

Clinical Trial

Attitudes of Healthcare Staff Related to Using Point of Care Ultrasound for Frailty Assessment, A Qualitative Study

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ABSTRACT

Frailty is a common syndrome in older adults that informs many aspects of patient care. Recent studies suggest that point-of-care ultrasound (POCUS) may be useful in bedside frailty assessment by identifying muscle characteristics associated with frailty such as decreased muscle thickness and increased intramuscular fat.

To explore current perspectives on using POCUS in frailty assessment as well as frailty assessment practices, we conducted semi-structured interviews with 22 interdisciplinary staff in a specialized geriatrics unit. Responses were coded and analyzed to inductively determine common themes.

Frailty definitions and assessment methods varied widely across and within disciplines. Patient cooperation and time were perceived as main barriers to frailty assessment. Objective measures were not employed by most participants. Most participants were familiar with POCUS and thought it could be helpful to assess frailty. Reported potential barriers to implementation included time, cost, training, and patient cooperation. POCUS offers objective evidence of frailty in hospitalized older adults who are often unable to fully participate in standardized frailty assessments. This qualitative study highlights a need for standardization and objectivity in current practice while identifying practical considerations for implementing POCUS.

KEYWORDS: frailty; assessment; qualitative; hospitalizations; ultrasound; interdisciplinary

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INTRODUCTION

Frailty is a syndrome characterized by declines in reserve and physical function across multiple physiologic systems, which causes increased vulnerability to adverse health outcomes such as falls, incident disability, hospitalization, and mortality [1,2]. The prevalence of frailty is estimated to be 12% in community dwelling older adults aged 65 years of age or older [3]. This rate increases with age and higher rates are observed in women, low socioeconomic status groups, and minoritized groups [3,4].

The pathophysiology of frailty is multifactorial. Sarcopenia, defined as the progressive loss of muscle mass and strength, plays a significant role in the progression of frailty [2]. Frailty is dynamic and potentially reversible—individuals may transition between different states of robustness, pre-frailty, or frailty. Several randomized controlled trials have demonstrated that dietary, physical, and cognitive interventions can reduce measures of physical frailty in older adults [5–8]. Therefore, identification of frailty across its trajectory, and particularly early in its progression, is of critical importance in that evidence-based interventions can be deployed to preserve quality of life, independence, and physical and cognitive function.

Various clinical assessment tools are available to assess frailty including the FRAIL scale [9], Fried's phenotype [10], cumulative deficit index [11], and the Clinical Frailty Scale [12]. These tools use a variety of different data points which can include functional tests such as walking speed and grip strength, standardized patient questions about functional status, and guidelines for making clinical judgements on a patient's degree of frailty. While these tools are easily accessible and usually incorporate objective data, they are limited in showing what is occurring on a physiological level [13]. Furthermore, clinical assessment tools can be difficult to complete in the acute hospital setting as older patients may have acute or chronic limitations in their ability to attend to interview or engage in physical function testing.

Use of bedside POCUS is increasing in clinical practice due to its ability to provide clinicians rapid objective information [14,15]. This information can be used to guide treatment and often results in improved patient outcomes and efficiency of patient care [16]. Common, well-established applications of POCUS include assessment of cardiac function [17], urinary retention [18], and skin and soft tissue pathologies [19]. An emerging application of POCUS is for evaluation of muscle characteristics. Muscle ultrasound can measure objective variables such as size, thickness, echointensity, and pennation angle which have been shown to strongly correlate with muscle function, sarcopenia, and validated measures of frailty [20–26]. Variables measured by POCUS have been shown to have good reliability and validity when compared to dual-energy X-ray absorptiometry (DEXA) [27]. While the ability to measure these characteristics is not unique to ultrasound, POCUS is more convenient and less costly than other imaging modalities such as DEXA, computed

tomography (CT), or magnetic resonance imaging (MRI), and can be conducted by individuals with minimal training. In addition, this modality is widely scalable, particularly in low-resource areas.

There is a growing body of evidence linking ultrasound-derived muscle characteristics to measures of frailty [24,25]. Recent studies also show an association of ultrasound muscle characteristics with various clinical outcomes such as length of hospitalization, readmission rate, and physical function [28–31]. With access to ultrasound machines and training increasing [14,15], it is possible that POCUS can be integrated into frailty assessment and determining if targeted interventions, such as physical and occupational therapy, and durable medical equipment, are warranted.

A recent study surveying chiefs of geriatrics clinics at Veteran's Affairs Medical Centers showed that 60% of chiefs would support implementation of POCUS into their practice [32]. This study identified lack of training and equipment as major barriers [32]. However, to our knowledge, the perspectives of interdisciplinary healthcare staff towards the application of POCUS for frailty assessment in older adults (ages 65 years and older) specifically have not been studied. To bridge the gap in the literature, we asked how healthcare staff currently define and assess for frailty as well as the existing barriers to frailty assessment and potential barriers to the use of POCUS in frailty assessment. The results of this study may be used to guide potential integration of POCUS as part of hospital frailty assessment.

METHODS

Study Design

A qualitative approach was chosen to maximize understanding of the vast interpretations of frailty relating to the care of older adults. This qualitative study employed semi-structured, in-person interviews following a standardized questionnaire with an interdisciplinary sample of healthcare staff. This study was deemed to be exempt from Institutional Review Board approval by the University of North Carolina Office of Research Ethics and requirement of informed consent was waived.

Study Setting

Interviews took place at UNC Hillsborough a 126-bed academic teaching hospital. The hospital consists of a 24 bed Acute Care for the Elderly (ACE) unit designed to reduce disability for older adults hospitalized for acute medical conditions [33].

Study Population

Twenty-two interdisciplinary staff members from the ACE unit were interviewed. Recruitment was performed via a convenience sample. Staff were approached with a brief description of the study during their shift and asked if they would like to participate. Verbal consent was obtained,

and the approximately 15-minute interview, consisting of both quantitative and qualitative questions (Appendices A and B), was performed by one of the two researchers (AW, HS). In-person interviews were recorded using Zoom audio recording software at the site of the interview and transcribed using an online transcription service. Adequate security measures including de-identification of data, full disclosure of data handling to participants, and storage on a password-protected computer were taken for each interview, aligning with institutional privacy policies. The interviews were reviewed by a single researcher (AW). In cases where the transcription was unclear, the text was corroborated with the original audio file.

Outcome Measures

Participants were asked a series of demographic questions followed by a brief quantitative questionnaire about their background and their view of frailty in their patient population (Appendix A). The interview then proceeded to open-ended questions regarding their perception of and attitude towards POCUS as well as their opinion on the viability of POCUS for the measurement of frailty (Appendix B).

Data Analysis

Transcripts were then imported into *Dedoose* (Sociocultural Research Consultants, Manhattan Beach, CA, USA) which allowed custom creation of codes connecting to common themes identified using an inductive approach during transcript review. These codes were then used as the foundation for analysis. After coding of all transcripts was completed, connected excerpts were reviewed and chosen as representative for certain main themes. The most representative quote for each sub-theme was chosen to be displayed in the results section after a narrative description for the respective sub-theme results. Additional quotes are displayed in Table 3. All interview transcripts and demographic data were entered into RedCap (Vanderbilt University, Nashville, TN, USA). Descriptive statistics evaluated all quantitative data and were integrated at the analytical stage.

RESULTS

Demographics

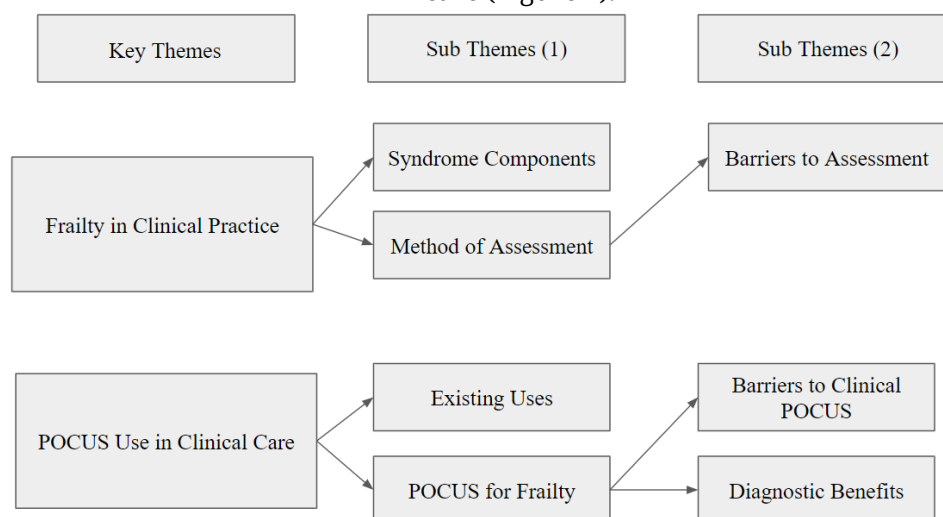
A total of 22 participants were recruited for this study. Participant demographics varied in age, years of practice, and occupation as outlined in Table 1.

Table 1. Self-reported participant demographic data.

Age	Years
Mean \pm σ	38.2 \pm 11.6
Range	24–60
Years of Practice	
Mean, Range	11.8, 1–37
Race	Count (%)
Caucasian	17 (77)
Black or African American	3 (14)
Other	2 (9)
Sex	Count (%)
Female	17 (77)
Male	5 (23)
Occupation	Count (%)
Nurse	7 (32)
Physician	5 (23)
Occupational therapist	3 (14)
Physical therapist	3 (14)
Medical assistant/Certified surgical technologist	3 (14)
Speech pathologist	1 (5)

Thematic Analysis

Two key areas for analysis identified through thematic analysis were defining frailty in clinical practice and the use of POCUS within clinical care (Figure 1).

**Figure 1.** Breakdown of key themes and sub-themes apparent during qualitative analysis of survey responses.

Defining Frailty in Clinical Practice

Syndrome Components

There was considerable variability in the participants' estimated proportion of their own patients who were categorized as having frailty, although most participants estimated that greater than 50% of their patients had frailty (Table 2). Nutritional deficits, described as low body weight or decreased caloric intake, were the most discussed components of frailty (Tables 2 and 3). Loss of independence with intrinsic and

extrinsic activities of daily living were also often discussed as key components of frailty (Tables 2 and 3). Weakness was also commonly identified as a component of frailty and thought to be a risk factor for downstream complications in the form of more frequent falls (Tables 2 and 3).

Nurse: Low nutritional intake, inability to complete ADLs independently, weakness, decreased mobility. I don't want to say skinny but like decreased muscle mass.

Table 2. Quantitative survey responses.

Question	Answers	Count (%)
^ What proportion of your patients are older adults?	25–49%	4 (18)
	50–74%	4 (18)
	75–100%	14 (64)
^ What proportion of older adults would you consider frail?	0–24%	5 (23)
	25–49%	4 (18)
	50–74%	8 (36)
	75–100%	5 (23)
* What does frailty mean to you in the context of older adults?	Nutritional deficits	10
	Loss of independence	9
	Weakness	9
Do you currently assess frailty in your patients and if so which assessment tools do you use?	No assessment	8 (36)
	Observation only	7 (32)
	Some objective measure (fall risk, Braden score, etc)	7 (32)
* What are some barriers to frailty assessment?	Patient cooperation	6
	Time	5
	Skipped	5
Describe your perception of the use of POCUS in your field.	Familiar	20 (91)
	Unfamiliar	2 (9)
* What are some barriers to use of POCUS for frailty measurement?	Time	6
	Cost	5
	Training	4
	Patient cooperation	4
	Skipped	4
Do you think using POCUS could be helpful in assessment of frailty?	Positive	12 (57)
	Neutral	7 (33)
	Negative	2 (10)

^ Some healthcare staff on the ACE unit also rotate on other units and may have included patients on other units in their estimation of proportion of older adults and frailty prevalence; * Open ended prompt where responses were categorized into common themes, some participants provided responses that contributed to multiple categories. Commonly mentioned themes are listed.

Table 3. Additional quotes not listed in results.

Question	Additional Quotes
* What does frailty mean to you in the context of older adults?	<p><u>Physical Therapist</u>: Their strength, motion, their balance, quality of their movement.</p> <p><u>Physician</u>: I would describe frailty as a patient with multiple comorbidities who has decreased physiologic reserve to insult, who is losing weight and decreasing functional decline without obvious other organic cause.</p> <p><u>Physical Therapist</u>: Maybe they weren't eating or they were losing weight. Maybe they often get dizzy, if they were standing up and couldn't move around and do a lot, you need more help at home from others. And then maybe also like, their prognosis here in the hospital might not be too good. They maybe more towards the end of life, I would say.</p> <p><u>Occupational Therapist</u>: Yes, I would say thinking about frail, thinking smaller in stature, smaller and frame, not able to hold themselves up right. Moving slowly, needing more assistance.</p>

Do you currently assess frailty in your patients and if so which assessment tools do you use?	<p><u>Medical assistant:</u> I don't really [assess frailty]. I do ask family, connections, if [the patient] can't answer for themselves.</p> <p><u>Nurse:</u> Like assessing their frail risk or assessing their brain score, ways that you would assess for frailty and their nutritional status.</p> <p><u>Physical Therapist:</u> We kind of look at [patients], [their] muscle strength, their balance when they're walking, when they're standing at the sink to brush their teeth.</p> <p><u>Nurse:</u> We ask about if they're able to move around independently or if they're pretty sedentary just to determine their fall risk or their brain score and then visual assessment.</p> <p><u>Physician:</u> I do not. I don't.</p>
* What are some barriers to frailty assessment?	<p><u>Physician:</u> I think lack of resources, inevitably lack of time, it's hard to do a 15-meter walk test in the clinic when they're there all the time.</p> <p><u>Nurse:</u> Mostly for older adults, their altered mental status. That would be the biggest thing. Not that it impacts my ability because if they're altered, it kind of tells me that they might not be eating as much as they said they are. They might not be doing as much as they say they are.</p> <p><u>Physician:</u> Probably time is usually the greatest barrier to completing standardized assessment.</p> <p><u>Nurse:</u> I mean staffing. If there's a chance that we can have up to six patients.</p> <p><u>Nurse:</u> Mainly it's just whether the patient wants to participate. If they push you away and you're not getting a lot of interaction.</p>
Describe your perception of the use of POCUS in your field.	<p><u>Physical Therapist:</u> I used to think that are ultrasound like fluid pockets and I'm like, right, so doctors are going to decide what to do with that fluid pocket</p> <p><u>Physician:</u> On the inpatient side, both to make treatment decisions and to monitor progress in patients. In the outpatient setting, it's being used more. We just had a great example of this being able to just throw the probe on the patient's chest and get an answer that she needed to go to the emergency department then could not wait for an outpatient echo.</p>
* What are some barriers to use of POCUS for frailty measurement?	<p><u>Nurse:</u> I think that the cooperation of the patient—I mean, bladder scans can be difficult if your patient is resistant.</p> <p><u>Physical Therapist:</u> Maybe just training, like training, how to use it and what they're looking for. How to exactly measure it, I guess.</p> <p><u>Nurse:</u> Again, time pressures as well as equipment costs as well as equipment maintenance.</p> <p><u>Physician:</u> I just think time becomes the biggest constraint. If frailty is the problem, but you have all these other acute problems that you're trying to work up, I wonder it would get pushed off doing the focus to actually make that assessment.</p>
Do you think using POCUS could be helpful in assessment of frailty?	<p><u>Medical Assistant:</u> You don't know until you come and try it, I guess. It could be, if it is accurate.</p> <p><u>Physician:</u> I don't have a framework for that. You have for frailty you get loss of muscle. Theoretically look at new muscle, but I don't, I would not know how to do that.</p> <p><u>Nurse:</u> I don't know because I mean, it's been just basically the subjective kind of assessment for so long, I don't really have an objection to it.</p> <p><u>Nurse:</u> I don't know what it would change but cost wise, it's like benefit versus risk of is it worth it or could we use that somewhere else? But I don't have any judgement against it, but I don't know...</p> <p><u>Occupational Therapist:</u> Not really an opinion, but I could definitely see it being an added tool. Yes. I guess a positive potential.</p> <p><u>Physician:</u> I guess I don't really understand exactly what I would use it for, so like better understanding that would probably be helpful. I don't know. Specifically, what you would look for.</p> <p><u>Nurse:</u> I don't know what it would change but cost wise, it's like benefit versus risk of is it worth it or could we use that somewhere else? But I don't have any judgement against it, but I don't know...</p> <p><u>Occupational Therapist:</u> That's a good idea, I think, DEXA but the faster one, I guess, would be the ultrasound.</p>

* Open ended prompt where responses were categorized into common themes, some participants provided responses that contributed to multiple categories. Commonly mentioned themes are listed.

Method of Assessment

One third of participants did not perform any type of frailty assessment, one third assessed frailty in their patients using observation only, and one third used an objective assessment such as fall risk or Braden score (Table 2). Across all disciplines and within disciplines with multiple participants,

there was considerable variability as to whether participants assessed for frailty and what method they used, if any (Table 3). There was no consistent assessment that was applied by those who used objective assessment.

Occupational Therapist: Not definitely not formally by any means, but seeing how someone moves around out of bed and in bed, how move around in bed if they're able to, manage their blankets, things like that.

Barriers to Assessment

The most common barrier to frailty assessment was patient cooperation (Tables 2 and 3). Many participants noted that in their experience, patients often do not wish to or have the capacity to participate in frailty assessments. Time was another major barrier (Tables 2 and 3). Many of the daily requirements of being hospitalized are tedious; including early morning lab draws, repeated imaging, and even medication administration; but these inconveniences lead to direct benefits, such as improving labs showing that a patient is ready to be discharged. Participants were hesitant to add another to-do list item without clear benefit.

Medical Assistant: You want to see what they can and can't do. They can't get out of the bed, you're not going to try and force them to get out of bed.

POCUS in Clinical Care

Existing Uses

Almost all participants were familiar with some applications of POCUS in their field, though not specifically for frailty (Table 2). The most familiar uses to participants included placing difficult intravenous catheters, scanning bladders, and assessing volume status (Table 3). Participants also noted that ultrasound is used regularly in the outpatient setting for therapeutic rather than diagnostic purposes (Table 3).

Nurse: Yes, we use ultrasounds frequently for placing IVs in difficult patients for scanning bladders.

POCUS for Assessing Frailty

When prompted with the idea of using POCUS to assess frailty, participants responded with curiosity (Table 3). Participants were interested to know what measurements would go into the calculation and the evidence behind the validity of those measurements (Table 3). They also had questions about how long the assessment would take, and who would be performing the assessment.

Physical Therapist: I think it could be useful, and I don't have any knowledge. I can see that. because actually, they call it skinny fat. Somebody could look fit, but have literally no muscles mass. Absolutely.

Perceived Potential Utility of POCUS for Frailty

When asked if they thought POCUS could be helpful in frailty assessment or change their management of their patients, ~57% of participants responded positively, ~33% responded neutrally and ~10% responded negatively (Table 2). Given that participants did not know how this assessment was conducted or the validity of the results, any perceived benefits should be taken in the context of this unfamiliarity. The participants who responded positively mentioned the lower cost, faster results, and less invasive nature of ultrasound as reasons why they thought ultrasound to assess frailty could improve patient care (Table 3).

Physician: Yes, it certainly is better than ordering a CT scan of the lower extremity. Yes, I think getting an ultrasound would be very helpful, not invasive for relatively low cost.

Barriers to POCUS for Frailty

Time was considered a significant potential barrier to assessment (Tables 2 and 3). Participants stated feeling overwhelmed and overworked. The idea of adding yet another task to their day was not appealing, especially given concern about the validity and exact clinical consequences of the measurement. Many expressed doubts about the logistics of who would perform the scan and how the results would be interpreted. Training and patient cooperation were cited as other barriers to this form of assessment (Tables 2 and 3).

Cost was another barrier (Tables 2 and 3). Hospital stays commonly involve expensive monitoring and imaging, and participants are reluctant to add another study to the list. They were also concerned that there were insufficient number of ultrasound machines in the hospital to accommodate another indication for POCUS.

Nurse: I would say probably cost, because I mean, we've been begging for an ultrasound to put in for IVs for the four, for six years now and we still haven't gotten that. Staffing. Because would this be like a provider assessment, or would it be another nursing assessment?

DISCUSSION

Among our sample, there was little agreement on the definition of frailty and the method used to assess frailty across and within different disciplines. While numerous well-described and validated methods exist for assessing frailty, most participants did not employ standardized methods. There was no consistently applied assessment among those who did use a standardized method. In line with the heterogeneity in participants' definition and method of assessing frailty, there was also considerable variation in the estimated prevalence of frailty in older adults. These results indicate the need for a standardized approach to assessment that could identify frailty in more patients allowing for otherwise unrealized opportunities to intervene.

Based on our results, older patients in the hospital setting have acute or chronic limitations in their ability to complete physical function tests and answer questions appropriately. Our interviews demonstrated that participants often deferred conducting frailty assessments on patients with limited cooperation due to having many other tasks requiring their time that potentially were more pressing. POCUS has the advantage of requiring less patient cooperation compared to other objective measures of frailty that often require functional testing. Furthermore, while POCUS does require time to conduct, it is quicker than other imaging modalities like CT, MRI, or DEXA. It is currently unclear whether utility of musculoskeletal POCUS justifies the time and resource investment. Future studies should evaluate the time commitment of obtaining the necessary data required for such objective measurements.

Identifying a patient's frailty status in the hospital setting can directly impact patient care through guiding decisions to initiate interventions such as nutritional support, fall risk precautions, and physical and occupational therapy evaluation [34]. Knowing frailty status also influences disposition planning by pre-emptively addressing functional limitations with increased social support and rehabilitation services arranged at time of discharge [34]. Musculoskeletal POCUS represents a trainable skill that can be performed bedside with minimal patient cooperation that may help improve and individualize care plans [25].

With the use of and training for POCUS increasing over recent years, more applications of the technology are emerging [14,15]. There is a growing body of evidence suggesting that POCUS may be useful in identifying changes in muscle structure by accurately measuring muscle characteristics such as muscle thickness and echointensity [23–25,27]. There is also a potential role for POCUS in predicting clinical outcomes [29–31]. Thus, POCUS could become an additional screening tool for frailty or its components, helping clinicians to decide which hospitalized patients need more comprehensive evaluations and/or interventions to mitigate frailty-related adverse outcomes. Should POCUS be integrated into frailty and geriatric assessments, we have identified potential facilitating factors and barriers to its implementation.

Participants were largely familiar with clinical applications of POCUS, although not specifically for assessing muscle characteristics related to frailty. While most expressed a positive view of its potential utility, there were also questions about the evidence behind the technique as well as who could perform the scans and how long they took. Staff identified barriers including time constraints, cost, staff training, and patient cooperation—issues that are also shared by internists regarding POCUS [34]. Overall, it seemed that while our sample was generally receptive to the potential adoption of POCUS in frailty assessment, the implementation of this practice in the hospital setting would require stronger evidence of utility as well as adequate reduction of barriers.

Limitations of our study include a predominance of Caucasian and female participants in the sample. Furthermore, interview transcripts were coded by a single researcher. Saturation in responses was not achieved and while some core themes were elucidated, responses varied widely due to the small sample size. Generalizability is also somewhat limited given recruitment from a single, specialized hospital unit. Lastly, our study addressed the perspectives of healthcare staff towards POCUS rather than the perspectives of patients. Since our study found that healthcare staff perceived patient cooperation as a barrier to both frailty assessment and POCUS, it will be important for future studies to address their perspective.

While some participants did not strictly work in the ACE unit, a core strength of our study is that the participants had specific training and experience in the care of older adults. As a result, they were more familiar with frailty and its impact on patient care. Furthermore, our study is the first to use qualitative methods to investigate current practices and perspectives regarding frailty assessment as well as perspectives towards the use of POCUS as part of frailty assessment. Results from our study may help healthcare organizations implement standardized frailty assessments, with or without the use of POCUS, to enhance the comprehensive care of older adults.

As the potential utility of POCUS in muscle function/frailty assessment is investigated, there is a need for more broadly assessing perceptions of POCUS use for frailty assessment, in both inpatient and outpatient settings. Our findings suggest that standardized imaging protocols are important for adoption of POCUS for frailty assessment. Protocols needed include which muscles to image, ideal patient and probe positioning, and methods of image analysis. Future studies need to compare clinical outcomes from POCUS-aided frailty assessment and currently used methods of frailty assessment. Most importantly, education on the importance of identifying and managing the risks of frailty in clinical practice must continue and expand across all settings that work with older patients, as early identification allows for greater opportunity to reduce the progression and risks of frailty.

ETHICAL STATEMENT

Ethics Approval

This study was deemed to be exempt from Institutional Review Board approval by the University of North Carolina Office of Research Ethics. An information sheet was provided to participants who all participated in interviews voluntarily. Adequate measures were taken to protect data, all following institutional procedures.

Requirement of informed consent was waived. All participants participated voluntarily in interviews after being informed about the

study. Adequate measures were taken to protect data, all following institutional procedures.

Declaration of Helsinki STROBE Reporting Guideline

This study adhered to the Helsinki Declaration.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, MW, upon reasonable request.

AUTHOR CONTRIBUTIONS

ALW, HBS, DHL, and JAB conceptualized this study; ALW, HBS, DHL, and JAB developed study methodology; ALW and HBS conducted the study interviews and recorded data; ALW, HBS, and MW managed and maintained the study data; ALW, HBS, MW, and RD conducted the formal analysis of the study data; HBS, DHL, and JAB provided supervision and mentorship for this project; DHL and JAB provided key resources and access to study participants; ALW and MW led visualization and presentation of the results; ALW, MW, HBS, and JAB wrote the initial manuscript draft; MW, HBS, JAB, DHL, and RD reviewed and edited the manuscript up to submission; All authors approved this manuscript to be published; All authors agreed to be accountable for all aspects of the work.

CONFLICTS INTEREST

Ria Dancel is a consultant for Lippincott Procedures and Wolters-Kluwer publishing.

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APPENDIX A

Quantitative Questionnaire:

- I. What is your age?
- II. What is your sex?
- III. What is your race?
- IV. How many years have you been practicing (in your respective field)?
- V. What is your current profession?
- VI. What is your current work location?
- VII. What proportion of your patients are older adults (>65)?
- VIII. What proportion of older adults would you consider “frail”?

APPENDIX B

Qualitative Questionnaire:

- I. Please briefly describe what frailty means to you in the context of your older patients.
- II. What are some synonyms that you use for frailty, if any?
- III. How do you currently assess frailty in their older patients in your specific clinical setting?
- IV. Do you have a specific assessment you use for frailty?
- V. Can you share with me how an objective frailty assessment may impact how you approach a patient’s care plan?
- VI. What are the barriers to assessing frailty?
- VII. Describe your perception of the use of “point of care ultrasound” in your field.
- VIII. Are you aware of any situations in your field where POCUS is being used? What/where are they?
- IX. What is the perception of ultrasound as a method of assessing frailty?
- X. If you had the ability to use ultrasound in your practice, how do you think it could be used in the diagnosis of frailty?
- XI. What would be the barriers to using POCUS in your clinical setting?
- XII. What clinical questions do you think you could answer using POCUS in your field?

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