J Rehabil Med 2019; 51: xx–xx

LETTER TO THE EDITOR

Check for updates

SELECTING THE BEST MEASURE FOR HOSPITAL-ACQUIRED DECONDITIONING

We note with interest the recent systematic review by Gordon et al. (1) regarding assessment instruments to evaluate hospital-acquired deconditioning (HAD). Precipitated by immobility and inactivity during hospitalization, HAD is associated with poor outcomes, such as decreased quality of life and reduced survival (2). Early, accurate, and routine assessment of patients' functioning could facilitate timely identification and treatment of patients at risk for HAD. In this light, the systematic review by Gordon et al. is welcome and needed to guide this area of clinical practice.

Their methodology for identification of publications about measurement instruments was theoretically driven and clear. They then used the International Center for Allied Health Evidence (iCAHE) Ready Reckoner (3) to evaluate the psychometric properties and clinical utility of the 7 assessment instruments identified through their search. Given this excellent methodology, we were surprised to note that publications that establish the psychometric properties and clinical utility of some of the assessment instruments were not included. After closely examining and repeating some of their search, inclusion and exclusion criteria, it appears that the exclusion criterion "did not describe the assessment instrument" may have eliminated several key papers. Possibly as a consequence of this criterion, but not explicitly stated, only one published manuscript for each of the instruments was included. While an understandable exclusion to focus on foundational publications, authors will regularly describe an instrument and report some psychometric testing in an initial publication and then reference that detailed instrument description in subsequent papers that report other psychometric attributes without repeating the description. We consider that this led to iCAHE Ready Reckoner scores being artificially low for some instruments.

For example, the article included for the Activity Measure for Post-Acute Care (AM-PAC) was only about its validity and so it was scored as zero (0) in all the reliability categories (i.e. inter-tester, intra-tester, test-retest, and internal consistency). This may have been due to published studies on AM-PAC reliability that do not contain a detailed description of the instrument being excluded (4). In addition, cut-off scores and normative values for AM-PAC were scored as zero (0), possibly due to these values being in yet other excluded publications (5). Omissions such as these led the authors to conclude that 5 of the included instruments had not been tested for reliability. The purpose of our effort here is to provide readers with the references that include all published psychometric attributes of the included instruments and update the iCAHE Ready Reckoner with these modifications (Table I).

Table I. International Center for Allied Health Evidence (iCAHE) Ready Reckoner Checklist

	TUG (7, 8)	PPT	NSIC (9, 10)	SPPB (11, 12)	MNA (13–17)	DEMMI (18)	AM-PAC "6-clicks" (4, 5, 19–23)
Validity							
Face	1	1	1	1	1	1	1
Content	1	1	1	1	0	1	1
Construct	1	1	1	1	1	1	1
Comparison	1	1	1[a]	1	1	1	1[a]
Sensitivity	1	1	1	1	1	1	1
Factors	1[a]	0	1	1	1[a]	1[a]	1
Reliability							
Inter-tester	1	1	0	1[a]	1[a]	1	1[a]
Intra-tester	1	0	1	0	0	1	1[a]
Test-retest	1	0	0	1[a]	1[a]	1	1[a]
Internal consistency	1	1	0	1	1	1	1[a]
Clinical utility							
< 20 items	1	1	1	1	1	1	1
Number of items	14	7	10	5	18	15	6
Manual scoring	1	1	1	1	1	1	1
< 15 min admin time	1	1	1	1	1	1	1
Estimated time, min	< 10	10	5–7	15	15	5–9	5
Norms	1	0	1	1	1	0	1[a]
Cut-off scores	1	1	1[a]	1	1[a]	0	1[a]
Appropriate to Australia	1	1	1	1	1	1	1
No cost	1	1	1	1	1	1	1
No registration/limitations	1	1	1	1	1	1	1
Total (proposed new score)	18	14	15	17	16	16	18
%Total (new score)	95	74	79	89	84	84	95
Total (according to Gordon et al.)	17	14	13	15	12	15	11
%Total (according to Gordon et al.)	89	74	68	79	63	79	58

[a]Denotes items that were modified in this version.
TUG: Timed Up and Go Test; PPT: Physical Performance Test; NSIC: Nutrition Screening Initiative Checklist; SPPB: Short Physical Performance Battery; MNA: Mini Nutritional Assessment; DEMMI: de Morton Mobility Index; AM-PAC 6 Clicks: Activity Measure for Post-Acute Care (AM-PAC '6 Clicks').

doi: 10.2340/16501977-2617

Table II. Summary of recommended measures by domains

	Instruments							Total instruments	Recommended instrument (Gordon et al.)	Updated recommendation
	TUG	PPT	NSIC	SPPB	MNA	DEMMI	AM-PAC "6 clicks"			
Total iCAHE score										
Proposed new score	18	14	15	17	16	16	18	–	–	–
Gordon	17	14	13	15	12	15	11			
Domains assessed										
Muscle strength	1	1		1		1	1	5	TUG	TUG & AM-PAC
Aerobic capacity/fitness/respiratory function	1			1		1	1	4	TUG	TUG & AM-PAC
Vasomotor stability and/or balance	1	1		1		1		4	TUG	TUG
Anthropometrics					1			1	MNA	MNA
Skin integrity				1				1	SPPB	SPPB
Mobility	1	1		1	1		1	5	TUG	TUG & AM-PAC
Activities of daily living		1	1		1		1	4	PPT	AM-PAC
Walking distance	1	1		1	1			4	TUG	TUG
Gait speed	1	1		1				3	TUG	TUG
Appetite			1		1			2	NSIC	MNA
Incontinence								0	--	--

In line with the original review, we did not include studies if their objective was to describe psychometric properties for specific conditions or diseases or if the psychometric testing occurred within an experimental study. Also, we searched databases up to September 2019, which lead to the inclusion of articles that were not published at the time of the search by Gordon et al.

Gordon et al. initially concluded that only 2 assessment instruments scored well in reliability (i.e. Time Up and Go (TUG) and the De Morton Mobility Index (DEMMI)). We found that, in addition to those instruments, the AM-PAC also has high reliability. In terms of norms and cut-offs we found that the Nutrition Screening Initiative Checklist (NSIC), the Mini Nutritional Assessment (MNA) and the AM-PAC also reported these parameters. After these additions, the total iCAHE Ready Reckoner scores changed for all measures except the Physical Performance Test (PPT), which lead to 5 measures having scores above 16 (>80% of the items).

After making these changes to the iCAHE Ready Reckoner scores, there are situations in which we come to different conclusions and recommendations about measuring HAD (Table II). For example, if clinicians were interested in finding the best tool to measure mobility and activities of daily living, they would consider the PPT, the MNA or the AM-PAC. Based on the results presented by Gordon et al., it would be intuitive for clinicians to select the PPT, since it has a higher score (i.e. better psychometric properties and clinical utility). However, if clinicians use our score, then the best option would be the AM-PAC, as it has 18/19 items present; specifically, all components of reliability have been evaluated, and both norms and cut-off scores have been published. Similarly, if clinicians were interested in the appetite domain, they would consider the NSIC or the MNA. In this case, clinicians might select the NSIC, given that the only difference between measures is that more validity constructs have been evaluated for the NSIC compared with the MNA. After our updates, it is apparent that the reliability of the MNA has been evaluated more extensively than the NSIC; hence, it may be more appropriate to select the MNA based on psychometric properties.

Measurement instruments with sound psychometric properties and clinical utility are particularly critical during acute hospital admission when HAD is likely to occur. In fact, HAD has been the focus of many initiatives, but there is still large variability in measures, definitions, and categorizations (6). Hence, the selection of tools that are valid, reliable, and of clinical utility help to ensure quality in research studies, as well as clinical care. We applaud the work of Gordon et al. and recommend their findings for identification of resources that can help measure a variety of domains relevant to HAD. We also suggest that the additional papers and revised iCAHE scores we provide on the instruments be included so that the most comprehensive assessment and selection can be made.

ACKNOWLEDGEMENTS

This research contribution was supported by the Foundation for Physical Therapy's Center of Excellence in Physical Therapy Health Services and Health Policy Research and Training Grant.

The authors have no conflicts of interest to declare.

Accepted Oct 16, 2019; Epub ahead of print Oct 23, 2019

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RESPONSE TO LETTER TO THE EDITOR: RESPONSE TO LETTER TO THE EDITOR FROM CAPO-LUGO ET AL

We thank Carmen Capo-Lugo, Erik H. Hoyer and Daniel Young for their support for our literature scan for a screening test battery for hospital-acquired deconditioning (HAD). We note that Hoyer et al. (5) recently published on the value of the AM-PAC, and this perhaps explains their specific interest in this instrument. We explained on p. 399 of our paper that we deliberately chose only the first paper published on the psychometric properties of each identified instrument. This was in the hope that the first report of psychometric testing for a new instrument would be comprehensive. We took this approach to limit the publication volume bias that would have been introduced had we included every paper published since instrument inception on its psychometric properties (24). For the TUGT, for instance, this would have involved 30 years of testing (including translation and testing of the TUGT into over 20 languages), whilst for newer instruments, such as the DEMMI, this would have involved fewer than 5 papers simply because of the recency of the research. We look forward to correspondence with other researchers interested in the other instruments we included in our screening battery, because the argument posed by this author team for the AM-PAC will apply to all other instruments. We are pleased that Capo-Lugo and co-authors. have joined their voices with ours for an efficient and effective screening approach for HAD, as unless this is detected early and addressed, the progression to disability and frailty is often inevitable.

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