Author’s response to reviews

Title: Construct Validity of the Dining Environment Audit Protocol: A Secondary Data Analysis of the Making Most of Mealtime (M3) Study

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Reviewer 1 Comments:

Abstract: Conclusions - incomplete sentence, "The construct validity of the DEAP was supported through significant correlations with a variety of measures that are theoretically related to the homeliness and functionality [of]." Response: this sentence has been fixed.

Introduction and/or Discussion sections - Significance of this study: In the United States, there have been culture change initiatives and newer dining practice standards for nursing homes, both of which have emphasized the importance of "resident-centered care practices" and a more "home-like environment" to enhance resident autonomy, choice and quality of life. The value of a tool, such as the DEAP, is that it offers nursing home care providers, federal and state regulators and researchers a more structured way to evaluate the extent to which an individual facility has made improvements in this area, at least as it relates to dining and the mealtime experience. Currently, most assessments rely instead on staff self-report and/or the subjective opinion of a select few to make this determination. The DEAP tool also could be useful in evaluating the impact of dining environments in specialized care settings, such as dementia care.
units in nursing homes or dementia care within residential care settings, on residents' oral intake and mealtime experience.

Response: Thank you for this comment. The value of DEAP is now more fully articulated in the Introduction and Discussion.

(a) It is stated that the observer completed the DEAP tool "once at the beginning of data collection for each home, when the dining room was empty". However, it seems that a number of DEAP components, particularly those related to functionality, could only be assessed during an actual mealtime when both residents and staff were present (e.g., noise level, staff response to resident requests, clutter/open pathways that may be blocked by wheelchairs, staff and/or meal tray carts during an actual meal service). Also, while staff and/or residents may have access to options within the environment itself (e.g., mixture of seating arrangements, seating in view of garden, adjustable tables, a place for beverage refills), they may (not) actually utilize these in daily care practice (e.g., staff may still seat all residents together in far corner and let others remain in their rooms for ease of care provision or still go to the kitchen for refills). Thus, a valid assessment of how the dining space is actually used when residents/staff are present during mealtime seems more important to capture in the observations to determine the validity of the tool.

Response: Thank you for this comment. DEAP is designed to only assess the physical features as they exist in a dining space. Thus, data are collected only on physical features as they statically exist without actors within the space. The Mealtime Scan also developed by this team, is focused on assessing the actual happenings and experience of the mealtime and captures how physical space (e.g. size of dining room based on number of residents present) impacts noise, social interactions etc. Below is the reference on the development of the Mealtime Scan.


(b) What was the rationale for conducting only one observation per dining room when meal service is known to vary across meals and days of the week? In fact, one or more of the other assessments that were included for construct validity required assessments across multiple meals when residents/staff were present. Thus, it seems odd to compare this type of assessment with the DEAP if it was only conducted once in the absence of residents/staff.

Response: see response above. DEAP is meant to only assess the static physical components of the dining space.

(c) Why isn't there a component within the tool to capture how conducive the environment is to providing residents with assistance to eat? For example, whether staff is seated at the table with residents during the meal; whether staff leave the dining room to retrieve substitutions or drink refills, whether staff have sufficient space in the dining room / tables to provide assistance to all residents in need or if some residents still have to dine in their rooms due to limited space, etc…
Response: Please note the Mealtime Scan includes components on how eating assistance is provided to residents in the dining room.

(d) Inter-rater reliability for each of the two DEAP scales and the total score across the 4 trained observers should be reported in the Measures section.

Response: Inter-rater reliability of DEAP is provided. Reliability of trained observers in M3 was not completed due to limited feasibility and is noted as a limitation.

(e) Measures, DEAP Tool, last sentence, check wording: "For analysis only, researchers derived a total score by tallying individual variables/characteristics using the above item coding [for], resulting…"

Response: grammar has been corrected

(f) Operational definitions need to be provided for each item and/or an appendix of DEAP tool with specific scoring instructions for each item. Right now, it is unclear to the reader how items are actually evaluated and/or scored. For example,

- "percent of residents with a clear view of the garden" - Could it be any type of view outside or did it have to be a garden area? Were residents directly asked during a mealtime period or did the observer assume that if s/he could see the garden from each table, all of the residents could too?

Response: Assessors are trained to walk around the dining room observing from various vantage points the potential for seeing a garden or green space. This detail has been provided in the text.

- "Responding to resident opinion on light, noise and temperature": how was this determined? Again, were residents asked if staff were responsive or did the observer simply document whether residents complained about any of these features during mealtime and then monitor staff response?

Response: Assessors were trained to ask this of staff. This is noted in the text.

- 'Pathway length': between tables? From entryway to exit? From resident rooms to dining room? Was this measured objectively or estimated by the observer?

Response: Details on pathway length for meal delivery are provided.

- How does physical environment 'support supervision'? Presumably, just having residents eat in the dining room rather than their rooms allows for ease of staff supervision. How is this different from dining room size as it seems a larger dining room might be more challenging to supervise relative to a smaller area.

Response: The item stems are provided in the text to support understanding of this concept.
- Were observations conducted between meals to determine if the dining room was accessible or were staff simply asked if residents could access it?

Response: Availability of the space between meals was noted as an unlocked door to the area. This is noted in the text.

Theoretical Constructs for Comparison, Lines 184-185, check sentence wording: "...[was] assessed staff's perceptions with respect to..." Line 188: "...it was completed [by] 10-20 staff..."

Response: Grammatical changes made.

MTS measure: "Scans were completed 4-6 times in each unit's dining room (n=82) with observations at breakfast, lunch and dinner; the mean of scales was used in analyses." What is meant by "scans"? Does this mean that the observer conducted a brief time-sampled observation across 4 to 6 mealtime periods or 4-6 times per meal for each of three meals? What was the approximate length of time and/or was the length of time standardized across observers and meals?

Response: It is now clarified that the Mealtime Scan is a standardized instrument much like the DEAP that rates the mealtime environment when a meal is being conducted. Details on completion are provided.

Food intake data collection across three days: Clarify whether all three scheduled meals were included per day (for a total of 9 meals per resident). Were the 3 days within the same week or month or across what timeframe? Was intake between meals also monitored?

Response: Further details on food intake assessment are provided to address these questions.

Check sentence wording: "...average energy and protein intake was estimated [intake]..."

Response: Wording has been checked for this sentence.

Results:

Report numbers for each type of staff participant (e.g., proportion licensed nurses, nurse aides, dietary, etc...)

Response: Type of staff during a meal was not ascertained. This is noted as a limitation of the data collection.

Add a table summarizing the demographic and functional characteristics of the 639 resident participants. Please also add ethnicity, length of stay, and history of weight loss and/or need for staff assistance with eating for participants. It seems that these measures were collected as part
of the larger study. Also report the proportion who endorsed symptoms of depression via the DRS.

Response: Relevant resident characteristics are now provided in Table 1. Not all variables suggested by the reviewer were collected (e.g. ethnicity).

Home characteristics: Please report bed size, occupancy rate at the time of the study, staffing level, and total number of units and/or dining rooms per site as well as the other "special characteristics" noted in the sampling procedures. Again, it seems that more facility characteristics were collected as part of the larger study for the 32 sites.

Response: Relevant home characteristics where data were available are now provided in Table 1. Some data requested by reviewer (e.g. occupancy rate) were unknown or not collected.

Table 1 correct formatting (n)

Response: Formatting has been fixed.

Homeliness sub-scale: 'short distance from most rooms' and 'dining room visually accessible from most rooms' - weren't these two variables inter-correlated and why were neither in the final model?

Response: Explanation for lack of inclusion of these variables is noted in the Statistical Analysis section.

Functionality sub-scale: why were 'dining room visually accessible from most rooms' and 'number of exits' not in final model?

Response: Explanation is provided in the Statistical Analysis section.

Reviewer 2 Comments:

Page 3, Line 72: DEAP - explain who and when it has been developed. Add References of DEAP original developments.

Response: a brief description of the development of DEAP and its original references are provided (ref 12 and 13).


Response: A brief description on the purpose of the M3 study is provided.

Page 7, Line 175; training of DEAP Staff - 3-day in-person training. Is this really necessary? It was also mentioned in Page 18. Explain why it is important and what are trained? (3 days!)
Response: Training over three days was for all M3 measures. This is not clarified and training specific to DEAP is provided.

Page 8, Line 183-184; Explain the sentence. What is unit level?
Response: This has been clarified at the dining room level, specifically for the Mealtime Scan.

Page 9, Line 223; food intake were estimated from weighing food intake? Not clear.
Response: This section has been clarified

Page 16, Line 381; replace "caloric" to "energy"
Response: change made