Application and implementation of brief geriatric assessment in primary care and community settings: a scoping review

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Abstract

Background Comprehensive Geriatric Assessment is the gold standard of clinical care for older patients but its application in the primary care setting is limited, possibly due to its time-consuming process. Hence, a brief geriatric assessment could be a feasible alternative. We conducted a scoping review to identify which brief geriatric assessment tools have been evaluated or implemented in primary and community care settings and to identify the domains assessed including their reported outcomes.

Methods CENTRAL, PubMed and Embase were searched using specific text words and MeSH for articles published from inception that studied evaluation or implementation of brief geriatric assessments in primary care or community setting.

Results Twenty-five articles were included in the review, of which 11 described brief geriatric assessments implemented in community, nine in primary care and five in mixed settings. Physical health, functional, mobility/balance and psychological/mental emerged as four domains that are most assessed in brief geriatric assessments. Self-reported questionnaire is the key approach, but uncertainty remains on the validity of subjective cognitive assessments. Brief geriatric assessments have been administered by non-healthcare professionals. The duration taken to complete ranged from five to 20 min. Studies did not report significant change in the clinical outcomes of older adults except for better identification of those with higher needs.

Conclusion The studies reported that brief geriatric assessments could identify older adults with unmet needs or geriatric syndromes, but they did not report improved health outcomes when combined with clinical intervention pathways. Clarity of brief geriatric assessments' questions is important to ensure the feasibility of using self-administered questionnaire by older adults. Future studies should determine which groups of older adults benefit the most from the brief assessments when these are paired with additional evaluations and interventions.

Keywords Brief geriatric assessment, Primary care, Community setting

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Introduction

Comprehensive Geriatric Assessment (CGA) is defined as a multi-dimensional and multi-disciplinary approach to identify medical, functional, and social needs, followed by the development of a coordinated and targeted care plan to address the identified needs of older patients [1]. Given its recognition as the gold standard of clinical care for frail older patients in the hospital setting [1] and beneficial effect yielded in mortality reduction [2], extension

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of CGA to primary care could be considered given that this setting often provides the first point of clinical contact for this population [3]. However, the application of CGA in the primary care setting is limited [3], possibly due to its time-consuming process [3, 4]. Typically, a CGA may take up to two hours [5].

CGA is usually conducted by the multidisciplinary team and medical professionals in acute hospital and primary care settings respectively [6]. Impacted by the mismatch of supply of healthcare professionals and the increasing needs of an ageing population, briefer or simplified geriatric assessment which can either be self-administered by older adults or administered by trained non-healthcare professionals have increasing appeal.

Hence, brief geriatric assessment (BGA) has emerged as a possible alternative for CGA in primary care and community settings, including in the homes of those with limited access to primary care services. Unlike CGA, the role of BGA is unclear in clinical pathways. Despite the shorter duration of BGA, ranging from 15 [6] to 30 min [7], implementing BGA widely remains challenging given the rapid growth of older populations globally.

To date, there is a lack of consensus on which community-dwelling adults should be targeted to receive geriatric assessment, due in part to its varied purposes which range from health promotion to early detection of impairments or diseases [6]. It is suggested that neither robust older adults [8] nor those in poor health or with disability [9] benefit from geriatric assessment. Thus, older adults in the middle of the health spectrum are more likely benefit from BGA and they may have two or more chronic conditions or polypharmacy [8]. Finding a BGA that could easily be applied in a community setting to identify older adults in this middle spectrum could be crucial for early intervention.

Despite the emergence of BGA in geriatric care, there is also no consensus on which domains should be assessed. BGA was often developed based on prior literature [10, 11], CGA [11] and from the pool of assessment tools for different domains [12, 13]. The latter possibly arose due to the need to cater to different contexts, available resources and different targeted populations. As a result, the envisaged role of BGA as a shortened version of CGA is debatable, given that the former largely emphasises screening to allow early detection of impairments while the latter serves to direct care processes. Moreover, the application of the four focus areas of CGA, medical, psychological, social, and functional [1, 14] in BGA remains to be studied.

Heterogeneity of BGA tools, ranging from their components (assessed domains) to implementation (self-administered versus interviewer-administered) makes selection of the most appropriate BGA tool for specific contexts and subgroups of older adults an uphill task for practitioners. Given these knowledge gaps, our scoping review sought to identify tools and methodologies employed in BGA for older adults and the practical considerations and levels of implementation in primary care and community settings.

Methods

This review was conducted with reference to the COCHRANE Scoping Review Method guidance document [15]. The review questions were formulated based on prior discussions with health policy makers that positioned geriatric assessment as a key population health initiative to improve the quality of life of older adults. This study conforms to the PRISMA guidelines and reports their required information accordingly (see Additional file 1).

Search strategy

A systematic search was conducted with three electronic databases – Cochrane Central Register of Controlled Trials (CENTRAL), PubMed and Embase. The search strategy was developed using the PCC framework (population, concept, context), adopting a combination of medical subject heading (MeSH) terms and text words related to older adults, geriatric assessment, abbreviated, brief, rapid and short. Articles published from inception till 18 April 2024 were considered for inclusion. Additional file 2 provides the search strategy used for PubMed.

The study inclusion criteria were 1) study participants 60 years old and above; 2) evaluation and/or application of BGA in the primary care or community settings; and 3) BGA that minimally assesses physical and mental domains. The exclusion criteria were 1) studies targeting population with specific conditions (e.g., dementia, mild cognitive impairment, hypertension, diabetes, stroke, pre-surgical); 2) studies conducted solely in acute hospitals, long term care facilities, post-discharge from hospitals or specialist outpatient clinical settings; and 3) conference proceedings, commentary, or studies without full texts in the English language.

Study selection and data extraction

Three reviewers (JG, LKL and PL) performed the screening of citations using Covidence, a web-based tool [16]. The title and abstract of each citation were independently screened by two reviewers and the same process was repeated for articles at the full-text screening stage. Any disagreement during screening (either title/abstract or full text) was resolved by the third reviewer. The PRISMA flow diagram in Fig. 1 presents the flow of study selection. A data extraction sheet was developed and pilot-tested prior to the data extraction phase. Data extraction was
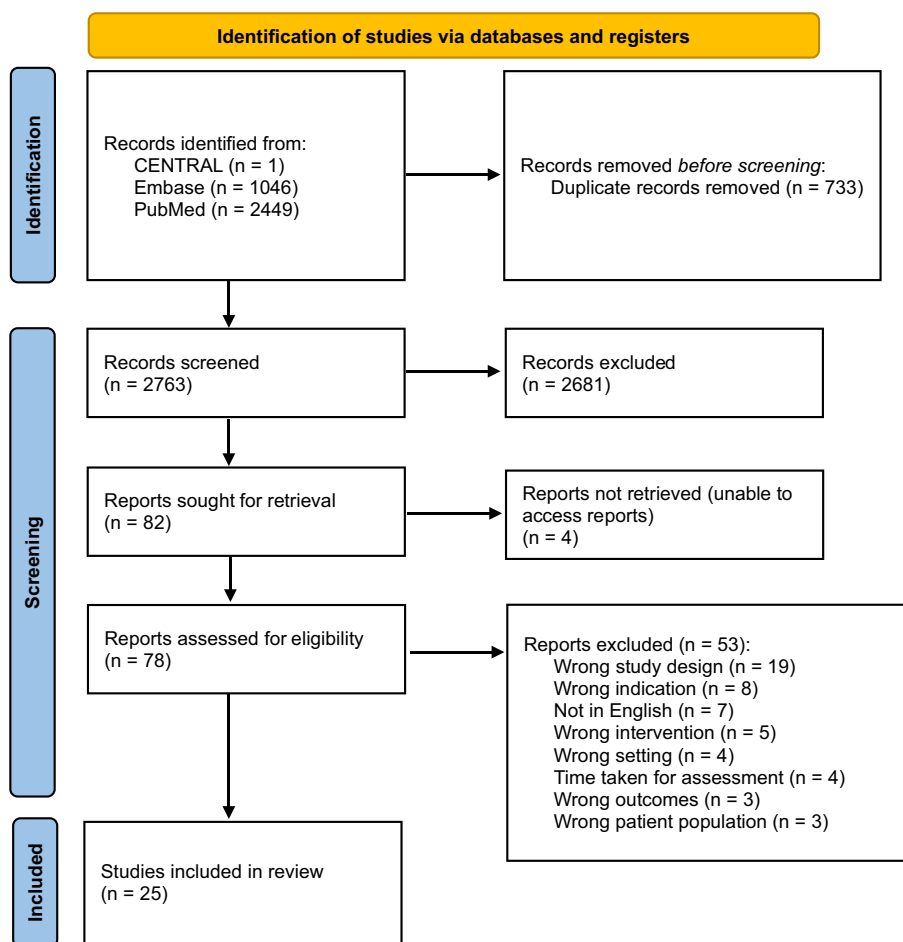
Fig. 1 PRISMA flow diagram

performed on all included articles by either JG, LKL or PL using a data extraction sheet to capture details of the study population, overall study aims, study population, BGA tool, domains assessed by BGA and summarised findings. The extracted information was cross-checked by a second reviewer for accuracy. Risk of bias assessment was not conducted given our review objectives.

Results

Study characteristics

Twenty-five studies were included in this review (Table 1). Among them, 11 studies involved the implementation of BGA in the community [11, 17–26], nine in the primary care setting [10, 27–34] and five in mixed settings of community and primary care [35–37], community, primary care, hospital and/or long-term care facilities [38, 39]. The last two referenced studies were included given that their BGA implementations were in community and primary care settings for majority (about 80%) of the total study populations.

Studies on BGA were reported since the 1990s with two studies published in 1997 [19, 32], five studies in the 2000s [17, 24, 29, 35, 39], eight studies in the 2010s [10, 20–23, 25, 27, 28] and the remaining 10 studies from 2020 onwards [11, 18, 26, 30, 31, 33, 34, 37–39].

Seven studies were conducted in North America [17, 20, 24, 32, 36, 38, 39], one in South America [28], two in United Kingdom [19, 29], six in Europe [10, 23, 27, 30, 33, 34] and the remaining nine studies in either Oceania [21, 22, 35] or Asia [11, 18, 25, 26, 31, 37].

Study population

A total of 79,560 older adults were examined in the included studies. Their mean age was 79.7 years in 21 studies ($n=67,027$). Four studies [19, 20, 25, 39] did not report the mean age. Among the 22 studies that reported gender distribution, female older adults ($n=41,034$) accounted for 60.4% of the study population ($n=67,981$).

Table 1 Studies that included BGA as part of the evaluation and/or implementation in primary care and community setting

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
Alessi et al., 2003 [17]	To assess the reliability & validity of a postal survey	Longitudinal cohort study	n = 2575 [73.5(5.7) yo]; 3.0% ♀ Older adults, aged ≥ 65yo who have multiple geriatric problems	Community	GPSS	Yes Percentage agreement test–retest – 88.3% Weighted kappa 0.70	Yes Against established questionnaire for each domain	Sensitivity and specificity for all domains except memory & ADL ranged from 0.71 to 0.81 and 0.69 to 0.82 respectively GPSS cutoff points ≥ 4 (high risk) has sensitivity & specificity of 89% & 42% respectively
Balsinha et al., 2018 [27]	To examine the usefulness & feasibility of SPICE in the primary care setting	Cross-sectional	n = 51 [74.9(7.3) yo]; 60.8% ♀ Patients, aged 65yo visited GP	Primary care	SPICE	No	No	The agreement between patents' perception & doctor's perception (based on medical record) using SPICE were fair (k = 0.56 to 0.71)
Chen et al., 2020 [18]	To develop simplified & brief screening tool	Development & validation study	n = 200 [77.5(7.5) yo]; 62.0% ♀ Patients, > 65yo in the community	Community	HCOASS	Yes The internal consistency was acceptable (α = 0.73)	Yes The cut off of 6/7 score yielded 88% sensitivity, 81% specificity, 72% PPV & 93% NPV AUC for the HCOASS was 0.91	The screening scale demonstrated adequate reliability, content validity & discriminant validity
de Souza Orlandi et al., 2018 [28]	To validate the translated RGA	Cross-sectional	n = 148 [70.0(6.8) yo]; 68.2% ♀ Patients, aged 60yo receiving primary care services	Primary Care	RGA Incontinence	Yes Internal consistency ranged from 0.736 to 0.801 ICC ranged from 0.716 to 0.796	Yes Satisfactory concurrent validity, discriminant, convergent & divergent validity	Brazilian version of RGA is a reliable & valid tool to assess older adults
Donald 1997 [19]	To develop & validate the EARRS for community-dwelling older adults	Development & validation study	n = 112 [NS]; NS ♀ Community-dwelling older adults (> 75yo) receiving day care service	Community Day Care hospital	EARRS	Yes Test–retest reliability (Weighted kappa 0.75 to 1.0) Inter-tester reliability (Weighted kappa 0.66 to 0.96)	Yes The correlation between EARRS & Barthel Index was poor (−0.50 to −0.65)	EARRS has a good face validity & was a user-friendly scale

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Table 1 (continued)

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
Fletcher et al., 2004 [29]	To examine the effects of different clinical pathways (universal vs targeted referral) in the primary care services, following BGA screening	Longitudinal cohort study	n = 43,219 [81.4(4.9) yo]; 63.9% ♀ Community-dwelling older adults (≥ 75yo) receiving primary care service	Primary Care	NS	No	No	Patients who received universal referral for further assessment had lower hospital readmission compared to patients receiving targeted referral
Gaugler et al., 2011 [20]	To develop a screening tool and deliver a multi-component "diversion" service program to support private-pay older adults	Development and implementation of assessment tool	n = 261 [NS]; 66.3% ♀ Community-dwelling older adults who are private-pay & at risk for nursing home admission or assisted living entry	Community	LWAH-RS	No	No	A threshold of 3 on the summed score of the LWAH-RS was considered "high risk" & most older adults were classified as "high risk". Screening was followed by consultation
Kerse et al., 2008 [35]	To examine the utility of the BRIGHT questionnaire in identifying community-dwelling older people with disability-related needs	Validation study	n = 121 [80.9(4.9) yo]; 54.5% ♀ Community-dwelling older adults (≥ 75 years old) receiving or had previously received primary care service	Community Primary Care	BRIGHT	Yes Test–retest reliability Cronbach alpha of 0.77	Yes BRIGHT cut-off ≥ 3 with IADL yielded 86% sensitivity & specificity BRIGHT cut-off ≥ 3 with adverse outcomes yielded 65% sensitivity & 84% specificity	BRIGHT has reasonable utility in identifying those with disability but the findings could not be generalised to those with significant level of disability
Kerse et al., 2014 [21]	To assess the impact of using screening to improve case finding on hospitalizations, residential care placement, functional decline, & quality of life for community-dwelling older adults	Cluster RCT	n = 3753 [80.3(4.6) yo]; 54.7% ♀ Community-dwelling older adults (≥ 75yo) receiving or had previously received primary care service	Community	BRIGHT	No	No	The intervention group which received BRIGHT screening had higher number of residential care placement & decreased functional performance compared to the control group

Table 1 (continued)

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
King et al., 2017 [22]	To describe the innovative model of care, incorporating screening to identify high-needs older people	Single arm pilot study	n = 416 [79.5(2.4) yo]; 48.1% ♀ Community-dwelling older adults (≥ 75yo) receiving or had previously received primary care service	Community	BRIGHT	No	No	The BRIGHT screen proved to be an efficient & systematic method for population case finding of high-needs older people through GP practices
Lach et al., 2023 [38]	To examine the utility of RGA as a fall risk screening tool at various settings	Cross-sectional study	n = 8686 [77.6(NS) yo]; 65.0% ♀ Community-dwelling older adults (≥ 65yo) receiving or had previously received primary care service	Community Primary Care Hospitals Long-term Care	RGA	No	No	RGA significantly predicted fall history. However, 80% of older adults were assessed at the hospital & long-term care setting where older adults were generally older
Maggio et al., 2020 [30]	To validate the Sunfrail Checklist in primary care, verify its discriminating capacity of identifying patients requiring CGA	Descriptive, observational study	n = 122 [81(4) yo]; 53.3% ♀ Community-dwelling older adults (≥ 75yo)	Primary Care	Sunfrail Checklist	No	Yes The degree of agreement between GP & CGA on frailty is 66.3%, with a Cohen k of 0.353; NPV of 84.6%	Sunfrail Checklist cannot replace the CGA. The Sunfrail Checklist seems to be an excellent screening tool of frailty due to its high discriminating power of false negatives
Matthews et al., 2004 [36]	To validate the SFQ & examine its association with the outcomes of institutionalisation & death at 3-year follow-up	Validation and longitudinal study	n = 48 [76.2(NS) yo]; 60.4% ♀ Community-dwelling older adults (≥ 63yo) receiving primary care service	Community Primary Care	SFQ	No	Yes SFQ was correlated to Timed Up and Go and repetitive Sit-to-Stand tests, bimanual dexterity	The inclusion of additional cognitive assessment tools (modified SFQ) improved the gap of SFQ which are self-reported-based The "modified" SFQ score but not the SFQ score was a significant predictor of institutionalisation and death combined

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Table 1 (continued)

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
Merchant et al., 2020 [31]	To explore the feasibility & implementation of RGA iPad application, prevalence of frailty, sarcopenia & anorexia of ageing	Feasibility study	n = 2589 [73.1(6.5) yo] 52.5% ♀ Community-dwelling older adults (≥ 65yo) receiving primary care service	Primary Care	RGA	No	No	The RGA app is a rapid & feasible tool to be used in primary care for identification of geriatric syndrome & assisted management
Moore et al., 1997 [32]	To examine the effectiveness of BGA coupled with clinical summaries designed to assist physicians in managing the screen identified problems in community-based clinic	Cluster RCT	n = 261 [76.4(NS) yo]; 70.9% ♀ Community-dwelling older adults (≥ 70yo) newly received primary care service	Primary Care	NS	No	No	Hearing loss was more commonly diagnosed & managed by physicians for patients in the intervention group compared to the control group. No other differences were detected between the two groups
Mueller et al., 2018 [10]	To examine the diagnostic performance of a brief assessment tool compared to a CGA	Prospective diagnostic study (validity)	n = 85 [78(6) yo]; 54.1% ♀ Community-dwelling older adults (≥ 70yo)	Primary Care	NS	No	Yes Sensitivity 25% (undernutrition) to 82.1% (hearing impairment); specificity 45.8% (visual impairment) to 87.7% (undernutrition). NPV 73.5% to 84.1%, except visual impairment 50.0%	The performance of the Brief Assessment Tool in detecting geriatric syndromes compared to a CGA was satisfactory for most syndromes

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Table 1 (continued)

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
Mueller et al., 2021 [33]	To determine whether the Active Geriatric Evaluation (AGE) tool, which consists of brief assessment & management plans, could slow functional decline in older patients	Cluster RCT	$n = 429$ [82.5(4.8) yo]; 62.7% ♀ Community-dwelling older adults (≥ 75yo) who visited GP at least twice in the past year	Primary Care	NS	No	No	BGA cum management of geriatric syndrome from AGE did not slow functional decline of patients aged 75 years and older over a 2-year course compared with routine care. There was no significant difference in the quality of life & healthcare use between the intervention and control group
Oubaya et al., 2014 [23]	To validate the psychometric properties of the SEGAm	Longitudinal, prospective	$n = 167$ [77(7) yo]; 70.7% ♀ Community-dwelling older adults (≥ 65yo)	Community	SEGAm	Yes Internal consistency was good, with a Cronbach's alpha coefficient at 0.68, & test–retest reliability with intra-class correlation coefficient of 0.88	Yes Good discriminant capacity in differentiating those with good versus poor performance in mood, nutrition, balance, autonomy & comorbidities, except for the cognitive function	SEGAm instrument is recommended for use by all those involved in gerontological & geriatric care, to detect patent or latent frailty, with the caveat of valid cognitive evaluation
Rubenstein et al., 2007 [24]	To examine the effectiveness of a system consists of screening, assessment, referral, & follow-up provided within primary care for high-risk older outpatients	RCT	$n = 792$ [74.4(6.0) yo]; 3.2% ♀ Community-dwelling older adults (≥ 65yo) who have multiple geriatric problems	Community	GPSS	No	No	This study demonstrated that a system of postal screening, case finding, assessment, referral, & follow-up case management can increase the recognition and evaluation of geriatric conditions & improve access to geriatric services

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Table 1 (continued)

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
Sanford et al., 2020 [39]	To assess the prevalence of the 4 geriatric syndromes of dementia, frailty, sarcopenia, & weight loss utilising the RGA	Prevalence study (secondary analysis of clinical data)	n = 11,344 [NS yo]; NS ♀ Older adults (≥65yo)	Community Primary Care Hospitals Long-term Care	RGA Advanced directive	No	No	The RGA, a valid screening tool, identified the prevalence of one or more of the geriatric syndromes of frailty, sarcopenia, weight loss, & dementia in the older adult population across all care continuums to be high
Tai et al., 2021 [11]	To develop an appropriate BGA tool to diagnose & manage geriatric syndromes for community-dwelling older adults	Development and validation study	n = 1258 [73.5(6.2) yo]; 53.2% ♀ Community-dwelling older adults (≥65yo)	Community	NS	No	Yes Sensitivities 48% to 97.6% for 6MWT; 58.3% for cognitive impairment; 62.7% for mood impairment	The Rinne tuning fork test, Snellen scale test, BMI, wall-occiput distance, or rib-pelvis distance were included into the final version of the BGA
Tan et al., 2021 [37]	To develop and cross-validate self-administered (SA)-RGA against Administrator-administered (A)-RGA to identify seniors with geriatric syndromes	Development and validation study	n = 123 [71(5.9) yo]; NS ♀ Community-dwelling older adults (≥60yo)	Community Primary Care	RGA	No	Yes High sensitivity, specificity, NPV & positive likelihood ratio on questions pertaining to fatigue, 5 or more illnesses, weight loss & falls in the past year There were discrepancies for functional assessment & SARC-F between the self-administered & administrator-administered RGA	There remains discrepancy between self-administered & administrator-administered RGA for functional performance & strength evaluation Cognitive domain could not be assessed

Table 1 (continued)

Authors, year	Overall aim	Study design	Study population	Setting	BGA tool	Reliability	Validity	Conclusion
Woo et al., 2015 [25]	To explore the feasibility of using the FRAIL scale in a community screening, followed by clinical validation using CGA of those classified as pre-frail or frail	Feasibility study	n = 816 [NS yo]; 85.4% ♀ Community-dwelling older adults (≥ 65yo)	Community	FRAIL	No	No	This study shows that the FRAIL scale may be used by non-healthcare professionals as a community screening tool for frailty, as part of a step care approach to primary care for older people
Yu et el., 2021 [26]	To examine the psychometric properties of the online version of the FRAIL scale & its implementation acceptability	Feasibility study & longitudinal study	n = 1882 [75.2(7.3) yo]; 76.8% ♀ Community-dwelling older adults (≥ 60yo)	Community	FRAIL	No	Yes	It is a validated & acceptable frailty screening tool for use by older persons and community centre staff
Zulfiqar 2021 [34]	To examine the validity of the ZFS tool & its implementation acceptability & feasibility	Validation & prospective study	n = 102 [82[NS] yo]; 53.9% ♀ Community-dwelling older adults (≥ 75yo)	Primary Care	ZFS	No	Yes	In comparison with CGA, ZFS yielded sensitivity 89.5%, specificity 68.9%, PPV 78.5% & NPV 83.8%

Ten studies involved older adults aged 65 years old and above [11, 17, 18, 23–25, 27, 31, 38, 39] while four studies examined the younger age group of 60 to 64 years old [26, 28, 36, 37]. The remaining studies adopted higher age cut-offs of either 70 [10, 32] or 75 years and above [19, 21, 22, 29, 30, 33–35]. The age requirement was not documented in one study [20].

BGA tools

Rapid Geriatric Assessment tool (RGA) was the most studied BGA tool [28, 31, 37–39], with the question on incontinence [28] or advanced directive [39] included as an additional item in two studies. The Brief Risk Identification of Geriatric Health Tool (BRIGHT) was examined in three studies [21, 22, 35] while two studies each used FRAIL scale [25, 26] and Geriatric Postal Screening Survey (GPSS) [17, 24]. The remaining studies adopted other BGA tools such as Elderly At Risk Rating Scale (EARRS) [19], High-need Community Older Adults Screening Scale (HCOASS) [18], Live Well at Home Rapid Screen (LWAH-RS) Tool [20], Senses, Physical ability, Incontinence, Cognition and Emotional distress (SPICE) [27], Sunfrail Checklist [30], Strawbridge Frailty Questionnaire (SFQ) [36], Modified Short Emergency Geriatric Assessment (SEGAm) [23], and Zulfiqar Frailty Scale (ZFS) [34]. There was no specific name of the BGA in five studies [10, 11, 29, 32, 33].

Assessed domains

The British Geriatric Society (BGS) CGA Toolkit for Primary Care Practitioners [5] was used to guide classification of the assessment domains for the BGA tools studied. The recommended six domains for assessment are Physical, Socioeconomic/Environmental, Functional, Mobility/Balance, Psychological/Mental and Medication Review. The included studies adopted BGA covering two to six domains from the BGS guidance. The coverage of four domains was most common [10, 20–22, 32, 33, 35], followed by five domains [17, 18, 23, 24, 30, 34], two domains [28, 31, 37–39], three domains [11, 27, 36], six domains [19, 29] and one domain [25, 26].

Physical [10, 17–19, 21–39] and psychological/mental [10, 11, 17–24, 27–39] domains were most commonly assessed, followed by mobility/balance [10, 11, 17–24, 27, 29, 30, 32–36] and functional [10, 11, 17–24, 29, 32, 33, 35]. Medication review [17, 19, 23, 24, 29, 30, 34] and socioeconomic [18–20, 29, 30, 34] were the least assessed domains (Table 2).

BGA implementation
Assessment mode

Most of the assessments were conducted primarily through in-person interviews [10, 11, 18, 19, 23, 25, 27, 30–34, 38, 39]. Postal mail was relied on in four studies [17, 21, 22, 24] while two studies used web-based platforms [26, 37]. A combination of approaches, such as in-person and phone interviews [20] as well as in-person interviews and postal mails [29, 35, 36] were also reported. One study did not report its assessment method [28].

Assessors

Doctors [10, 19, 27, 30, 32–34, 39], nurses [19, 23, 29, 31, 39], trained personnel [11, 18, 20, 23, 25, 26, 29, 31, 33, 38, 39] and healthcare professional [37, 39] conducted BGA while eight studies [17, 21, 22, 24, 26, 29, 35, 36] reported older adults self-administering the BGA tools. One study did not document the BGA assessor [28].

Duration of the assessment

Among 13 studies that documented the duration of BGA, the shortest duration reported was five minutes or less [23, 31, 34, 37–39]. The remaining studies reported either 8 to 15 min [11, 19, 20, 27, 32] or 20 min [10, 33]. Twelve studies did not report the duration of the assessment [17, 18, 21, 22, 24–26, 28–30, 35, 36].

Evaluation and application of BGA
Application of the BGA in the clinical pathway

Six studies evaluated the effectiveness of implementing clinical intervention pathways with BGA as the initial screening process [21, 22, 24, 29, 32, 33]. The studies did not report significant change in the clinical outcomes of older adults [21, 24, 29, 32, 33] except for better identification of those with higher needs [22, 24, 32].

Examination of the utility and implementation feasibility of BGA

Nine studies examined the utility of BGA in identifying geriatric syndromes [25–27, 31, 34, 35, 38, 39] or predicting hospitalisation and mortality [36] among community-dwelling older adults who have received or are receiving primary care services [27, 31, 35, 36, 38, 39]. Conversely, age was used as the inclusion criterion in three of the studies [25, 26, 34]. In this review, utility is defined as the usefulness of BGA. The validation of BGA [25, 26, 34–36] and the feasibility of its implementation [27, 31, 34] were commonly reported. Positive findings regarding BGA's utility in identifying unexpressed needs of older adults [27], predicting falls [38] and recognising geriatric syndromes [25, 26, 31, 34, 35, 39] were also noted.

Development and validation of BGA

Four studies focused on the development and reliability and/or validation of their respective BGA [11, 18, 19, 37]. One study reported the development and pilot of its

Table 2 Characteristics of the BGA tools adopted in the selected studies

Authors	BGA tool	Duration	Administration	Physical	Socioeconomic / Environmental	Functional	Mobility / Balance	Psychological / Mental	Medication Review
Alessi et al., 2003 [17]	GPSS	NS	Older adults	•		•	•	•	•
Balsinha et al., 2018 [27]	SPICE	8 min	General practitioners	•			•	•	
Chen et al., 2020 [18]	HCOASS	NS	Volunteers	•	•	•	•	•	
de Souza Orlandi et al., 2018 [28]	RGA Incontinence	NS	NS	•				•	
Donald 1997 [19]	EARRS	10 to 15 min	Nurses / Doctors	•	•	•	•	•	•
Fletcher et al., 2004 [29]	NS	NS	Nurse, non-healthcare professional & older adults	•	•	•	•	•	•
Gaugler et al., 2011 [20]	LWAH-RS	12 min	Caregiver coaches, care consultants, or support planners		•	•	•	•	
Kerse et al., 2008 [35]	BRIGHT	NS	Older adults	•		•	•	•	
Kerse et al., 2015 [21]	BRIGHT	NS	Older adults	•		•	•	•	
King et al., 2017 [22]	BRIGHT	NS	Older adults	•		•	•	•	
Lach et al., 2023 [38]	RGA	A few minutes	Professionals, students & trained volunteers	•				•	
Maggio et al., 2020 [30]	Sunfrail checklist	NS	General practitioners	•	•		•	•	•
Matthews et al., 2004 [36]	SFQ	NS	Older adults	•			•	•	
Merchant et al., 2020 [31]	RGA	≤ 5 min	Trained care coordinators and/or nurse	•				•	
Moore et al., 1997 [32]	NS	10 min	General practitioners	•		•	•	•	
Mueller et al., 2018 [10]	NS	20 min	General practitioners	•		•	•	•	
Mueller et al., 2021 [33]	NS	20 min	General practitioners / medical assistants	•		•	•	•	
Oubaya et al., 2014 [23]	SEGAm	5 min	Professionals, nurses & trained personnels	•		•	•	•	•
Rubenstein et al., 2007 [24]	GPSS	NS	Older adults	•		•	•	•	•
Sanford et al., 2020 [39]	RGA Advanced directive	4 to 5 min	Doctors, nurses, allied health & social workers	•				•	
Tai et al., 2021 [11]	NS	< 10 min	Trained personnel			•	•	•	

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Table 2 (continued)

Authors	BGA tool	Duration	Administration	Physical	Socioeconomic / Environmental	Functional	Mobility / Balance	Psychological / Mental	Medication Review
Tan et al., 2021 [37]	RGA	≤ 5 min	Older adults, healthcare personnel	•				•	
Woo et al., 2015 [25]	FRAIL	NS	Trained personnel	•					
Yu et al., 2021 [26]	FRAIL	NS	Older adults, trained personnel	•					
Zulfiqar 2021 [34]	ZFS	> 2 min	General practitioners	•	•		•	•	•

Abbreviations: *BRIGHT* Brief Risk Identification of Geriatric Health Tool, *EARRS* Elderly at risk rating scale, *GPSS* Geriatric Postal Screening Survey, *HCOASS* High-need Community Older Adults Screening Scale, *LWAH-RS* Live Well at Home Rapid Screen Tool, *NS* Not specified, *RGA* Rapid Geriatric Assessment, *SEGAm* Modified Short Emergency Geriatric Assessment, *SPICE* Senses, Physical ability, Incontinence, Cognition and Emotional distress, *SFQ* Strawbridge Frailty Questionnaire, *ZFS* Zulfiqar Frailty Scale

BGA tool [20]. Five studies examined the validity of their BGA tools [10, 17, 23, 28, 30], among which three studies incorporated reliability examinations [17, 23, 28].

Discussion

Our findings indicate that BGA is not used as an abbreviation for CGA; rather, it serves as a precursor to step-up care, such as CGA, if BGA uncovers unexpressed needs or geriatric syndromes in older adults. Subjective self-report questionnaires are the primary method used in BGA and are administered by trained non-healthcare professionals. Enhanced health outcomes in older adults were not reported when BGA was paired with clinical intervention pathways. To our knowledge, this is the first review to assess the utility and implementation of BGA in primary care and community settings.

The adoption of BGA in community and primary care has been reported to facilitate the identification of community-dwelling older adults with psychological distress [27] or depression [31], compromised independence in activities of daily living and instrumental activities of daily living [35], fall risk [31, 38], sarcopenia [31, 39], and anorexia [31, 39]. The studies also demonstrated the promising capability of BGA to identify frail older adults [25, 26, 31, 34, 39]. Since CGA is time-consuming, frailty screening is recommended for identifying older adults in need of CGA [40].

The intervention studies that integrated BGA into clinical intervention pathways in primary care and community settings did not document positive outcomes regarding mortality or functional ability among older adults. This corroborates similar findings from a previous systematic review on CGA in primary care [3]. The heterogeneity of clinical interventions, including follow-up assessments and delivered intervention (e.g., specialised intervention, education) as well as follow-up periods

ranging from 6 months to 3 years, complicates the interpretations of the findings. Most of these studies recruited individuals aged 75 and older who were visiting or had visited primary care services, rather than younger age groups, as seen in the studies focusing on the utility of the BGA. The intention may have been to target frail older adults, who are generally above 75 years old [41] or to prioritise resources for screening those aged 75 and above in the community [42]. It may be worthwhile to examine the potential confounding factors affecting changes in outcomes for this vulnerable group, such as insufficient intervention intensity and patient adherence rates [24], to better guide the development and refinement of the implementation strategies of the targeted interventions.

Among the six assessment domains recommended by BGS for CGA, physical health, psychological/mental, functional ability, and mobility/balance are the four domains most commonly assessed in BGA. At a minimum, assessments of physical health and psychological/mental health are included. Frailty assessment tools such as FRAIL, SFQ and ZFS were among the BGA tools used in the identified studies. Frailty is a multidimensional syndrome characterised by a reduction in the physiological reserves of different body systems [43]. Of note, the psychological/mental health domain was included in the frailty assessment questionnaires, such as SFQ and ZFS. Additionally, the item on fatigue in the FRAIL scale has high sensitivity and specificity in identifying older adults at high risk of depression [37], and the assessment of fatigue is more oriented toward a psychological interpretation [44]. The assessment of socioeconomic/environmental factor is less emphasised in BGA compared to CGA, possibly because socio-environmental resources are important considerations for physicians when selecting and prioritising targeted interventions for patients

[6]. However, these factors are less emphasised during the initial screening in the two-stage process of geriatric assessment [42].

Majority of the included studies avoided using objective measurements, which are typically more time-consuming. Self-reported questionnaires, whether interviewer-administered or self-administered are the main approach in BGA. While the validity of self-reported questionnaires for physical, functional, mobility, psychological domains are generally acceptable, the cognitive domain falls short [11, 17, 23, 34, 36]. Self-reported memory decline is commonly elicited in BGA [17, 20, 23, 30, 34–36]. Although it could indicate early dementia [45], it is not recommended as a proxy for cognitive assessment [45, 46]. The integration of objective measures of cognition [36] or input from caregivers [34] helps improve the feasibility [34] and validity [36] of BGA tools.

Most versions of BGA can be completed within 10 min; however, they remain challenging for general practitioners to incorporate into routine clinical care [27]. Slightly less than half of the included studies engaged trained non-healthcare professionals to administer the tool, which aligns with the recommendation that geriatric assessment or screening should be quick and easy to administer without the need for healthcare resources, particularly if it aims to identify older adults in need of CGA [47]. While the agreement between clinician-administered and trained non-healthcare professional-administered BGA has not been well-examined, high agreement between clinician-administered and lay-person-administered geriatric assessment has been reported for inter-RAI [48]. Notably, about a third of the studies required older adults to self-administer the BGA, which could be a more sustainable approach since it is less resource-intensive. Web-based BGA [26, 37] has also emerged in the last decade. Better quality of responses from web-based assessments, in terms of fewer unanswered questions and longer responses to open-ended questions has been reported elsewhere [49], although the study population was not well-described. Nonetheless, both paper or web-based self-administered BGA has their challenges, particularly for older adults who may struggle with ambiguous terms. Phrases like "some difficulties" or "loss of weight" can be subjective and vary widely in interpretation [26, 37]. Incorporation of explanatory notes and probing questions to improve clarity in the meaning of questions is suggested as a way to address this issue [26, 37].

Our findings are consistent with the scope of the scoping review, which aims to examine emerging evidence and identify knowledge gaps [50] regarding the utility and implementation of BGA in community and primary care settings. The current evidence suggests that BGA can serve as a screening tool to identify older adults with unexpressed needs or geriatric syndromes who may require step-up care. Therefore, the findings of our scoping review indicate that BGA should be easily implemented and completed within 10 min. The widespread use of a self-reported questionnaire suggests its feasibility. At a minimum, BGA should include assessments of physical health and psychological/mental domains, though mobility, balance, and functional abilities are also commonly assessed. Furthermore, BGA may not need to be conducted by healthcare professionals, as several studies have involved non-healthcare professionals as assessors.

The relatively small number of studies identified for this review, combined with the heterogeneity of the BGA tools used, has limited the depth and breadth of our analysis. The identification of only 25 studies may be attributed to the exclusion criteria, which excluded settings such as specialist outpatient clinics and emergency department. We believed that the older adults recruited from these settings would have different needs and intervention compared to those residing in the community.

Considering the sampling approaches adopted by most studies, it appears that the primary goal of BGA may be to conduct case-finding among those at risk for adverse health outcomes, rather than focusing solely on age as a criterion. However, it is important to approach this interpretation with caution, as many individuals may present with diverse health issues when seeking primary care, ranging from routine check-ups to significant concerns. Future research is needed to identify which subgroups of older adults benefit most from BGA when combined with additional evaluations and interventions, as well as to consider differential treatment effects by age [51].

The implementation of questionnaire-based BGA is less resource-intensive and allows for self-administration by older adults, However, its accessibility for older adults with low literacy or upper extremities mobility limitations remains a concern. Therefore, future studies should: a) explore the feasibility of audio-delivered, web-based questionnaires [52]; b) further examine and refine self-reported questionnaires for the cognitive domain to enhance their validity, potentially incorporating a hybrid approach to cognitive assessment, such as input from informants [53] and/or objective assessments by healthcare professionals; and c) investigate the impact of screening older adults' social situations on long-term health outcomes for this vulnerable group, given the strong association between social situations and both physical and mental health [54, 55].

Conclusion

Our review's findings bolster the understanding of BGA as a feasible tool for identifying older adults with unexpressed needs and geriatric syndromes. It can serve as a precursor to step-up care if the assessment uncovers significant needs, typically including evaluations of both physical and psychological/mental domains. However, there is lack of evidence regarding its effectiveness in improving their health outcomes when combined with clinical intervention pathways. The ambiguity surrounding which subgroups of older adults would benefit most from BGA assessment and follow-up interventions presents a valuable opportunity for future research.

Abbreviations

CGA	Comprehensive geriatric assessment
BGA	Brief geriatric assessment
CENTRAL	Cochrane central register of controlled trials
RGA	Rapid geriatric assessment tool
BRIGHT	Brief risk identification of geriatric health tool
GPSS	Geriatric postal screening survey
EARRS	Elderly at risk rating scale
HCOASS	High-need community older adults screening scale
LWAH-RS	Live well at home rapid screen
SPICE	Senses, physical ability, incontinence, cognition and emotional distress
SFQ	Strawbridge frailty questionnaire
SEGAm	Modified short emergency geriatric assessment
ZFS	Zulfiqar frailty scale
BGS	British geriatric society

Supplementary Information

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> Supplementary Material 1.
>
> Supplementary Material 2.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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