly, of the plethora of existing aggression measures, only a small fraction were designed for older adults and even fewer have been empirically examined among this population (Suris et al., 2004). Use of scales which have not been appropriately assessed among older adults could be misleading and in some cases may yield completely inaccurate information. Third, existing measures of aggression are restricted in the type of aggression that they intend to measure, focusing on state aggression and physical/verbal manifestations of aggression. Other common forms of aggression in late-life, such as indirect aggression, lack age-appropriate measures. Fourth, most of the scales designed for older adults are meant to capture aggressive behaviors after they occur. Only one measure, the ABRAT-L, was designed to predict future aggression among older adults. Finally, existing measures of aggression in late-life have been validated on predominately White samples and have largely failed to examine potential gender differences. While some of these measures have been translated and validated in other languages (e.g., Adama et al., 2013; Lam et al., 1997), there is a void of information regarding the ability of these scales to adequately measure aggression in underserved and underrepresented populations. Given documented racial and gender differences in aggression (Denson et al., 2018; Harris, 1996), additional research which assesses the psychometric properties of existing late-life aggression scales among these populations is direly needed.

In light of the aforementioned limitations, several avenues for future research are proposed. First, commonly used observational measures of aggression with unknown psychometric

properties in late-life, such as the MOAS, should be subjected to rigorous psychometric investigations in older adult samples prior to being used for clinical or research purposes. In this vein, subscales of aggression found as part of larger neuropsychiatric measures should also be further evaluated prior to being used individually. Secondly, in order to expand the scope of existing measures, future research would benefit from examining the reliability and validity of well-known self-report measures of aggression among diverse older adult samples including measures which assess trait aggression or indirect aggression. Third, additional measures which predict the future occurrence of violence and aggression in late-life are warranted and could have important clinical implications.

In the words of Lord Kelvin, "When you can measure what you are speaking about, you know something about it; but when you cannot measure it, your knowledge is of a meager and unsatisfactory kind." Such a statement rings especially true when discussing issues with such clear real life relevance as aggression in late-life. It is our hope that this review will assist researchers as they navigate the complicated task of selecting measures to include in future research investigations of aggression in older adults. Only when we can accurately measure a phenomenon can we truly begin to build a knowledge base with the hope of improving the human condition.

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Table 1

Commonly used measures of aggression among older adults.

Measure	Number of items	Range	Administration	Setting/target population	Types of aggression measured	Psychometric properties in older adults
The Aggressive Behavior Risk Assessment Tool for Long-Term Care (ABRAT-L)	6	0–8	Nursing staff	Long-term care patients	Direct; Prospective Aggression	Sensitivity: 55.60–56.60% Specificity: 90.80–94.20%
Aggressive Behavior Scale (ABS)	4	0–12	Trained observer	Long-term care & nursing home patients	Direct; Verbal; Physical; Socially Inappropriate Behavior; Resistance to Care	Reliability: Internal consistency: Cronbach's α = 0.79–0.93 Validity: Concurrent validity: Association with CMAI aggression subscale = 0.72, $p < .001$
Modified Overt Aggression Scale (MOAS)	4	0–40	Nursing staff	Inpatient psychiatric adults	Direct; Verbal; Physical; Self-Aggression; Aggression Against Property	Unknown
The Rating Scale for Aggressive Behaviour in the Elderly (RAGE)	21	0–61	Nursing staff	Psychogeriatric inpatients	Direct; Verbal; Physical; Agitation	Reliability: Internal consistency: Cronbach's α = 0.89 Inter-rater: $r = 0.94$ Test-retest: $r = 0.88$ at 14 days Validity: Concurrent validity: Association with nurses' observations of aggression ($r = 0.86$, $p < .001$), CMAI ($rho = 0.73$, $p = .005$) and BARS ($rho = 0.84$, $p < .001$)
The Ryden Aggression Scale (RAS) & Ryden Aggression Scale 2 (RAS-2)	25	0–125	Nursing staff or family caregiver	Patients with dementia	Direct; Verbal; Physical; Sexual	Reliability: Internal consistency: Cronbach's α = 0.88 Inter-rater: $r = 0.88$ Test-retest: $r = 0.86$ at 8–12 weeks Validity: Construct validity: RAS-1 to RAS-2 $r = 0.65$, $p < .001$ Content validity: expert review

Note. CAMI = Cohen-Mansfield Agitation Inventory, BARS = Brief Agitation Rating Scale.

Table 2

Measures with aggression subscales for use among older adults.

Measure - Subscale	Number of items	Range	Administration	Setting/target population	Type of aggression measured	Psychometric properties in older adults
The Cohen-Mansfield Agitation Inventory (CMAI) - Aggression subscale	29 12[a]	29–203 0–84[a]	Nursing staff, physicians, caregivers	Long-term care & nursing home patients	Direct; verbal; physical	Reliability: Internal consistency: Cronbach's α = 0.83–0.92 Internal consistency of the Aggression Behavior Subscale: Cronbach's α = 0.81–0.83[a] Test-retest: $rho = 0.94$, $p < .001$ Validity: Concurrent validity: Association with BEHAVE-AD, $r = 0.28$–0.43, $p < .05$; association with BSSD, $r = 0.40$–0.52, $p = .005$; association with RAGE, $rho = 0.73$, $p = .005$; association with BARS, $rho = 0.84$, $p < .001$
Disruptive Behavior Rating Scales (DBRS) - Physical and Verbal Aggression subscales	4 2[a]	0–5 0–5[a]	Nursing staff, long-term care staff	Nursing homes patients with dementia	Direct; physical; verbal	Reliability: Interrater reliability: Overall measure: 0.90–0.93; Physical Aggression subscale: 0.91–0.92[a]; Verbal Aggression subscale: 0.83[a] Validity: Concurrent validity: Physical Aggression subscale associated with nurses' assessment of behavior severity ($r = 0.69$, $p < .01$) and distress ($r = 0.82$, $p < .001$)[a]; Verbal Aggression subscale moderately associated with nurses' assessment of behavior distress ($r = 0.65$, $p < .01$) but not severity ratings ($r = 0.38$, $p > .05$)[a]
Pittsburgh Agitation Scale (PAS) - Aggressiveness subscale	4 1[a]	0–16 0–4[a]	Nursing staff	Long-term care and nursing home patients with dementia	Direct; verbal; physical; auto-aggression; aggression of property	Reliability: Total scale ICC: 0.82 in inpatient unit and 0.93 in nursing home Aggressiveness Subscale ICC: 0.63 in inpatient unit and 1.00 in nursing home .[a] Validity: Concurrent: PAS total scores significantly different when interventions to reduce agitation have been used, $p < .001$; total scores associated with real-time monitoring of aggression, $r = 0.89$, $p < .001$.

Measure - Subscale	Number of items	Range	Administration	Setting/target population	Type of aggression measured	Psychometric properties in older adults
Behavioral Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD) - Aggressiveness subscale	25 3[a]	0–75 0–12[a]	Nursing staff, psychologists, physicians	Patients with dementia	Direct; verbal; physical	Reliability: Inter-rater: ICC = 0.96, $p < .01$; Aggressiveness subscale: ICC = 0.86, $p < .01$ for rater consistency and ICC = 0.85, $p < .01$ for rater agreement[a] Validity: Construct validity: Behavioral symptoms distinguished from cognitive and functional symptoms of dementia
The Nursing Home Behavior Problem Scale (NHBPS) - Uncooperative or Aggressive Behavior subscale	29 8[a]	0–116 0–32[a]	Nursing staff or family caregiver	Patients with dementia residing in nursing homes	Direct; verbal; physical; resistance to care	Reliability: Interrater of total scale: $r = 0.75$–0.83 Interrater of uncooperative or aggressive behavior subscale: $r = 0.76$[a] Validity: Criterion: Increased total scores associated with greater sedative use and physical restraint Convergent: Total score associated with NOSIE, $r = -0.75$, and CMAI, $r = 0.91$; Uncooperative or Aggressive Behavior subscale associated with NOSIE, $r = -0.71$, and CMAI, $r = 0.86$[a]

Note. BSSD = Behavioral Syndromes Scale for Dementia, BARS = Brief Agitation Rating Scale, CMAI = Cohen-Mansfield Agitation Inventory, ICC = intraclass correlation coefficient, NOSIE = Nurse Oriented Scale for Inpatient Evaluation, RAGE = Rating Scale for Aggressive Behaviour in the Elderly.

[a] Denotes information pertaining to aggression subscales.