

ORIGINAL ARTICLE

A modified Delphi and cross-sectional survey to facilitate selection of optimal outcomes and measures for a systematic review on geriatrician-led care models

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Abstract

Objective: The objective of this study was to identify relevant outcomes and measures to inform a systematic review (SR) on the comparative effectiveness of geriatrician-led care models.

Study Design and Setting: In the modified Delphi to select outcomes for inclusion in the SR, knowledge users (KUs) from Ontario, Alberta, and Saskatchewan rated outcome importance using a Likert scale. A survey was then completed by geriatricians to determine optimal measures for selected outcomes. Findings were analyzed using frequencies, means, and standard deviations (SDs).

Results: Thirty-three KUs (patients, caregivers, policymakers and geriatricians) rated 27 outcomes in round 1 of the modified Delphi. Top-rated outcomes included function (mean $6.85 \pm SD 0.36$), cognition ($6.47 \pm SD 0.72$), and quality of life ($6.38 \pm SD 0.91$). Twenty-three KUs participated in round 2 and rated 24 outcomes. Top-rated outcomes in round 2 were function ($6.87 \pm SD 0.34$), quality of life ($6.45 \pm SD 1.10$), and cognition ($6.43 \pm SD 0.73$). The survey was completed by 22 geriatricians and the highest ranked measures were Activities of Daily Living (function), Mini-Mental State Examination (cognition), and the Medical Outcomes Study SF-36 (quality of life).

Conclusion: We identified the most relevant outcomes and measures for patients, caregivers, policymakers, and geriatricians, allowing us to tailor the SR to KU needs. © 2019 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Keywords: Modified Delphi; Cross-sectional survey; Knowledge users; Outcome selection; Systematic review; Integrated knowledge translation

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Ethics approval: Ethical approval was obtained from St. Michael's Hospital (REB 16-320), Sunnybrook Health Sciences Center (REB 122-2017), and the University of Toronto (REB 34044).

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What is new?

Key findings

- Cognition, function, quality of life, and the number of patients who remain at home are important outcomes for patients, caregivers, geriatricians, and policymakers when considering the impact of geriatrician-led models of care in a systematic review.

What this study adds to what was known?

- Optimal methods to engage knowledge users in systematic reviews are unclear. This study describes a process to engage knowledge users from three provinces in Canada in the prioritization of outcomes and measures in a systematic review through the use of a modified Delphi to select outcomes and a cross-sectional survey to select measures.

What is the implication and what should change now?

- Engaging knowledge users in outcome and measure selection allows knowledge synthesis producers to tailor the review, which may facilitate the uptake of findings.

1. Background

Selection of outcomes and measures is a crucial component when conducting a systematic review; however, selecting outcomes is challenging because this will depend on knowledge users' (KUs') needs [1]. KUs use systematic review findings to make health care decisions; they can include patients, clinicians, policymakers, or researchers [2]. Choosing outcomes and/or measures that are not commonly used in practice or have not been validated could influence use of systematic review findings [2]. Engaging KUs in the selection of outcomes and measures for a systematic review may facilitate research use, by ensuring the end product is relevant to their needs [2].

Embedded within a systematic review to evaluate the comparative effectiveness of geriatrician-led models of care [3], a modified Delphi and a cross-sectional survey were conducted to inform selection of outcomes and their measures for inclusion in the systematic review. The systematic review was conducted using an integrated knowledge translation approach [2], which engages KUs throughout the process. To our knowledge, there is no established core outcome set [4] (i.e., agreed on outcome measures for use in clinical trials) or suggested outcomes or measures to assess the impact of geriatrician-led models of care. As such our goal was to identify outcomes and measures that

are most relevant for patients, caregivers, geriatricians, and policymakers when considering the impact of geriatrician-led care models. Preferred outcomes and measures were subsequently used to focus the systematic review.

2. Methods

Our study is funded by a Strategy for Patient-Oriented Research (SPOR) Knowledge Synthesis grant in Primary and Integrated Health Care Innovation. As a condition of funding, we partnered with collaborators in Alberta, Ontario, and Saskatchewan. A steering committee was established to guide the systematic review conduct; individuals who were leaders in their communities and had an interest in geriatric health care were invited to participate. Our committee included three citizens (aged 65 years or older) and two clinicians from three provinces (A.M., G.M., S.M., E.P., S.T.).

Our systematic review protocol was registered on PROSPERO (CRD42014014008) and published [3]. The systematic review included randomized controlled trials (RCTs) that assessed conduct of a comprehensive geriatric assessment (CGA) by a geriatrician targeted to adults >65 years of age. CGA is a multidisciplinary process focused on assessing and managing biomedical, psychosocial, functional, and social capacity of seniors [5,6]. Several electronic databases were searched from inception to November, 2016, to identify relevant articles. Two reviewers independently reviewed each citation and full-text article. Overall, 198 randomized controlled trials fulfilled eligibility criteria and were included in a charting exercise. One author (C.S.) documented the outcomes that were used to assess the impact of geriatrician-led care models and recorded the measure that was used to assess outcomes from the included articles. Information from the charting exercise informed the modified Delphi exercise and the cross-sectional survey.

2.1. Ethics

Ethical approval was obtained from St. Michael's Hospital (REB 16-320), Sunnybrook Health Sciences Centre (REB 122-2017), and the University of Toronto (REB 34044) before recruitment for the modified Delphi and the cross-sectional survey.

2.2. Phase 1—modified Delphi study

A modified Delphi, consisting of two rounds, was completed using Qualtrics, an online survey platform [7]. Delphi methods have been used previously in systematic reviews to prioritize findings [8,9]; however, we used these methods to prioritize outcomes and their measures before systematic review completion. Our goal was to identify

the outcomes that were most relevant for a diverse group of KUs.

2.2.1. Phase 1—modified Delphi participant recruitment

2.2.1.1. Patients and caregivers. Patients and caregivers were recruited in-person from geriatric outpatient clinics in Toronto, Ontario. Patients were eligible if they had a CGA within the last year, no cognitive impairment, and were able to communicate in English. No cognitive impairment was defined as a Mini-Mental State Examination (MMSE) [10] score ≥ 27 , the Montreal Cognitive Assessment [11] score ≥ 26 or the Rowland Universal Dementia Assessment Scale [12] score ≥ 22 . Caregivers were eligible if they cared for someone who had a CGA within the last year and were able to communicate in English. Caregivers were also approached through the SPOR PIHCI networks in the collaborating provinces. These networks are focused on supporting the conduct of patient-oriented research in each province and engage patients and caregivers in research.

2.2.1.2. Geriatricians. Geriatricians were recruited from the Division of Geriatric Medicine, University of Toronto, which is the largest Division of Geriatric Medicine in Canada [13]. Geriatricians were approached through an introductory email by the principal investigator (S.E.S.).

2.2.1.3. Policymakers. Policymakers and health care managers were recruited from Health Quality Ontario; the Ontario Regional Geriatric Program, Council of Academic Hospitals of Ontario, and SPOR PIHCI networks in the collaborating provinces. Health Quality Ontario is a provincial advisor on quality of health care and provides recommendations for quality improvement [14]. The Regional Geriatric Program of Ontario is a provincial network of specialized geriatric services, which aims to assess and treat older adults with complex needs [15]. The Council of Academic Hospitals of Ontario is composed of 23 research hospitals and seeks to advance patient-centered care and conducts evidence-based research [16].

Policymakers were defined as individuals not elected to their position and create or monitor policies or regulation of health care—related issues [17]. Health care managers were defined as individuals in managerial roles in a health care organization, such as managers at public health units, or clinical team leaders [17]. Local leaders within the respective organizations circulated an introductory email. SPOR PIHCI coordinators or network members sent us names of individuals who would be interested, or circulated our introductory emails.

2.2.2. Phase 1—data collection

Thirty-seven outcomes were identified in the charting exercise, but only those occurring in the literature more than five times were included in the modified Delphi. The rationale for this focus was to maximize the chances of

conducting a meta-analysis, as this was our analytic goal for the systematic review. Although only two studies are needed for a meta-analysis [18], we were conservative to increase the power of our statistical approach. As such, 27 unique outcomes were included in the modified Delphi exercise. A list of these outcomes, along with the frequency in which they were reported in the 198 RCTs is presented in Appendix 1.

The online modified Delphi survey was divided into two parts. First, participant characteristics (e.g., age, gender, province of residence) were collected; additional questions were tailored for each participant group (Appendix 2). Second, Delphi participants rated the 27 outcomes for importance using a seven-point adjectival scale ranging from “1-not at all important” to “7-extremely important” (Appendix 2). A brief description of the outcome and how frequently it was reported in the RCTs was presented. Outcomes with mean and/or median ratings greater than five were included in round two of the modified Delphi. Round 2 of the Delphi occurred a few months after the first round, and participants were asked to rate the preferred outcomes from round 1 (Appendix 3).

2.2.3. Phase 1—modified Delphi administration

To ensure face validity and feasibility, the modified Delphi survey was pilot-tested by members of the steering committee, and one external clinician and researcher. Reviewers and team members provided feedback using the Clinical Sensibility Questionnaire (CSQ) [19] and the modified Delphi survey was amended for clarity.

Modified Delphi participants received the survey link via an introductory email. Patients and caregivers had the option to complete the survey in-person or over the telephone to overcome difficulties using the online platform. Participation was voluntary and consent was implied if the participant began the survey. At any time, participants could close the browser or exit the survey. None of the questions were mandatory. Reminder emails were sent at 1 and 2 weeks after the initial email to optimize responses [20]. Participants were reimbursed for their time for each round of the modified Delphi (\$17.50 CAD per round).

2.2.4. Phase 1—modified Delphi analysis

Participant characteristics were summarized descriptively. Ratings for each outcome in the modified Delphi were converted to a value by calculating the means along with standard deviation (SD). Medians and interquartile ranges were also calculated to account for potential skewed data. For data interpretation, overall mean and median ratings were collapsed into three class intervals, “important”, “neutral”, and “not important”. Mean and median ratings ≥ 5 were considered “important,” ratings of four were considered neutral and ratings ≤ 3 were considered “not important”. Outcomes with overall mean and median scores ≥ 5 were included in round 2 of the modified Delphi and the same analytic methods were used. Partial or

incomplete responses were included in the analysis. All analyses were conducted in Excel, and results are reported as mean and SD unless otherwise reported.

2.3. Phase 2—cross-sectional survey to determine optimal measures of outcomes

The results of the modified Delphi were discussed with the steering committee and internal research group; the four highest-rated outcomes were included in the systematic review. Measures for these four outcomes were identified through the charting exercise. Only validated scales or measures were included; validity was defined as evidence of at least one type of validity (i.e., construct, content, concurrent, convergent, discriminant, or predictive validity). One author (C.S.) reviewed the measurement properties of each identified measure using a two-step process. First references citing the outcome measure in the included primary study were reviewed for validity evidence. If validity was not reported, a separate search was conducted in Medline to identify primary studies assessing validity of the outcome measure.

2.3.1. Phase 2—geriatrician recruitment

Geriatricians who participated in phase 1 were invited to participate in the survey. Only geriatricians were targeted, as patients, caregivers, and policymakers do not frequently use outcome measures. To increase response rate, an introductory email was circulated to all members of the Division of Geriatric Medicine, University of Toronto, through a listserv.

2.3.2. Phase 2—cross-sectional survey administration

The cross-sectional survey was created using the Qualtrics platform [7], pilot-tested by the steering committee using the CSQ [19] and modified accordingly. An introductory email was sent to eligible participants, which contained the survey link. Consent was implied if the participant completed the survey. Participants could close the browser at any time to exit the survey and none of the questions were mandatory. Participants were asked to rank their top three preferences for outcome measures from the list of validated outcome measures.

2.3.3. Phase 2—cross-sectional survey analysis

Results from the cross-sectional survey were analyzed using frequencies and the number of times a particular measure for an outcome was ranked as first, second, or third to determine the preferred outcome measures. All results were analyzed in Excel.

3. Results

3.1. Phase 1—modified Delphi findings

Overall, 33 individuals participated in round one of the modified Delphi, including two patients, five caregivers, 22 geriatricians, and four policymakers/health care managers (Table 1). All participants completed the survey online; it took approximately 15 minutes to complete. There were more female than male participants ($n = 23$ vs. $n = 10$) and most participants ($n = 26$) lived in Ontario (Table 1). Patients ($n = 2$) were aged 66 to 80 years and resided in Ontario, either with a family member or on their own. Caregivers ($n = 5$) were aged 36 to 80 years and most ($n = 3$) lived with other family members. Caregivers from three provinces participated in this project. Most geriatricians ($n = 16$) were aged 51 to 65 years and had been in practice for more than 15 years. Policymakers and health care managers ($n = 4$) were aged 51 to 65 years had been in their respective positions for <5 to 15 years and were mostly involved with local policymaking in urban areas.

In round one of the modified Delphi, participants rated 24 of the 27 outcomes as important, with mean ratings greater than five (Table 2). Function ($6.85 \pm \text{SD } 0.36$), cognition ($6.47 \pm \text{SD } 0.72$), and quality of life ($6.38 \pm \text{SD } 0.91$) were the highest-rated outcomes. The lowest-rated outcomes were morale ($4.93 \pm \text{SD } 1.46$), nurse visits ($4.71 \pm \text{SD } 1.42$), and length of stay in long-term care or a nursing home ($4.35 \pm \text{SD } 1.52$). Details on participant responses are available in Appendix 5. Sixteen outcomes had ratings in the “not at all important” to “very little importance” categories, whereas 11 outcomes were rated “neutral” to “extremely important” (Table 3).

Twenty-three of the 33 participants participated in round 2 of the modified Delphi and rated 24 outcomes. The highest-rated outcomes were function ($6.87 \pm \text{SD } 0.34$), cognition ($6.43 \pm \text{SD } 0.73$), quality of life ($6.45 \pm \text{SD } 1.10$), and number of patients able to remain at home

Table 1. Modified Delphi participant characteristics

Knowledge user	Number participated	Females	Males	Province		
				ONT	AB	SK
Patient	2	2	0	2	0	0
Caregiver	5	3	2	3	1	1
Geriatrician ^a	22	14	8	20	1	0
Policymaker	4	4	0	1	0	3

Abbreviations: AB, Alberta; ONT, Ontario; SK, Saskatchewan.

^a One geriatrician did not specify province.

Table 2. Summary of Delphi round 1 result

Outcome	Mean	SD	Median	IQR
Function	6.85	0.36	7.00	0.00
Cognitive ability	6.47	0.72	7.00	1.00
Quality of life	6.38	0.91	7.00	1.00
Number of patients who are able to remain at home	6.29	0.86	6.00	1.00
Caregiver burden	6.16	0.97	6.00	1.50
Mental health	6.13	0.96	6.00	1.00
Drugs prescribed	6.10	1.27	6.00	1.00
Complications	6.03	0.97	6.00	2.00
Admission to long-term care or nursing homes	6.03	1.21	6.00	2.00
Admission to the hospital or acute care	6.00	1.12	6.00	2.00
Falls	5.94	1.18	6.00	2.00
Use of health care resources or services at home	5.88	1.07	6.00	2.00
Admission to emergency room	5.87	1.09	6.00	2.00
Patient satisfaction	5.81	1.05	6.00	2.00
Length of stay in the hospital	5.79	1.19	6.00	2.00
Medication changes	5.70	1.37	6.00	2.00
Depression	5.58	1.06	5.00	1.50
Sleep problems	5.58	1.09	6.00	1.00
Allied health care provider visits	5.45	1.48	5.00	2.00
Nutrition	5.39	1.09	5.00	1.00
Mortality	5.28	1.40	5.00	1.00
Cost of health care resources or services	5.28	1.08	5.00	1.00
Outpatient visits	5.13	1.41	5.00	2.00
Primary care physician visits	5.03	1.56	5.00	2.00
Morale	4.93	1.46	5.00	2.00
Nurse visits	4.71	1.42	5.00	1.50
Length of stay in long-term care or nursing home	4.35	1.52	4.00	1.50

Abbreviations: IQR, interquartile range; SD, standard deviation.

(5.95 ± SD 1.17). The lowest-rated outcomes were outpatient visits (4.82 ± SD 1.05), primary care visits (4.91 ± 1.31), and mortality (5.00 ± 0.98). Details on the mean ratings from round 2 of the modified Delphi are provided in Appendix 6. The top four outcomes (function, cognition, quality of life, and number of patients living at home) did not change between rounds and were selected for inclusion in the systematic review.

3.2. Phase 2—cross-sectional survey results

Three of the prioritized outcomes (i.e., function, cognition, and quality of life) were included in phase 2. Overall, 12 validated outcome measures for function, quality of life, and cognition were included in the cross-sectional survey (Appendix 4).

A total of 22 geriatricians participated in the survey. Most geriatricians were female ($n = 14$ vs. $n = 9$) and most ($n = 9$) were in practice for 5–15 years (Table 4). For

function, Activities of Daily Living (ADL) was ranked first, while Instrumental Activities of Daily Living ranked second followed by the Short Physical Performance Battery (Table 5). For cognition, the MMSE was ranked first followed by the Clock Drawing Test and the Clinical Dementia Rating scale (Table 5). For quality of life, the Medical Outcomes Short Form (MOS SF-36/12) survey was ranked first followed by self-reported quality of life and the EuroQol-5D (Table 5). The top-ranked outcome measures for the selected outcomes were included in the systematic review.

4. Discussion

Engaging KUs such as patients in research has been an emerging topic in the clinical literature. One of the first successful examples of patient involvement in research were the OMERACT studies, which sought to identify a core

Table 3. Distribution of Delphi round 1 rating

Outcomes (number of responses)	Average group rating	Distribution of ratings (%)						
		1–Not at all important	2–Very little importance	3–Little importance	4–Neutral	5–Moderately important	6–Very important	7–Extremely important
Functional ability (33)	6.85	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	5 (15%)	28 (85%)
Cognitive ability (32)	6.47	0 (0%)	0 (0%)	0 (0%)	0 (0%)	4 (13%)	9 (28%)	19 (59%)
Quality of life (32)	6.38	0 (0%)	0 (0%)	0 (0%)	1 (2%)	6 (19%)	5 (16%)	20 (63%)
Living at home (31)	6.29	0 (0%)	0 (0%)	0 (0%)	2 (7%)	2 (7%)	12 (38%)	15 (48%)
Caregiver burden (31)	6.16	0 (0%)	0 (0%)	0 (0%)	2 (7%)	6 (19%)	8 (26%)	15 (48%)
Mental health (31)	6.13	0 (0%)	0 (0%)	0 (0%)	3 (10%)	3 (10%)	12 (38%)	13 (42%)
Drugs prescribed (30)	6.10	0 (0%)	1 (3%)	1 (3%)	2 (7%)	0 (0%)	12 (40%)	14 (47%)
Admission to long-term care (33)	6.03	0 (0%)	1 (3%)	0 (0%)	2 (6%)	7 (21%)	7 (21%)	16 (49%)
Complications (32)	6.03	0 (0%)	0 (0%)	0 (0%)	2 (6%)	8 (25%)	9 (28%)	13 (41%)
Admission to Acute Care (33)	6.00	0 (0%)	0 (0%)	1 (3%)	3 (9%)	5 (15%)	10 (30%)	14 (43%)
Falls (31)	5.94	0 (0%)	0 (0%)	1 (3%)	3 (10%)	7 (23%)	6 (19%)	14 (45%)
Resources at home (32)	5.88	0 (0%)	0 (0%)	1 (3%)	2 (6%)	8 (25%)	10 (31%)	11 (35%)
Admission to Emergency (31)	5.87	0 (0%)	0 (0%)	0 (0%)	5 (16%)	5 (16%)	10 (33%)	11 (35%)
Patient Satisfaction (31)	5.81	0 (0%)	0 (0%)	0 (0%)	3 (10%)	11 (35%)	6 (19%)	11 (35%)
Length of stay (33)	5.79	0 (0%)	0 (0%)	0 (0%)	7 (21%)	6 (19%)	7 (21%)	13 (39%)
Medication changes (30)	5.70	0 (0%)	1 (3%)	2 (7%)	0 (0%)	11 (37%)	4 (13%)	12 (40%)
Depression (31)	5.58	0 (0%)	0 (0%)	0 (0%)	5 (16%)	11 (35%)	7 (23%)	8 (26%)
Sleep problems (31)	5.58	0 (0%)	0 (0%)	2 (7%)	1 (3%)	12 (39%)	9 (29%)	7 (22%)
Allied health care provider visits (31)	5.45	1 (3%)	0 (0%)	2 (7%)	3 (10%)	10 (32%)	5 (16%)	10 (32%)
Nutrition (31)	5.39	0 (0%)	0 (0%)	1 (3%)	6 (19%)	9 (29%)	10 (32%)	5 (16%)
Cost of resources (32)	5.28	0 (0%)	0 (0%)	1 (3%)	6 (19%)	14 (44%)	5 (15%)	6 (19%)
Mortality (32)	5.28	1 (3%)	1 (3%)	0 (0%)	5 (16%)	10 (31%)	9 (28%)	6 (19%)
Outpatient visits (31)	5.13	0 (0%)	1 (3%)	4 (13%)	4 (13%)	9 (29%)	7 (22%)	6 (19%)
Primary care physician visits (31)	5.03	2 (7%)	0 (0%)	2 (7%)	5 (16%)	9 (29%)	8 (26%)	5 (16%)
Morale (30)	4.93	1 (3%)	1 (3%)	2 (7%)	6 (20%)	9 (30%)	7 (23%)	4 (13%)
Nurse visits (31)	4.71	0 (0%)	2 (7%)	5 (16%)	5 (16%)	11 (35%)	4 (13%)	4 (13%)
Length of stay in long-term care (31)	4.35	0 (0%)	4 (13%)	4 (13%)	11 (35%)	5 (16%)	3 (10%)	4 (13%)

outcomes set for use in primary studies of rheumatoid arthritis [21,22]. OMERACT included a diverse range of KUs such as clinicians, patients, and researchers who participated in a Delphi exercise and multiple focus groups. Their findings highlighted that patient input can enhance core outcome sets by considering outcomes that are relevant to their decision-making needs [23].

While research in patient engagement has focused on patient input in developing research priorities [24] and core outcome sets [25] for inclusion in primary research, there is also a need to engage patients in the conduct of systematic reviews. A recent scoping review identified that KUs are frequently engaged as key informants in meetings, workshops, or participate in surveys and focus groups in the

knowledge synthesis process [26]. Engaging KUs such as patients, clinicians, and policymakers in systematic reviews can have several benefits, such as improving review relevance and quality as well as increasing dissemination and uptake of findings [27]. Optimal methods to engage KUs in systematic reviews are currently unclear; however, using methods that elicit feedback such as through a modified Delphi and survey can facilitate engagement.

Outcomes selected in our study are aligned with those identified from a mixed methods study conducted by the International Consortium for Health Outcomes Measurement (ICHOM) [28]. The ICHOM study sought to identify global outcome measures that were relevant to older adults. The authors included an international panel of patient

Table 4. Cross-sectional survey participant characteristics

Females	Males	Years of practice		
		< 5 years	5-15 years	> 15 years
14	9	8	9	6

representatives, measurement experts, and researchers from various disciplines. They identified over 26 outcomes that were relevant to older adults; outcomes including cognition, health-related quality of life, ADLs, and ability to live at home were considered important by participants. Our study included a similar sample size; however, we uniquely included patients, caregivers, and policymakers across three provinces in Canada. Despite the differences in KUs, our findings are similar to the ICHOM study, thereby supporting the generalizability of our results.

Our project has several limitations. First, we had small numbers of patients and relative to the number of geriatricians. Most patients in the clinics had cognitive impairment and did not have a caregiver who was willing to participate or could not communicate in English, which accounted for low participation. It was not feasible to recruit from another site or province due to resource limitations. We also had a small number of policymakers despite various recruitment strategies. However, many of the participating geriatricians were also decision-makers for their organizations such as Regional Geriatrics Program of Ontario and thus, they brought this experience. Second, geriatricians were recruited from the University of Toronto, where the principal investigator is a division director. To avoid potential bias or coercion, the introductory email was circulated by administrative personnel through a listserv and the principal investigator did not know who participated in the study. Third, the outcomes that we included in the modified Delphi only included those that were reported in the literature more than five times. We used this approach to optimize the chance of conducting a meta-analysis. As a result, we may be missing potentially important outcomes to patients, caregivers, geriatricians, and policymakers. Fourth, the outcome measures used in the cross-sectional survey were identified from the literature and some were infrequently reported. As such, geriatricians may have selected measures that were frequently used in the literature or may have selected measures of which they had knowledge. Finally, our study relies on outcomes and measures used in primary studies; as such we were limited to outcomes and measures reported in the literature. Development of a core outcome set with engagement from patients and caregivers is needed to identify additional outcomes to assess the impact of geriatrician-led models of care.

5. Conclusions

We engaged patients, caregivers, geriatricians, and policymakers in the process of outcome selection to inform our

systematic review conduct, as part of our integrated knowledge translation approach. The highest-rated outcomes in the modified Delphi were function, cognition, quality of life, and number of patients living at home. Our findings indicate that patients and caregivers tended to value patient-level outcomes (e.g., ability to live at home, patient satisfaction), whereas geriatricians and policymakers tended to value health system level outcomes (e.g., length of stay in the hospital, primary care physician visits, falls)

Table 5. Ranking of outcome measures from cross-sectional survey

Scale	Ranked 1st	Ranked 2nd	Ranked 3rd
Function			
6 MWT	0	1	1
ADL	13	6	1
FIM	2	1	5
IADL	5	12	2
SPPB	1	0	6
TUGT	1	2	4
Cognition			
AMT	1	0	0
CERAD word list	0	1	0
CDR	1	4	7
CDT	1	9	3
CAM	0	2	3
IQoCDE	0	2	5
MDAS	0	1	0
MMSE	19	0	1
SPMS	0	3	2
Quality of Life			
AQL	1	0	0
EuroQoL (5D)	2	4	4
HRQoL (15D)	1	1	1
LS Index A	0	1	0
MOS (SF36/20)	13	2	1
NHP	0	1	1
Self-reported QoL	3	9	5

Abbreviations: 6MWT, 6 minute walking test; ADL, activities of daily living; AMT, abbreviated mental test; AQL, assessment of quality of life; CAM, confusion assessment method; CDR, clinical dementia rating scale; CDT, clock drawing test; FIM, functional independence measure; HRQoL (15D), Health-Related Quality of Life; IADL, instrumental activities of daily living; IQoCDE, informant questionnaire on cognitive decline in the elderly; LS Index, A life satisfaction index A; MDAS, memorial delirium scale; MMSE, mini-mental state examination; MOS (SF36/SF20), medical outcomes short form (SF36/20), Nottingham health profile; QoL, quality of life; SPMS, short portable mental status; SPPB, short physical performance battery; TUGT, timed up and go test.

Bolded items represent the scales that were ranked highest.

more highly but small sample sizes limit interpretation. Results from the cross-sectional survey showed that MMSE, ADLs, and MOS-SF36 were the highest ranked scales to assess selected outcomes.

The outcome measures prioritized by the KUs will be used to complete our systematic review. By engaging KUs in selection of review outcomes, we anticipate that our review findings will be more useful to them, thereby facilitating uptake. Our methods can be used by knowledge synthesis producers to facilitate the selection of the most relevant outcome measures.

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Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jclinepi.2019.02.005>.

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