Title: Assessing frailty indicators in the context of psychiatric disorder: A Delphi consensus study

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Abstract:

Objectives: Substantial construct overlap exists between indicators of frailty and symptoms of some psychiatric disorders. This study aimed to gain consensus of expert academic opinion on the potential impact of psychiatric illness on frailty assessment and how best to conceptualise and measure frailty indicators in the context of psychiatric symptoms.

Design: A classic Delphi approach was employed across two studies to achieve consensus: The first-round questionnaire consisted of open-ended questions, analysed through content analysis. The results informed the development of statements for participants to rate their agreement with in subsequent Delphi rounds. Statements with ≥66% agreement were accepted. Delphi Study 1 recruited experts in frailty assessment (n=13) and Delphi Study 2 recruited experts in frailty and psychiatric disorder (n=8). Experts were recruited globally.

Results: Overall, 40% of Delphi Study 1 statements and 43% of Delphi Study 2 statements were accepted. Primarily, consensus was reached for statements concerning the influence of depression/anxiety on frailty assessment and potential methods of conceptualising and measuring frailty indicators in the context of psychiatric symptoms. Little consensus was reached concerning the ease and importance of differentiating between frailty indicators and psychiatric assessment criteria with substantial overlap.

Conclusions: The Delphi studies provide a novel exploration and consensus of expert academic opinions concerning the assessment of frailty indicators in the context of psychiatric symptoms. The results will inform future research into the adaptation or development of a frailty assessment tool specifically for use in older adult psychiatric populations.

Key words: Frailty assessment, psychiatric disorder, older adults, Delphi study

Key points:

1) Through two expert Delphi studies, the impact of psychiatric symptoms on the assessment of frailty in older adults was explored, as was how best to measure frailty indicators in the context of psychiatric symptoms.

2) Consensus was reached for statements concerning the influence of depression/anxiety on frailty assessment and potential methods of measuring frailty indicators in the context of psychiatric symptoms.

3) Identifying co-morbid frailty in older adult psychiatric populations is vital for effective treatment planning and provision. The Delphi results will inform future developments in assessing frailty in such populations.

Introduction

The concept of frailty is frequently applied in older adult care to capture deteriorating health and functional decline. Its associated increased risks for adverse outcomes including mortality, falls and decreased functional independence are well evidenced [1-3]. Biologically, frailty represents a decline across multiple physiological systems, leading to reduced homeostatic capacity and diminished reserves and resilience to stressors [4, 5]. Several models have been proposed to conceptualize frailty; the two most widely recognized are the Cardiovascular Health Study Phenotype of Frailty Model [6] and the Canadian Study of Health and Aging Accumulation of Deficits Model [7]. The Phenotype of Frailty Model conceptualizes frailty as a clinical syndrome [6]. It details a physical frailty phenotype consisting of five frailty indicators: Unintentional weight loss, self-reported low activity levels, self-reported exhaustion, slow gait speed, and weak grip strength; with the presence of three or more indicators establishing frailty [6]. The Accumulation of Deficits Model views frailty as a clinical state caused by an accumulative burden of health deficits [7]. Frailty is measured via an index of age-related health deficits including diseases and disabilities. With no clear cut-off point to establish frailty, a higher index score is indicative of a higher level of frailty [7].

Frailty has significant implications in older adult psychiatric populations. Frailty and psychiatric disorders such as depression and anxiety are considered to be distinct but highly related clinical constructs [8-10], which have a high incidence of co-morbidity [10-12]. Further, evidence suggests that bi-directional associations exist between frailty and psychiatric disorders, with each being a risk factor for both the development, and poor prognosis, of the other [8, 10, 13-17]. This increased prevalence of frailty in the context of

psychiatric disorders and bi-directional associations between the two leads to greater associated risks for adverse outcomes, including falls, cognitive decline, institutionalisation and mortality [13, 15, 18]. Comorbid depressive disorder and frailty is associated with increased risk of non-remission of depressive symptoms, for example [19]. Given this, frailty in psychiatric populations requires specialist clinical assessment and intervention.

A recent review of frailty assessment tools found that no tool has been specifically developed for, or validated in, older adult psychiatric populations [20]. Therefore, evidence of the reliability and validity of each tool lacks interpretability and generalizability in relation to psychiatric populations. Further, substantial construct overlap has been identified between indicators of frailty as conceptualised in existing tools, and the Diagnostic and Statistical Manual of Mental Disorders (5th edition, DSM-5) diagnostic criteria for common psychiatric disorders [20, 21]. Of the 48 tools reviewed, 42% contained a psychological assessment domain, with 35% of tools specifically citing the presence of depression/anxiety as a frailty indicator [20]. The greatest level of overlap in assessment criteria was established in relation to: Major depressive disorder and generalized anxiety disorder. This was particularly observed in relation to the following indicators; unintentional weight loss, fatigue, and slowness [20]. Such indicators are frequently included in frailty assessment tools and are considered core components of the physical frailty construct [6].

Given these findings, this study aimed to gain consensus of expert academic opinion on the following: i) how symptoms of major depressive episode or generalised anxiety disorder may influence the assessment of frailty in older adults; ii) the potential importance of differentiating between indicators of frailty and symptoms of depression/anxiety for which

there is significant construct overlap; and iii) how the following indicators of frailty may best be conceptualised and measured in the context of psychiatric symptoms - unintentional weight loss, fatigue and slowness.

Methods

A classic Delphi approach [22] was employed. The Delphi method is considered a highly effective means of collecting and consolidating expert opinion in healthcare research [23]. Within that, the classic Delphi approach is considered optimal for generating new ideas on a topic for which little is known [23-26].

Selection and recruitment of an expert panel

Selecting a panel with the appropriate level of expertise that is heterogeneous in terms of participants' clinical/research backgrounds, but homogenous in terms of expertise in a specific area is essential for a robust Delphi study [23]. To allow for an exploration of two key perspectives, two separate Delphi studies were conducted in two clearly defined areas of expertise; frailty assessment (Study 1) and frailty in the context of psychiatric disorder (Study 2). Expert sampling, a form of purposive sampling, was employed. Experts were recruited globally and approached via email to establish their interest in participating. The inclusion criteria were:

Delphi Study 1: i) A peer-reviewed published author in the field of frailty assessment; and ii) experience in creating tools to assess frailty in older adults (aged ≥60 years) as evidenced in their published research.

Delphi Study 2: i) A peer-reviewed published author in the field of frailty in the context of psychiatric disorder; and ii) specialist research interest in frailty and psychiatric disorder in older adults (aged ≥60 years) as evidenced in their published research.

Design and analysis of Delphi study rounds

Delphi questionnaires were delivered online through Qualtric's survey platform [27]. Both studies were quasi-anonymous: Anonymity was maintained between participants at all times, however, due to the nature of Delphi study delivery, it was not possible for the lead researcher (JS) to be blinded. The design and analysis for each Delphi round followed the same process in Delphi Studies 1 and 2:

Delphi round one

In keeping with the classic Delphi approach, the first-round questionnaire consisted of five open-ended questions related directly to the study aims; see figure 1 for details. The questionnaire also detailed the DSM-5 diagnostic criteria for major depressive episode and generalised anxiety disorder [21]. It was piloted to ensure readability and feasibility. Round one responses were analysed through qualitative content analysis, supported by NVivo 10 software [28]. Major themes across the dataset were identified and all text excerpts were coded as statements. Statements that had the same meaning were collapsed and statements that were highly related were combined so long as the statements' original meaning could be retained. The wording of statements was kept as close as possible to participants' original responses. All statements and themes were reviewed by an independent researcher (RG), to ensure that no data were under or over-represented and that the themes correctly represented the coded statements.

Delphi round two

The second-round questionnaire comprised of the series of statements formulated in round one. Participants were asked to rate their agreement with each statement on a 7-point Likert scale (ranging from 1 = strongly disagree to 7 = strongly agree). Following each statement, there was space for participants to write comments, explaining their ratings. A pre-defined rating system was applied to establish the level of agreement between participants, with each Delphi statement classified into one of four categories. Table 1 provides full details of the rating system.

Statements with a strong consensus, as defined by the rating system, were accepted, whilst statements with no consensus were further reviewed. If it was evident from participants' comments that non-consensus was due to a lack of clarity with respect to the meaning of the statement, then the wording of the statement was changed to ensure clarity. This process was checked by an independent researcher (RG). Following this analysis, each participant was provided with an individualised feedback document. This detailed: i) the scoring system for establishing consensus; ii) the list of statements for which strong consensus was achieved in round two; and iii) feedback for each statement with moderate, low or no consensus. Feedback included the anonymised group ratings for each statement, the participant's own rating within this, and anonymised comments from all participants for each statement. Participants were invited to amend their rating after considering the group response in order to move towards a consensus in round three.

Delphi round three

The third-round questionnaire consisted of the statements from round two that had met with moderate, low and no agreement. Participants could again rate their agreement with

the statements on the same 7-point Likert scale, with an additional space for comments. Participants were informed that this was the final Delphi round and encouraged to explain their reasoning if their scoring for a statement remained outside of the group consensus. Statements with strong or moderate consensus (i.e. ≥66% of scores ≤ 2 or ≥ 6) were accepted.

Ethical approvals

Approvals were granted from King's College London Psychiatry, Nursing and Midwifery Research Ethics Subcommittee/NHS Research Ethics Committee (Reference: LRS-15/16-1996).

Results

Participants

Thirteen participants were recruited to Delphi Study 1 and eight participants were recruited to Delphi Study 2. Table 2 provides a full outline of participant demographics.

Response rates and timelines

The total response rate was 92% (8% drop out rate) in Delphi Study 1 and 75% (25% drop out rate) in Delphi Study 2. The Delphi study timelines and response rates per Delphi round are summarised in figure 2.

Delphi round 1, 2 and 3 responses

Fifty-five statements were generated across nine themes in Delphi Study 1. In Delphi Study 2 sixty-five statements were generated across eleven themes. Accepted consensus was reached overall for 40.0% (22/55) of Delphi Study 1 statements and 43.1% (28/65) of Delphi

Study 2 statements. Figure 3 outlines the number of statements per round with strong, moderate, low and no consensus for each Delphi Study. Table 3 provides a full summary of all accepted statements (i.e. with strong or moderate consensus).

The themes with the greatest level of consensus were: 'Treatment and interventions' (100%), 'Differing pathophysiology, risk factors and determinants (mental health vs. frailty)' (75.0%) and 'Influence and interactions (between depression/anxiety and frailty)' (75.0%) in Delphi Study 1 and 'Influence and interactions (between depression/anxiety and frailty)' (100%) and 'Miscellaneous' (containing statements that did not fit into the main themes - 85.7%) in Delphi Study 2.

The themes which had the lowest level of consensus across both Delphi studies were: 'Importance of differentiating between symptoms with construct overlap' (0.0% in both Delphi studies) and 'How possible is it to differentiate between symptoms with construct overlap' (11.1% in Delphi Study 1, 0.0% in Delphi Study 2). Table 4 provides a full outline of the level of consensus achieved per theme.

Discussion

This study provides a novel, in-depth, exploration of how best to assess frailty indicators in the context of psychiatric disorder. Through two Delphi panels, one with expertise in frailty assessment and one with expertise in frailty and psychiatric disorder, two key perspectives have been explored. Both Delphi studies had low attrition rates, with 8% total dropout in Delphi Study 1 and 25% total dropout in Delphi Study 2. The response rate for every Delphi round remained >70%, which is considered optimal [23, 29]. Additionally, there were no missing Delphi questionnaire responses further increasing rigour.

An initial aim of the Delphi studies was to explore how, in a wider sense, the symptoms of depression or anxiety may impact on frailty assessment. Their potential impact on an individual's performance in, and engagement with, the frailty assessment process was examined. Participants in both Delphi studies agreed that reduced energy and psychomotor changes are likely to influence any performance-based tests and assessments of physical activity incorporated in existing frailty assessment tools. Sleep disorders associated with depression and anxiety were also deemed likely to influence the evaluation of physical frailty indicators. Further, reduced communication associated with depressive disorders was identified as a potential barrier in engagement in the frailty assessment process. Delphi Study 2 participants agreed that the emotional symptoms of depression or anxiety (e.g., disinterest, negative cognitions) will likely influence a person's subjective report of their symptoms of frailty and impair their performance in objective performance-based tests. Delphi Study 1 participants agreed that depression or anxiety may negatively impact on an older adult's motivation or willingness to engage with a frailty assessment.

Participants observed that identification of frailty in the context of psychiatric disorder requires consideration of the relationships between the two. Reflective of the current literature, participants in both Delphi studies agreed that the relationship between depression/anxiety and frailty can be unidirectional or bidirectional, with each being potential risk factors for each other [15]. In exploring this further, participants agreed that fatigue associated with depression/anxiety can be a major influence on frailty and vice-versa. The impact of reduced energy or reduced activity associated with depression in accelerating sarcopenia from muscle disuse was also emphasised. Overall, Delphi participants agreed that frailty and psychiatric disorder are distinct but overlapping constructs - which again is reflective of current literature [8-10]. Specifically, Delphi Study 1

participants agreed that whilst some of the constructs of anxiety, depression and frailty may overlap, their causes, determinants and consequences may differ. Delphi Study 2 participants highlighted the differing aetiologies and potential treatments for both depression/anxiety and frailty.

A further aim of the Delphi studies was to explore the importance of differentiating between indicators of frailty and symptoms of depression/anxiety with significant construct overlap. Consensus was not achieved in 6/6 statements (3 per Delphi study) directly exploring this. Participants reported that the importance of making this differentiation is dependent on how frailty is conceptualised and whether psychiatric illness is viewed as part of the frailty construct. Delphi Study 2 participants agreed that if frailty is conceptualised under the Accumulation of Deficits Model [7], construct overlap between frailty indicators and indicators of depression/anxiety is not important as according to this model it is the number of deficits, not their origin, that is important. Further per this model, depression can be one of the characteristics that constitutes frailty. Conversely, Delphi Study 1 participants agreed that the impact of construct overlap may be significant in applying tools based on the Phenotype of Frailty Model [6] (as somatic symptoms of depression/anxiety are core frailty indicators in this model). This is of particular importance given that literature concerning frailty and psychiatric disorder advocates the use of the Phenotype of Frailty Model [6] to conceptualise frailty [19, 30].

Consensus was also reached for statements indirectly exploring the importance of this differentiation in relation to treatment. Delphi Study 2 participants agreed that it is important to distinguish between frailty and psychiatric illnesses overall because the treatment of them differs, while Delphi Study 1 participants agreed that failing to do so

could risk neglecting potentially modifiable factors. This reflects previous research which outlines the importance of identifying and treating comorbid frailty and psychiatric disorder, considering the combined impact of both on clinical presentation [19, 30].

Largely, there was a lack of consensus concerning how possible it is to differentiate between the indicators of frailty and of depression/anxiety for which there is significant construct overlap. Comments accompanying participants' scoring detailed uncertainty associated with it being a new area of research (with no existing data to guide participant opinion) and perceived complexity of doing so (e.g. establishing whether fatigue is due to physical frailty, psychiatric illness or complex interactions between the two).

The final aim of this study was to specifically explore how the following indicators of frailty may best be measured in the context of psychiatric symptoms: Unintentional weight loss, fatigue and slowness. To the authors' knowledge, this is the first exploration of potential strategies to do so. Consensus was reached for 7/25 statements. In Delphi Study 1, participants agreed that establishing the reasons attributed to an indicator (e.g. by self-report/by proxy) could be a helpful strategy in trying to differentiate between indicators associated with depression/anxiety and those associated with frailty. Similarly, in Delphi Study 2, participants agreed that establishing the perceived cause of an indicator maybe a helpful strategy.

Delphi Study 1 participants agreed that examining the cause of an indicator (e.g. through medical history/examinations) and diagnosis by exclusion (i.e. a diagnosis reached by a process of elimination) could be helpful in differentiating between indicators associated with depression/anxiety and those associated with frailty. Delphi Study 2 participants also agreed that an assessment of the presence and constellation of other symptoms of

depression (e.g. low mood), anxiety (e.g. intrusive worries or concerns) or frailty (other elements of frailty models) could be helpful strategies. Finally, participants agreed in relation to fatigue that: i) differentiating an 'amotivational state' from a lack of physical energy capacity; and ii) the development and dynamics of fatigue as a symptom, may provide valuable information. The affective dimensions of the fatigue presentation in major depression (including decreased motivation) are well established [31].

Implications and future research directions

Participants agreed on a wide range of depression and anxiety symptoms that have potential to impact on an individual's performance in, and engagement with, the frailty assessment process and some of the mechanisms in which they may do so. This is of value in considering the best means of assessing frailty in the context of psychiatric disorder in both clinical and research settings. Further, consensus was reached for a limited number of statements concerning how unintentional weight loss, fatigue and slowness may best be measured in the context of psychiatric symptoms to minimise construct overlap. This will support future research into the adaptation or development of a frailty assessment tool specifically for use in older adult psychiatric populations. This is a particularly important area of research as these indicators are common to tools based on both the Accumulation of Deficits and Phenotype of Frailty models [20].

The use of the Phenotype of Frailty Model to conceptualise frailty in psychiatric populations is advocated in the frailty literature as it has well evidenced clinical (and theoretical) specificity for the identification of physical frailty [30]. Additionally, unlike other prominent frailty models, it does not include psychological domains and/or psychiatric diagnoses as part of the frailty construct [6, 7, 20, 32], reducing the potential for confounded frailty

assessment when applied in psychiatric populations. Delphi participants agreed that the operational criteria of frailty and depression/anxiety overlap, particularly in relation to the Phenotype of Frailty Model [6]. This phenomenon is well evidenced [11, 33] and should be a consideration in adapting or developing a frailty assessment tool for use in psychiatric populations.

Finally, the expert opinions sampled asserted the importance of identifying frailty in the context of psychiatric illness and vice versa to support effective treatment planning and provision. Given the comorbidity of frailty and psychiatric disorder and the increased risks of adverse outcomes associated with this comorbidity (including worsening of frailty and psychiatric symptoms), an integrated approach to treatment is vital [19, 30]. As frailty is considered reversible, treating co-morbid frailty in the context of depressive disorder for example, is seen as a promising novel approach in treating frail-depressed older adults [19, 34].

Limitations

The sample for Delphi Study 1 consisted of a high proportion of males and post-doctoral researchers with medical training, somewhat limiting the heterogeneity of the sample and generalisability of the findings. The sample sizes for Delphi Study 1 (n=13) and Delphi Study 2 (n=8) were small, but considered acceptable, as recommended Delphi sample sizes range from 8 to 15 participants when highly specialist subject areas are explored [26].

Only 40% of Delphi Study 1 statements and 43% Delphi of Study 2 statements were accepted. It is possible that a greater level of consensus could have been achieved if a fourth Delphi round was completed. However, as Delphi studies are time and labour intensive, a fourth round would likely have resulted in a greater rate of attrition [24, 35]. Additionally,

the qualitative data highlighted areas where participants had opposing views and consensus was deemed unlikely (e.g. in applying different frameworks and models to conceptualise frailty). Further, the level of consensus achieved appears reflective of existing Delphi consensus literature concerning frailty; for example, a large scale Delphi study seeking to gain consensus on an operational definition of frailty accepted 29.1% of statements [36] and a Delphi study exploring acute care frailty assessment accepted 38.7% of statements [37].

For the purposes of this study, a predefined level of accepted consensus was set at ≥66% of ratings of ≤2 or ≥6 on a 7-point Likert scale (ranging from 1 [Strongly Disagree] to 7 [Strongly agree]). In the Delphi study literature, 70% is considered an ideal cut off point for reaching consensus [24, 29]. However, given the number of participants included in each Delphi study and the heterogeneity of expert views on the frailty construct, a cut-off point of 66% was deemed appropriate. This was further supported by the aims of the Delphi study being purely exploratory to inform new ideas (e.g. of potential means of conceptualising and measuring frailty indicators). Finally, this study captured consensus on high agreement/disagreement only (i.e. strongly agree/disagree and agree/disagree corresponding to ratings of ≤2 or ≥6 on the 7-point Likert scale). If for example all participants scored '5 [Slightly agree]' on the seven-point Likert scale, this is not classified as having reached a consensus. The methodology applied, however, is the most widely used in Delphi research.

Conclusion

The results of the Delphi studies provide a valuable exploration and consensus of expert academic opinions concerning the assessment of frailty in the context of psychiatric disorders. An accepted level of consensus was reached for 40.0% of Delphi Study 1

statements and 43.1% of Delphi Study 2 statements overall. This will inform future research into the assessment of frailty in older adult psychiatric settings, including the adaptation or development of a frailty assessment tool specifically for use in this population.

Authors contribution

The research objectives, concept and design were formulated by Jennifer L. Sutton, Rebecca L. Gould and Robert J. Howard. The research was led and managed by Jennifer L. Sutton. Data analysis was completed by Jennifer L. Sutton and Rebecca L. Gould. Preparation of manuscript was completed by Jennifer L. Sutton. Rebecca L. Gould and Robert J. Howard reviewed and edited the manuscript.

Disclosure/conflict of interest

The authors report no conflicts with any product mentioned or concept discussed in this article.

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Table 1: Criteria to establish consensus in Delphi Study 1 and 2

Level of consensus	**Scoring**
Strong	>80% of scores ≤ 2 or ≥ 6
Moderate	66-80% of scores ≤ 2 or ≥ 6
Low	50-65% of scores ≤ 2 or ≥ 6
No	<50% of scores ≤ 2 or ≥ 6

Footnote: Scores of ≤ 2 = strongly disagree/disagree. Scores of ≥ 6 = agree/strongly agree.

Table 2: Participant demographics in Delphi Study 1 and 2

Demographics		**Delphi Study 1**	**Delphi Study 2**
Sex	Female	3	4
	Male	10	4
Country	Australia	-	1
	Belgium	1	-
	Canada	-	1
	France	2	-
	Holland	1	-
	Italy	1	-
	Netherlands	4	1
	United Kingdom	2	1
	United States of America	2	4
Research role	Professor	3	3
	Assistant Professor	1	1
	Senior Lecturer/Fellow	2	2
	Post-doctoral Researcher	7	2
Professional background	Clinical Psychology	1	1
	Doctor of Medicine	6	4
	Nursing	3	-
	Physiotherapy	1	1
	Research only (not applicable)	2	2

Table 3: Delphi study 1 & 2 - accepted statements with strong to moderate consensus

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
How possible is it to differentiate between symptoms with construct overlap?	1	Although fatigue may be the same whether it is a symptom of depression or an indicator of frailty; determining whether it's due to depression or associated with frailty may be very difficult.	1 8.33	10 83.33	Strong
Differing pathophysiology, risk factors and determinants (mental health vs. frailty)	1	Frailty has a sustained negative impact on a person's functional ability over time whereas depression and anxiety may not.	10 83.33	0 0.00	Strong
	1	Some of the constructs of anxiety, depression and frailty may overlap, however, their causes,	0 0.00	11 91.67	Strong

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		determinants and consequences may differ.			
	1	**From a clinical perspective it is important to know if a functional change is a result of acute stress or a slowly occurring condition.**	**0 0.00**	**12 92.31**	**Strong**
Impact of mental health on frailty assessment (excluding construct overlap)	1	It is likely that sleep disorders associated with depression and anxiety will influence the evaluation of physical frailty indicators such as fatigue and slowness.	1 8.33	9 75.0	Moderate
	1	It is likely that the presence of depression/anxiety will influence an older adult's ability to answer questions and perform tests as part of a frailty assessment.	1 8.33	8 66.67	Moderate

Theme	**Delphi study**	**Statement**	**Responses ≤2 (Strongly disagree or disagree)** **N** **%**	**Responses ≥6 (Strongly agree or agree)** **N** **%**	**Level of consensus**
	1	**Psychomotor retardation associated with depression may influence the results of performance-based tests such as gait speed, grip strength, Timed Up and Go Test.**	**0** **0.00**	**12** **92.31**	**Strong**
	1	It is likely that the presence of depression and anxiety may influence an older adult's motivation or willingness to engage with a frailty assessment.	0 0.00	8 66.67	Moderate
	1	Major depressive episode may reduce communication skills which may impact on the assessment of frailty.	0 0.00	10 83.33	Strong
	1	It is likely that the symptoms of depression and	0 0.00	10 83.33	Strong

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		anxiety will influence a subjective assessment of frailty.			
	1	**Symptoms of depression and anxiety may influence an objective assessment of frailty.**	**0 0.00**	**11 84.61**	**Strong**
	2	It is likely that the emotional symptoms of depression or anxiety (e.g., negative cognitions, disinterest) will impair a person's ability to perform to the best of their abilities on objective performance tests.	0 0.00	4 66.66	Moderate
	2	It is likely that the emotional symptoms of depression or anxiety (e.g., negative cognitions, disinterest) will impact a person's ability to	0 0.00	4 66.66	Moderate

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		accurately provide a subjective report of the symptoms of frailty.			
Influence and interactions (between depression/anxiety and frailty)	1	There may be some interaction between the causal mechanisms of overlapping symptoms/indicators of depression, anxiety or frailty.	0 0.00	11 91.67	Strong
	1	**Depression and anxiety can be contributing factors to unintentional weight loss, fatigue and slowness.**	**0 0.00**	**13 100.0**	**Strong**
	1	**Fatigue can be a major influence on depression and anxiety and vice versa.**	**0 0.00**	**12 92.31**	**Strong**
	2	**Reduced energy or activity, as is common in**	**0 0.00**	**7 100.0**	**Strong**

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		depression, may accelerate ageing and sarcopenia from muscle disuse.			
	2	There is likely to be a bidirectional causal relationship between depressive disorders and characteristics of frailty.	0 0.00	5 83.33	Strong
	2	**Depression/anxiety and frailty can be bidirectional or unidirectional risk factors for each other.**	**0 0.00**	**6 85.71**	**Strong**
	2	As the relationship between frailty and depression is bidirectional, a cohesive management plan in the presence of either syndrome may necessitate the identification of	0 0.00	6 85.71	Strong

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		either syndrome individually.			
	2	The comorbidity of depression/anxiety with frailty may point to different underlying etiologies and potential treatments for both.	0 0.00	4 66.66	Moderate
The importance of how frailty is conceptualised (model and tool)	**1**	**The influence of symptoms of depression and anxiety on the assessment of frailty is dependent on the assessment methods or frailty instrument utilised.**	**0 0.00**	**12 92.31**	**Strong**
	1	**If you assess frailty using a tool based on the Phenotype of Frailty Model then the symptoms of depression and anxiety may impact significantly on the assessment of frailty.**	**1 8.33**	**11 84.61**	**Strong**

Theme	**Delphi study**	**Statement**	**Responses ≤2 (Strongly disagree or disagree)** **N %**	**Responses ≥6 (Strongly agree or agree)** **N %**	**Level of consensus**
	2	**The characteristics that make up a frailty syndrome can be caused by a general physical deterioration or specific illnesses, of which depression can be one.**	**0 0.00**	**6 85.71**	**Strong**
	2	When frailty is conceptualised under the Accumulation of Deficits model, construct overlap between indicators of frailty and symptoms of depression/anxiety is not important as according to this model it is the number of deficits, not the origin of the deficits that is important.	1 16.66	4 66.66	Moderate
	2	Anxiety symptoms may have a less direct	0 0.00	4 66.66	Moderate

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		influence on the assessment of frailty using currently available frailty assessment tools compared to the symptoms of depression.			
Influence of construct overlap on frailty assessment (general)	2	Loss of energy and psychomotor changes, be it retardation or activation, are likely to influence any assessment of daily physical activity included in existing frailty assessment tools.	0 0.00	5 83.33	Strong
	2	It is likely that the presence of depression or anxiety will increase a frailty score in models where weight loss, exhaustion and reduced activity are incorporated.	1 16.66	5 83.33	Strong

Theme	**Delphi study**	**Statement**	**Responses ≤2 (Strongly disagree or disagree)** **N** **%**	**Responses ≥6 (Strongly agree or agree)** **N** **%**	**Level of consensus**
Influence of overlap in identifying and classifying psychiatric disorder	2	The most commonly utilised depression and anxiety diagnostic criteria (e.g. DSM-5 and ICD-10) are specified in such a way that the indicators of frailty alone would not qualify an individual to be diagnosed with depression or anxiety.	0 0.00	4 66.66	Moderate
	2	Mental health diagnoses may be missed because symptoms are incorrectly ascribed to frailty.	0 0.00	4 66.66	Moderate
Treatment and interventions	**1**	**Appropriate treatment of depression or anxiety is likely to improve health status as a whole and thus improve frailty trajectories.**	**0 0.00**	**12 92.31**	**Strong**
	1	Failure to distinguish symptoms of depression/anxiety from indicators of frailty	1 8.33	8 66.67	Moderate

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		could risk neglecting potentially modifiable factors.			
	2	It is important to distinguish between frailty and psychiatric illnesses because the treatment of them differs.	1 16.66	5 83.33	Strong
	2	Lack of appropriate treatment due to not differentiating symptoms of depression and anxiety from indicators of frailty may complicate the course of other existing medical conditions.	0 0.00	5 83.33	Strong
	2	Specific treatment of depression or anxiety could help to target and improve some of the symptoms for which there is construct overlap	0 0.00	4 66.66	Moderate

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		with frailty indicators, leading to a shedding of frailty deficits.			
Strategies to differentiate (fatigue/weight loss/slowness)	1	Establishing the reasons attributed to unintentional weight loss, fatigue or slowness could be a helpful strategy in trying to differentiate between those symptoms/indicators due to depression/anxiety and those associated with frailty.	1 8.33	10 83.33	Strong
	1	Diagnosis 'per exclusionem' (i.e. a diagnosis reached by a process of elimination) could be a helpful strategy in differentiating between fatigue, unintentional weight loss and slowness	0 0.00	8 66.67	Moderate

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		associated with depression/anxiety and those symptoms/indicators associated with frailty.			
	1	An examination of the main causes of unintentional weight loss (e.g. illness, surgery, stressful life events) could indicate if the cause of unintentional weight loss is physical or psychological.	0 0.00	9 75.0	Moderate
	2	In differentiating between fatigue associated with depression/anxiety and fatigue associated with frailty it is useful to differentiate an amotivational state from a lack of energy capacity.	0 0.00	5 83.33	Strong
	2	The development and dynamics of fatigue as a	0 0.00	5 83.33	Strong

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		symptom may provide information on whether to subscribe fatigue to frailty or to depression/anxiety.			
	2	An assessment of the presence and constellation of other symptoms of depression (e.g. low mood), anxiety (e.g. intrusive worries or concerns) or frailty (other elements of frailty models) may be helpful in differentiating between fatigue/unintentional weight loss/slowness associated with depression/anxiety and those symptoms/indicators associated with frailty.	0 0.00	4 66.66	Moderate

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
	2	Establishing the perceived cause of unintentional weight loss is likely to a useful strategy in differentiating between unintentional weight loss associated with frailty and unintentional weight loss associated with depression.	0 0.00	4 66.66	Moderate
Construct overlap in other areas (excluding weight loss, slowness and fatigue).	1	An older adult may experience a profound decline in physical performance due to depression or anxiety which could indicate a degree of unrecognised frailty.	1 8.33	8 66.67	Moderate
	2	Decreased activity may be present in older adults with depression; this represents one of the commonly used signs and symptoms to describe	0 0.00	5 83.33	Strong

Theme	**Delphi study**	**Statement**	**Responses ≤2 (Strongly disagree or disagree)** **N %**	**Responses ≥6 (Strongly agree or agree)** **N %**	**Level of consensus**
		frailty and so represents a potential area of construct overlap.			
Miscellaneous	**2**	**Frailty should only be assessed if an individual does not have a current active diagnosis of depression.**	**6 85.71**	**1 14.29**	**Strong**
	2	Frailty, depression and anxiety may share common risk factors which could influence the assessment of frailty.	0 0.00	6 85.71	Strong
	2	A "diagnosis" of frailty, as a stand-alone condition, has limited utility.	5 83.33	0 0.00	Strong
	2	**None of the symptoms associated with depression, or indicators of frailty, have 100%**	**0 0.00**	**7 100.0**	**Strong**

Theme	Delphi study	Statement	Responses ≤2 (Strongly disagree or disagree) N %	Responses ≥6 (Strongly agree or agree) N %	Level of consensus
		specificity so it's important to review all symptoms/indicators together.			
	2	**It is likely that a frail older adult could be misdiagnosed as depressed; for instance when an individual presents with frailty and low mood.**	**1 14.29**	**6 85.71**	**Strong**
	2	There is potentially a frail-depressed or frail-anxious subtype of frailty	0 0.00	4 66.66	Moderate

Key: Statements highlighted in bold type were agreed in the second Delphi Round.

Table 4: Level of consensus achieved per theme in Delphi study 1 and 2

Theme	**Delphi Study 1 Statements**		**Delphi Study 2 Statements**	
	Total	**Accepted n (%)**	**Total**	**Accepted n (%)**
How possible is it to differentiate between symptoms of depression/anxiety and indicators of frailty with construct overlap?	9	1 (11.1)	12	0 (0.0)
Importance of differentiating between symptoms of depression/anxiety and indicators of frailty with construct overlap.	3	0 (0.0)	3	0 (0.0)
Differing pathophysiology, risk factors and determinants (mental health vs. frailty).	4	3 (75.0)	-	-
Impact of mental health on frailty assessment (excluding established construct overlap).	12	7 (58.3)	3	2 (66.6)
Influence and interactions (between depression/anxiety and frailty).	4	3 (75.0)	5	5 (100)
The importance of how frailty is conceptualised (model and tool).	4	2 (50.0)	5	3 (60.0)
Influence of construct overlap on frailty assessment (general)	-	-	6	2 (33.3)

Theme	Delphi Study 1 Statements		Delphi Study 2 Statements	
	Total	**Accepted n (%)**	**Total**	**Accepted n (%)**
Influence of construct overlap in identifying and classifying psychiatric disorder	-	-	3	2 (66.6)
Treatment and interventions	2	2 (100)	7	3 (42.8)
Strategies to differentiate (fatigue/weight loss/slowness).	14	3 (21.4)	11	4 (36.4)
Construct overlap in areas excluding weight loss, slowness and fatigue.	3	1 (33.3)	3	1 (33.3)
Miscellaneous	-	-	7	6 (85.7)

Key: '-' = theme did not apply in Delphi study. Statements that were accepted were those that achieved strong to moderate consensus across the 3 Delphi rounds.

Figure 1: Delphi Study 1 and 2 – round one questions

Round 1 Questions
1. How may the symptoms of depression or anxiety influence the assessment of frailty in an older adult? 2. Why may it be important to differentiate between symptoms of both frailty and depression/anxiety for which there is significant construct overlap? If it's not important then please indicate why. 3. How possible is it to differentiate between fatigue due to depression/anxiety and fatigue due to frailty in the context of frailty assessment? How might one go about this? 4. How possible is it to differentiate between unintentional weight loss due to depression/anxiety and unintentional weight loss due to frailty in the context of frailty assessment? How might one go about this? 5. How possible is it to differentiate between psychomotor retardation due to depression and slowness of movement due to frailty in the context of frailty assessment? How might one go about this?

Figure 2: Delphi Study 1 and 2 - timelines and response rates per Delphi round

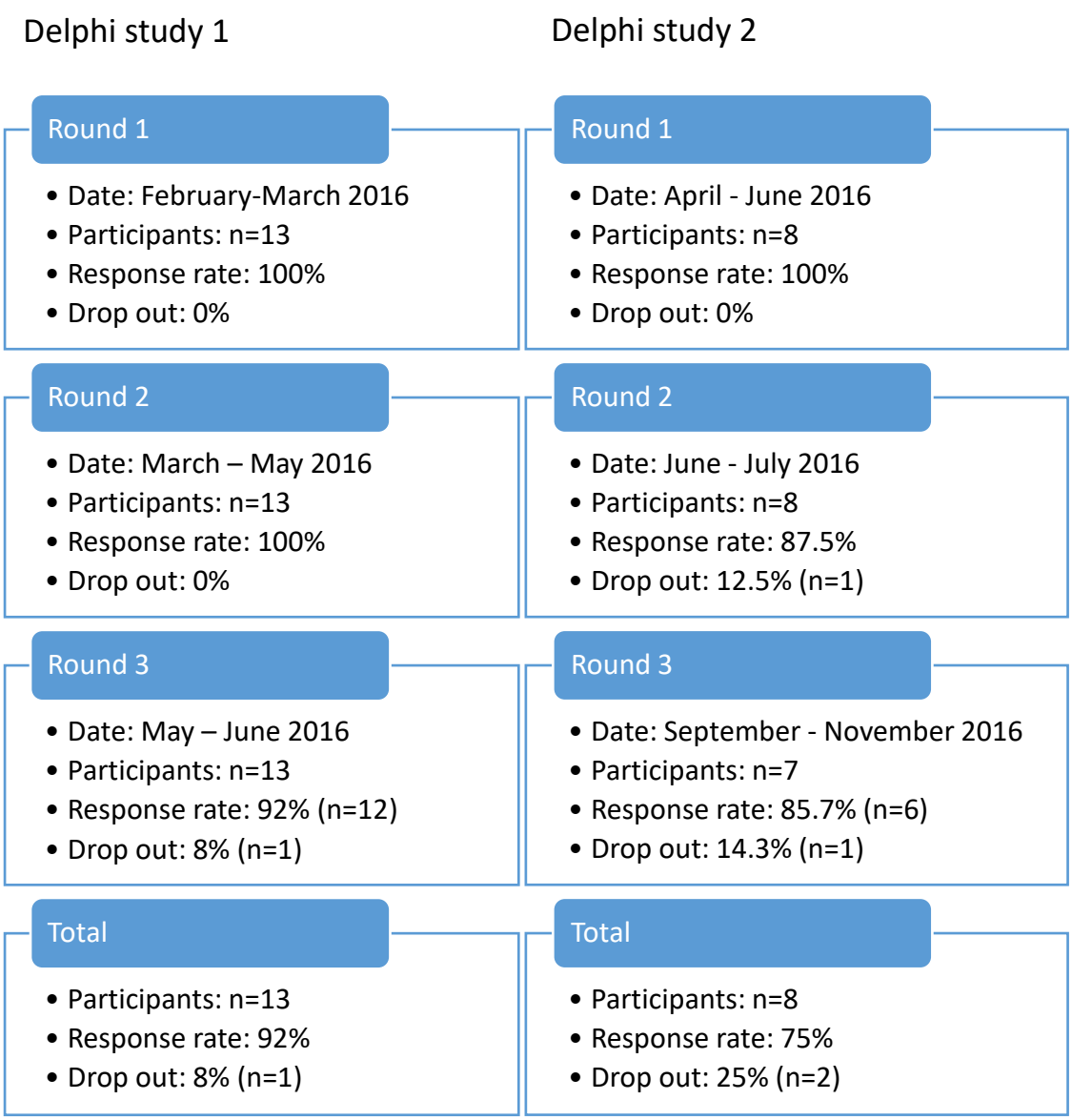

Figure 3: Delphi Study 1 and 2 - number of statements with the level of consensus reached per Delphi round