

RELIABILITY TESTING OF THE TEAM MEMBER MEALTIME EXPERIENCE QUESTIONNAIRE

H.H. KELLER, V. VUCEA, J. MORRISON-KOECHL

Schlegel-University of Waterloo Research Institute for Aging, University of Waterloo, Waterloo, Canada. Corresponding author: Heather H Keller, Schlegel-University of Waterloo Research Institute for Aging, University of Waterloo, Waterloo ON, N2L 3G1, Canada, hkeller@uwaterloo.ca

Abstract: Team members influence the mealtime experience of residents. Their perspectives on their ability to provide resident- and relationship-centred care during mealtimes is limited. The aim of this study was to describe the development and determine the factor structure and internal and test-retest reliability of the Team member Mealtime Experience Questionnaire (TMEQ). A 23-item questionnaire was developed through several steps. A Likert scale of strongly disagree (score= 1) to strongly agree (score= 5) was used. A total of 137 team members from five diverse homes participated. Time and task-focused items had lower scores (indicating more negative perceptions), whereas knowledge and capability of how to provide resident- and relationship-centred mealtime care had higher scores. Exploratory factor analysis identified three factors; four items were eliminated based on this analysis. Test-retest reliability was completed with 103 participants. Intraclass correlation (ICC) for the total score and three subscales ranged from 0.72 -0.85 while Chronbach's alpha ranged from 0.81-0.92. The 19-item TMEQ is considered reliable for use in research and practice.

Key words: Mealtimes, residential care, staff, reliability.

Introduction

Mealtimes in residential settings (e.g. retirement, assisted living, care homes and long-term care or nursing homes) are an important component of life in the home, providing an opportunity for social connection and relationship building among residents and staff or team members (1). Mealtimes are also vital to the quality of life of residents (2) and can be the 'highlight of the day'. Yet, meals often disappoint and are commonly task-focused interactions (1-3).

Residential care is moving towards resident-centred, relationship-centred care and relational care to improve wellbeing for residents (4-6). These models and approaches are also being applied to mealtimes. Meal experiences that are perceived or described to be more homelike, functional and resident- and relationship-centered have the capacity for improving food intake and nutritional status, as well as satisfaction and quality of life among older adults living in these care environments (2,7-9).

Resident mealtime experience questionnaires (10-12) and mealtime observational tools (13) have been created to help assess mealtimes in residential care. These tools have been influential in documenting the current status of mealtimes and specifically, relationship-centred care during meal service, including aspects that are going well or need to be improved. However, none specifically assess team member perceptions of the mealtime. With the culture change movement in long-term care (14) and increasing awareness of providing resident- and relationship-centred care, there is a need to specifically assess these components from diverse perspectives, including team members. Generic instruments on job satisfaction for team members in long-term care exist (e.g., 15) but do not tap into the mealtime specifically. Relational care can be assessed

in dyadic (team member-resident) interactions (16), but lack specificity to mealtime. As team members are essential to a quality dining experience, their views on their capacity and conduct of relationship-centred care, as well as team work to achieve this approach, is needed. The purpose of this study was to test the reliability of a new Team member Mealtime Experience Questionnaire (TMEQ) designed for residential care.

Methods

The TMEQ was developed iteratively and involved researchers and residential care staff members and home management. The theoretical basis for the TMEQ was based on a conceptual model developed by Watkins et al., (2017) for mealtime interventions (17) and prior work conducted as part of the Making the Most of Mealtimes research program.

Watkins et al. (2017) conducted thematic analysis of 15 studies that qualitatively investigated attitudes, perceptions and mealtime experiences of team members and residents (17). The conceptual model that resulted outlined how care provision (e.g. model of care, staff approach), could directly and indirectly influence resident agency (e.g. choice of when, where and what eat), mealtime culture (e.g. values and traditions) and meal quality and enjoyment. Although undertaken to identify potential points of intervention, themes from this analysis identified concepts that would be relevant to a team member instrument assessing relationship-centred care at mealtimes. Themes included: time demands; challenges in providing mealtime assistance; the importance of resident choice; staff capacity to meet this choice given health concerns and organizational limits (e.g. seating arrangements); and importance of the meal to social interaction and quality of life.

RELIABILITY TESTING OF THE TEAM MEMBER MEALTIME EXPERIENCE QUESTIONNAIRE

The Making the Most of Mealtimes research program involved a variety of studies that have assessed the mealtime experience. For example, participant observation studies highlighted the varied activities that team members and residents were involved in during mealtimes (18) demonstrating the importance of teamwork to achieve the tasks required. A narrative review of the literature identified social interaction, choice and showing of respect as important concepts in resident-centered mealtime care (19). A case study similarly identified best practices for relationship-centered dining (7) and this concept was defined and elaborated into the objective Mealtime Scan+ used to assess and describe mealtimes on their physical, social and person and relationship-centred environments (13). During the developmental evaluation of a team-focused intervention to improve mealtimes, qualitative interviews with team members clarified key barriers and enablers to making improvements in the mealtime experience (20). Themes exemplified what was important to team members at mealtimes. Finally, small group discussions with team members (n= 7) at a single long-term care home in Ontario helped to identify key concepts that could be covered in a questionnaire; these informants were excluded from subsequent development and testing steps. Concepts identified included: sufficient time and teamwork, as well as feeling empowered to provide choice and meet resident needs during the meal.

Initial items were created based on this knowledge and Likert-style responses (i.e., strongly agree to strongly disagree) were used. Several drafts of the questionnaire were created and reviewed by a larger research team involved in other food/mealtime research in long term care. When a near-final draft was established, this was provided in draft form to six management-level contacts at five diverse homes (two non-profit long-term care; one corporate, for-profit long-term care; one independent, retirement and long-term care; and one faith-based, retirement and long-term care). These contacts had been involved in prior research with the authors and were interested in making improvements in their mealtime practices. They were asked to review the questionnaire for: a) clarity of instructions, b) relevance of the response options, c) relevance of the question items to teamwork and relationship-centred care, d) item wording to ensure it was clear and well understood, and e) recommendations on additional concepts or questions they thought were relevant to include. The lead researcher met with these contacts to discuss the questionnaire and identify opportunities for making improvements. Revisions were made based on this feedback. All managers indicated they would like to have their home be involved in the test-retest reliability of the tool; they themselves were excluded from completion of the tool to minimize bias. The TMEQ was finalized at 23 items with strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5) response options.

An information letter and poster were sent to the management of the five participating homes to inform team

members about the opportunity to participate in the study. On designated dates, a researcher visited the home to recruit interested team member participants. A space was set aside for the study and team members to complete the questionnaire before or after their shift or during their breaks. The inclusion criteria were that the employee had some role in mealtimes for residents and could read and communicate in English. Eligible team members were approximately 250-300 employees based on the staffing models for long-term care homes in Ontario. After providing a written information letter, explaining the purpose and procedures, written consent was obtained. The participants were asked to complete a short demographic and role questionnaire (i.e., age, gender, time working in current home, position, and roles during mealtime). They then completed the TMEQ. Participants were asked to identify their work shifts for approximately two weeks later to promote completion of the second TMEQ. As a token of appreciation for their time, participants received a small gift card for a local coffee shop. All homes received a summary report providing their results in comparison to the overall study results. Sample size estimation based on intraclass correlation (ICC) is challenging, as it is not only dependent on the number of raters (i.e., participants), but also the variability of their responses, which is not known for a new measure such as the TMEQ. However, sample size can be estimated based on desired narrowness of the ICC confidence interval (21). Using provided tables (21), and estimating an ICC of 0.80 based on two administrations, and a 95% CI lower limit of 0.70 or 0.65, 90% assurance of such a confidence interval would be achieved with a sample between 83 and 162. Although this sample size calculation method is intended for a one-way random effects model, it provides a conservative estimate for two-way models and so is appropriate for use in this case (21). A target sample size of 150 was set, with recognition that some participants (~25) would not complete the second administration of the TMEQ. This study was provided ethics clearance by a research ethics board at the University of Waterloo.

Statistical Analyses

Participant characteristics were summarized as proportions; averages and ranges were used where appropriate. The mean and standard deviation (SD) and median, range, and interquartile range were determined for each item score based on the first administration of the questionnaire for descriptive purposes (n=137). Internal consistency of the first administration of the TMEQ was assessed with Cronbach's alpha with item deletion, item-total correlation, and exploratory factor analysis (22). The exploratory factor method used was iterated principal axis analysis with oblique varimax (obvarimax) rotation, which is appropriate when the factors are expected to be correlated (23). This analysis identified latent factors within the questionnaire. Standardized regression coefficients of <0.30 were considered to have minimal significance to a factor, 0.40 were considered important and

≥0.50 were considered to have practical significance (24). Items with loadings <0.40 and those that had cross-loadings (i.e. more than one factor) of ≥0.45 were removed (25).

After removal of items based on the factor analysis, Cronbach’s alpha was calculated again to test internal consistency within the factors and the updated 19-item questionnaire. The test-retest reliability of the TMEQ was assessed based on those individuals who completed a second administration of the questionnaire approximately two weeks later (n=103). The ICC for the overall score and the subscales determined by the factor analysis were calculated using two-way mixed effects models testing for absolute agreement, which is appropriate to account for multiple raters (i.e., participants; 26) with the intended application of the TMEQ as a single measurement (14). ICC values between 0.75 and 0.90 indicate good reliability and >0.90 excellent reliability (26). All analyses were performed using SAS® Studio software (release: 3.6, 2012-2017, SAS Institute Inc., Cary, NC).

Results

Across the five participating homes, 137 team members completed the first administration of the TMEQ; 103 (75%) completed both administrations. The 23 items required approximately five minutes to complete, although some participants where English was a second language, took longer to complete the tool. No statistically significant differences in participants were noted for those who did or did not complete the second administration of the TMEQ. Participants were mostly female (90%), had a mean age of 44 (SD 11) years, and had worked in the home for about 10 (SD 8) years (Table 1). Participants were involved in a variety of mealtime roles with the most common being serving and assisting residents to eat.

TMEQ item mean scores ranged from a low of 3.15 (SD 1.18) to a high of 4.3 (SD 0.62) (Table 2). All but one item had a median score of 4; question #21 (I feel rushed/overwhelmed during mealtimes), which was reverse coded for the analysis had a median score of 3 when reversed. Lowest ranked items were: being rushed/overwhelmed at mealtimes; having enough time to properly assist residents; and, enough time to complete all tasks carefully. Highest ranked items included: making mealtimes enjoyable for residents; getting support from other team members; knowing how to assist residents so that they could be as independent as possible; and offering food choices to residents at mealtimes.

The TMEQ demonstrated good internal consistency with a standardized Cronbach’s alpha of 0.93, which did not change when any of the items were deleted. Individually, the items generally performed well with item-total correlations ranging from 0.40 to 0.74, and the majority between 0.60 and 0.70 (Table 2). The exploratory factor analysis yielded three factors with Eigenvalues >1.0. Four items were removed from subsequent analysis; items #1, 9, and 10 did not load onto any factors (<0.40) and item #20 was cross-loaded on Factors 1 and

2 (Table 3). The three latent constructs within the TMEQ were labeled: time, supportive atmosphere, and relational care.

Table 1
Demographics for Team member Mealtime Experience Questionnaire test-retest reliability participants

Staff role ^a	Test	Retest
	Proportion (%) n= 137	Proportion (%) n= 103
Health care aid / personal support worker	47	44
Registered practical / licensed nurse	12	13
Registered nurse	7	7
Dietary aid	11	13
Recreation assistant / therapist	8	8
Other (e.g. volunteer, restorative care, manager)	18	15
Highest level of education ^a		
High school	11	13
Post-high school certificate	9	7
College diploma	53	52
Some university degree	9	9
University degree	18	18
Other	4	1
Gender ^b		
Female	90	90
Mealtime roles in the dining room ^c		
Plating	31	27
Serving	68	66
Assisting	77	74
Staff mealtime volunteer	7	7
Other ^c	18	20
	Average (range)	Average (range)
Age (years) ^d	44 (21-66)	44 (21-62)
Length of time working (years)	10 (<1-33)	10 (<1-33)

a. Total percentage is > 100% due to reporting of multiple responses; b. Gender based on n= 136 and n= 102, respectively; c. Other mealtime roles included: administration of medication, auditing food intake, supervising, training volunteers, and cleaning; d. Mean age based on n=132 and n= 98, respectively.

Internal consistency was maintained in the 19-item version of the instrument, with an overall Cronbach’s alpha of 0.92, and the subscales ranging from 0.81 to 0.86. The total score ICC was 0.85, signifying that the instrument had good test-retest reliability. Each of the subscales demonstrated acceptable test-retest reliability, with the “supportive environment” subscale having the lowest ICC of 0.72. Based on the few respondent comments and questions on clarification of items, there were no adaptations required to make items clearer for this target audience.

RELIABILITY TESTING OF THE TEAM MEMBER MEALTIME EXPERIENCE QUESTIONNAIRE

Table 2

Description of Team member Mealtime Experience Questionnaire responses and item-total correlations (n= 137)

Questions	Mean (SD)	Median (IQR)	Item-Total Correlation (standardized)
<i>Please rate your agreement with the following statements</i>			
<i>Strongly Disagree (1); Disagree (2); Neutral/No Opinion (3); Agree (4); Strongly Agree(5)</i>			
1. I am able to make mealtimes enjoyable for residents.	4.20 (0.62)	4 (4, 5)	0.57
2. I have enough time to perform mealtime tasks carefully.	3.56 (1.06)	4 (3, 4)	0.60
3. I get support from other team members during mealtimes.	4.17 (0.68)	4 (4, 5)	0.57
4. I have time to talk with residents at mealtimes.	3.78 (1.01)	4 (4, 4)	0.58
5. Mealtimes give me an opportunity to get to know residents better.	3.95 (1.00)	4 (4, 5)	0.62
6. I feel comfortable talking socially with residents during mealtimes.	4.07 (0.82)	4 (4, 5)	0.46
7. I am able to perform all of my mealtime tasks.	3.85 (0.89)	4 (4, 4)	0.67
8. I am able to support residents to eat when they want.	3.62 (1.12)	4 (3, 4)	0.68
9. I almost always meet the food preferences of residents.	3.77 (0.95)	4 (3, 4)	0.64
10. Mealtimes are one of the best parts of my work day.	3.45 (1.06)	4 (3, 4)	0.58
11. When there is a challenge during mealtimes our team comes together to solve it.	4.04 (0.89)	4 (4, 5)	0.60
12. I have enough time to provide assistance to residents who need help with eating	3.28 (1.22)	4 (2, 4)	0.66
13. I know how to assist residents so that they can be as independent as possible at mealtimes.	4.15 (0.67)	4 (4, 5)	0.50
14. The dining room is comfortable and welcoming.	3.91 (0.93)	4 (4, 5)	0.66
15. It is easy for me to move around in the dining room.	3.86 (0.95)	4 (4, 4)	0.60
16. I am able to encourage residents to talk with each other at meals.	3.80 (0.80)	4 (3, 4)	0.58
17. I can support residents to eat their meal where they want (e.g. smaller area).	3.66 (0.93)	4 (3, 4)	0.55
18. I make sure that residents feel respected at mealtimes.	4.30 (0.62)	4 (4, 5)	0.60
19. I can find respectful ways to reduce challenging behaviours at mealtimes.	4.01 (0.74)	4 (4, 4)	0.56
20. I am satisfied with the mealtime experience in this home/ neighbourhood/ unit.	3.80 (0.99)	4 (3, 4)	0.74
21. I feel rushed/overwhelmed during mealtimes.*	3.15 (1.18)	3 (2, 4)	0.40
22. I offer residents food choices during meals.	4.16 (0.86)	4 (4, 5)	0.50
23. Management responds to my concerns about mealtimes.	3.75 (1.00)	4 (3, 4)	0.63

Note: This table only included results for participants who completed the first administration of the questionnaire. Average scores for the first time point are presented. *Reverse coded (original value 2.85); Abbreviations: IQR=interquartile range (lowest, highest quartile); SD=standard deviation

Discussion

Measuring mealtime experience from diverse perspectives will help to make improvements to this important aspect of care in residential settings. The TMEQ can be used not only to identify where practice change is needed during a baseline assessment, but also engage team members in the improvement process by giving them a 'voice'. TMEQ was found to be a reliable instrument for use in practice and research. Culture change, a philosophy of care that is becoming preferred practice in long-term care homes in North America, advocates for the empowerment of team members to provide resident-centered care (14). The TMEQ could also promote 'information exchange' among responsive leaders and staff who provide direct care (27). The test-retest reliability demonstrated in this study for the TMEQ indicates that it is useful for further research and practice to measure team member perspectives on

their experiences during mealtimes and providing relationship-centred care.

Prior research suggests that task-focused approaches predominate in residential dining rooms (1,2) Thus, it was not surprising that ratings around the time and efficiency of mealtimes were rated lower (e.g., items 2, 4, 8, 12, 21) than other items. Time limits for meals potentially resulted in the low score for mealtimes being one of the best parts of the day for team members, as well as lower scores for having the time to assist residents and talking with residents. Home/neighbourhood routines, menu capacity and home policies, may influence the team member views on providing resident- and relationship-centred care, as noted from the lower scores on providing food preferences and being flexible with when and where residents want to eat (3.62 and 3.66 respectively). Policy and regulations have been described previously as barriers to culture change (14). Although team members felt that they

Table 3
Exploratory factor analysis of Team member Mealtime Experience Questionnaire

	Factor 1 - Time	Factor 2 – Supportive atmosphere	Factor 3 – Relational care
1. I am able to make mealtimes enjoyable for residents.	0.271	0.196	0.280
2. I have enough time to perform mealtime tasks carefully.	0.678	0.065	0.069
3. I get support from other team members during mealtimes.	0.088	0.530	0.132
4. I have time to talk with residents at mealtimes.	0.381	-0.198	0.600
5. Mealtimes give me an opportunity to get to know residents better.	0.169	0.005	0.660
6. I feel comfortable talking socially with residents during mealtimes.	0.012	-0.069	0.674
7. I am able to perform all of my mealtime tasks.	0.549	0.166	0.184
8. I am able to support residents to eat when they want.	0.636	0.275	0.000
9. I almost always meet the food preferences of residents.	0.283	0.348	0.213
10. Mealtimes are one of the best parts of my work day.	0.188	0.384	0.190
11. When there is a challenge during mealtimes our team comes together to solve it.	0.062	0.641	0.090
12. I have enough time to provide assistance to residents who need help with eating	0.682	-0.057	0.263
13. I know how to assist residents so that they can be as independent as possible at mealtimes.	-0.124	0.306	0.492
14. The dining room is comfortable and welcoming.	0.243	0.699	-0.047
15. It is easy for me to move around in the dining room.	0.111	0.507	0.179
16. I am able to encourage residents to talk with each other at meals.	0.137	0.126	0.503
17. I can support residents to eat their meal where they want (e.g. smaller area).	0.449	0.136	0.150
18. I make sure that residents feel respected at mealtimes.	-0.056	0.555	0.307
19. I can find respectful ways to reduce challenging behaviours at mealtimes.	-0.139	0.373	0.514
20. I am satisfied with the mealtime experience in this home/ neighbourhood/ unit.	0.669	0.461	-0.131
21. I feel rushed/overwhelmed during mealtimes.*	0.592	-0.152	0.112
22. I offer residents food choices during meals.	-0.018	0.543	0.140
23. Management responds to my concerns about mealtimes.	0.389	0.431	0.022

Note: significant factor loadings are bolded. Items that are italicized do not load onto any factors significantly (#1, 9, 10 and 20) or have a cross-loading ≥ 0.45 (#20) and have been removed from the final version of the questionnaire.

had capacity for making mealtimes enjoyable (4.20), that they worked as a team (4.17), knew how to assist residents to be independent (4.15), and they could talk socially with residents (4.07), their belief that management heard their concerns was rated lower (3.75). Culture change, which promotes resident-centered and relationship-focused care, necessitates a flattening of hierarchical structures and empowering teams to provide individualized care to residents (14). These results from five Ontario homes suggest we have some way to go before we realize the potential of mealtimes to be relational in long-term care (7).

Now that the TMEQ has demonstrated reliability, it can be used in a variety of ways. As a research tool, it could be used to evaluate dining room and mealtime interventions. It could also be used by residential care homes to identify areas for improvement or where staff restructuring is needed; for example, in a neighbourhood where team members are unduly rushed, changing staffing levels or routines could be a solution. The TMEQ could also be used across neighbourhoods in a home or across homes in a corporation to determine if

home-wide training or policy change is warranted. Teams that indicate mealtimes are going well can be identified to spread their better mealtime practices to their colleagues in other areas of a home.

There are some limitations to this work that should be noted. We did not reach the anticipated sample size of 150; regardless, reliability was demonstrated, and 95% confidence intervals were relatively narrow (21). Only five care homes in one region of Ontario were included to promote study feasibility. Future work should also determine responsiveness to change as well as construct validity when compared to other measures of mealtime experience, such as with the Mealtime Time Scan+ (13) or resident/family measures of dining quality (10,12).

Although qualitative research has highlighted team member perspectives on mealtimes in long-term care (17), before this study, there was no standardized questionnaire that could be used to measure these perspectives. Despite the importance placed on the quality of the dining experience to resident quality of life (1,17), this is the first known tool that measures the perceptions of team members involved in mealtime

RELIABILITY TESTING OF THE TEAM MEMBER MEALTIME EXPERIENCE QUESTIONNAIRE

Table 4

Internal consistency and test-retest reliability of final Team member Mealtime Experience Questionnaire with 19 items

Total scale/subscale	Mean (SD)	Standardized Cronbach's alpha	ICC*
Total scale (max. 95)	72.8 (11.0)	0.92	0.85
Time (max. 30)	20.8 (4.8)	0.85	0.81
Supportive atmosphere (max. 35)	28.2 (4.4)	0.86	0.72
Relational care (max. 30)	23.8 (3.7)	0.81	0.78

*ICC calculations based on 103 participants who completed two administrations of the questionnaire.

activities. The current study describes the development of TMEQ and demonstrates that it has good test-retest reliability, which is necessary for any instrument to be considered acceptable for research and practice (26).

Conflict of interests: All authors declared no conflicts of interest.

Ethical Standards: This study was reviewed and received ethics from a University of Waterloo Research Ethics Board. All participants provided written informed consent.

References

- Lowndes R, Daly T, Armstrong P. "Leisurely Dining": Exploring how work organization, informal care, and dining spaces shape residents' experiences of eating in long-term residential care. *QHR*. 2017;28:126-144. doi: 10.1177/1049732317737979
- Henkusens C, Keller HH, Depuis S, Schindel Martin L. Transitions to long-term care: how do families living with dementia experience mealtimes after relocating? *J Appl Gerontol*. 2014;33:541-563. doi: 10.1177/0733464813515091
- Chaudhury H, Hung L, Rust T, Wu S. Do physical environmental changes make a difference? Supporting person-centred care at mealtimes in nursing homes. *Dementia*. 2017;16:878-896. doi: 10.1177/1471301215622839
- Kitwood T. *Dementia reconsidered: The person comes first*. Open University Press; Philadelphia, 1997.
- Nolan MR, Davies S, Brown J, Keady J, Nolan J. Beyond "person-centred" care: a new vision for gerontological nursing. *Int J Older People Nurs*. 2004;13:45-53. doi: 10.1111/j.1365-2702.2004.00926.x
- Rockwell J. From person-centered to relational care: Expanding the focus in residential care facilities from person-centered to relational care. *J Gerontol Soc Work*. 2012;55:233-248. doi: 10.1080/01634372.2011.639438
- Ducak K, Keller H, Sweatman G. Dining culture change in long-term care homes: transitioning to resident-centered and relational meals. *Ann Long Term Care*. 2015;June: 28-36.
- Roberts E. Six for lunch: A dining option for residents with dementia in a special care unit. *J Housing Elder*. 2011;25:352-79. doi: 10.1080/02763893.2011.621862
- Paquet C, St-Arnaud-McKenzie D, Ma Z, Kergoat MJ, Ferland G, Dubé L. More than just not being alone: the number, nature, and complementarity of meal-time social interactions influence food intake in hospitalized elderly patients. *Gerontol*. 2008;48:603-611. doi: 10.1093/geront/48.5.603
- Croghan NL, Evans B, Velasquez D. Measuring nursing home resident satisfaction with food and food service: initial testing of the FoodEx-LTC. *J Gerontol*. 2004;59:370-377. doi: 10.1093/gerona/59.4.m370
- Grunert KG, Dean M, Raats MM, Nielson NA, Lumbers M, Food in Later Life Team. A measure of satisfaction with food-related life. *Appetite*. 2007;49:486-493. doi: 10.1016/j.appet.2007.03.010
- Keheyayan V, Hirdes JP, Tyas SL, Stolee P. Residents' self-reported quality of life in long-term care facilities in Canada. *Can J Aging* 2015;34:149-164. doi: 10.1017/S0714980814000579
- Keller HH, Awwad S, Morrison J, Chaudhury H. Inter-rater reliability of the Mealtime Scan+. *J Nutr Health Aging*. 2019;23:623-627. <https://doi.org/10.1007/s12603-019-1210-1>
- Miller SC, Miller EA, Jung HY, Sterns S, Clark M, Mor V. Nursing home organizational change: the "Culture Change" movement as viewed by long-term care specialists. *Med Care*. 2010;48:65S-81S. doi: 10.1177/1077558710366862
- Chou SC, Boldy DP, Lee AH (2002) Measuring job satisfaction in residential aged care. *Int J Qual Health Care*. 2002;1491:49-54. doi: 10.1093/intqhc/14.1.49
- McGilton K, Pringle D, O'Brien-Pallas Lm Wynn F, Streiner D. Development and psychometric testing of the Relational Care Scale. *J Nurs Meas*. 2005;13:51-64. doi: 10.1891/jnum.2005.13.1.51
- Watkins R, Goodwin VA, Abbott RA, Backhouse A, Moore D, Tarrant M. Attitudes, perceptions and experiences of mealtimes among residents and staff in care homes for older adults: A systematic review of the qualitative literature. *Geriatr Nurs* 2017;38:325-333. doi: 10.1016/j.gerinurse.2016.12.002
- Curle L, Keller HH. Resident interactions at mealtime: an exploratory study. *Eur J Aging*. 2010;7:189-200. doi: 10.1007/s10433-010-0156-2
- Reimer HD, Keller HH. Mealtimes in nursing homes: striving for person-centered care. *J Nutr Elder*. 2009;28:327-347. doi 10.1080/01639360903417066
- Wu S, Morrison J, Dunn H, Vuca V, Iuglio S, Keller HH. Developmental evaluation of the CHOICE Program: A relationship-centred mealtime intervention for long-term care. *BMC Geriatrics*. 2018;18:277. <https://doi.org/10.1186/s12877-018-0964-3>
- Zou GY. Sample size formulas for estimating intraclass correlation coefficients with precision and assurance. *Stat Med*. 2012;31:3972-81. doi: <https://doi.org/10.1002/sim.5466>
- Tabachnick BG, Fidell LS. *Using Multivariate Statistics*. Pearson Education Inc; Boston, 2007.
- DeCoster Overview of Factor Analysis. 1998. Retrieved Sept 19, 2019 from <http://www.stat-help.com/notes.html>
- Hair J, Anderson RE, Tatham RL, Black WC. *Multivariate data analysis*. 4th ed. Prentice-Hall Inc; New Jersey, 1995.
- Wang J, Li C, Zou S, Chen H, Xiang J, Hu J, Huang H, Tan Y. Psychometric evaluation of undergraduate student nurses' learning perceived needs in disaster nursing: Two cross-sectional studies. *Nurse Educ Today*. 2020;84. <https://doi.org/10.1016/j.nedt.2019.104208>
- Koo TK, Li MY. A guideline of selecting and reporting intraclass correlation coefficients for reliability research. *J Chiropr Med*. 2016;15:155-163. doi: 10.1016/j.jcm.2016.02.012
- Caspar S, Le A, McGilton KS. The Responsive Leadership Intervention: Improving leadership and individualized care in long-term care. *Geriatr Nurs*. 2017;38:559-566. doi: 10.1016/j.gerinurse.2017.04.004