The relationship between clinical outcomes and quality of life for residents of aged care facilities

AUTHORS

Professor Mary Courtney
PhD, RN
Acting Executive Dean, Faculty of Health, Queensland University of Technology, Australia.

Maria O'Reilly
MOccThy
PhD Candidate/ Senior Research Assistant, Institute of Health and Biomedical Innovation (IHBI), Queensland University of Technology, Australia.
m2.oreilly@qut.edu.au

Professor Helen Edwards
PhD, RN
Head, School of Nursing, Queensland University of Technology, Australia.

Stacey Hassall
MOrgPsych
Formerly of Blue Care, Brisbane, Queensland, Australia.

Acknowledgements

This project was made possible through funding from Blue Care (Brisbane) and the Queensland University of Technology, Strategic Linkages Scheme.

KEY WORDS

quality of care, aged care, residential facilities, quality assessment, quality of life

ABSTRACT

Objectives

It is widely assumed improving care in residential facilities will improve quality of life (QoL), but little research has explored this relationship. The Clinical Care Indicators (CCI) Tool was developed to fill an existing gap in quality assessment within Australian residential aged care facilities and it was used to explore potential links between clinical outcomes and QoL.

Design and Setting

Clinical outcome and QoL data were collected within four residential facilities from the same aged care provider.

Subjects

Subjects were 82 residents of four facilities.

Outcome Measures

Clinical outcomes were measured using the CCI Tool and QoL data was obtained using the Australian WHOQOL-100.

Results

Independent t-test analyses were calculated to compare individual CCIs with each domain of the WHOQOL-100, while Pearson's product moment coefficients (r) were calculated between the total number of problem indicators and QoL scores. Significant results suggested poorer clinical outcomes adversely affected QoL. Social and spiritual QoL were particularly affected by clinical outcomes and poorer status in hydration, falls and depression were most strongly associated with lower QoL scores. Poorer clinical status as a whole was also significantly correlated with poorer QoL.

Conclusions

Hydration, falls and depression were most often associated with poorer resident QoL and as such appear to be key areas for clinical management in residential aged care. However, poor clinical outcomes overall also adversely affected QoL, which suggests maintaining optimum clinical status through high quality nursing care, would not only be important for resident health but also for enhancing general life quality.

INTRODUCTION

Monitoring quality of care is of increasing interest within aged care facilities. However, Australia does not yet have a comprehensive system of assessment that can monitor the quality of clinical outcomes in residential aged care settings (O'Reilly et al 2007). The Minimum Data Set (MDS) is a comprehensive system of assessment employed within nursing homes in the United States of America. Information is collected on a number of clinical areas and then collated into meaningful data for interpretation (Mor et al 2003). Integral to this process is the use of Quality Indicators (Mor et al 2003; Zimmerman et al 1995). However, while an excellent system, it is based on American data and linked to USA administrative processes. Therefore, simple adoption of the instrument in Australian facilities would not necessarily be prudent or appropriate.

Quality of care is difficult to define and measure (Mor 2005; Mor et al 2003; Marquis 2002; Donabedian 1992; Doyle and Carter 1992) but one approach to measurement is through use of quality indicators. These are not direct or definitive measures of quality; rather, they *indicate* areas of care requiring greater scrutiny (Courtney and Spencer 2000; Karon and Zimmerman 1998, 1996; Zimmerman et al 1995). Donabedian (1992) suggested quality evaluation can occur in the areas of structure, process or outcome, with outcomes representing the result of all inputs into care. Knowledge of a strong causal relationship between existing structures and processes and the final outcome enables confidence in assuming the care provided was largely responsible for the outcome achieved (Weissman et al 1999; Donabedian 1992, 1988, 1987).

It is widely assumed improving care will improve quality of life (QoL) but little research has investigated this link. Thus, there is a need not only to identify effective methods of assessing and enhancing quality of care but also to identify its effect on QoL and more specifically, which areas of care have the most impact (Harrington et al 1999; Bartlett and Burnip 1998).

As with quality of care, it is well established that QoL is an imprecise concept that has different meanings for different people (Hambleton et al 2009; Bowling 2007; Walker and Mollenkopf 2007; McDowell 2006). When reviewing QoL in older people, the psychosocial domain becomes particularly important, especially in the context of declining physical health (Hambleton et al 2009; Bowling 2007; Walker and Mollenkopf 2007; Byrne and MacLean 1997). Indeed, it has often been found people with significant health problems or functional impairment rate themselves more highly on QoL scales than expected by researchers or care professionals (Walker and Mollenkopf 2007; Carr and Higginson 2001; Guse and Masesar 1999; Rai et al 1995; Arnold 1991). Carr and Higginson (2001) referred to this as the “disability paradox” (p.1358). Further, living within residential care settings is qualitatively different to living within the general community and because of this there are a number of factors that are uniquely important to residents of such facilities (Courtney et al 2003). For example, the lives of aged care facility residents tend to be more regimented than those living in their own homes, thus factors relating to daily routine or control can assume more importance (Bowling 2007; Edwards et al 2003; Kane 2001; Byrne and MacLean 1997). Moreover, residents are frailer than older people in the community and as such clinical status is an issue requiring consideration (Vaarama et al 2007).

The scope of this paper

With the above factors in mind, the authors wished to explore whether clinical outcomes would be related to QoL in residents of aged care facilities. The research described here was part of a larger project, which developed the Clinical Care Indicators (CCI) Tool for use in Australian residential aged care facilities. The CCI Tool was designed to provide an indication of care quality through use of clinical outcome data. Collapsing such data into percentage scores indicating the presence or absence of particular problems allows for comparison between facilities, as well as enabling individual facilities to monitor their own outcomes and to decide on areas of focus for quality improvement. Its development and features are described elsewhere (Courtney et al 2007).

METHOD

Instruments and Administration

Clinical Outcomes

Clinical Care Indicators (CCI) Tool (Courtney et al 2007): As described above, this tool was developed as a means of collecting comprehensive clinical indicator data for use in the residential aged care context. It was developed in consultation with industry representatives, as well as through extensive literature review and a small national trial (Courtney et al 2007). The version used for this paper covered 23 areas of care, as outlined in Table 1. At the time of the research it had not yet undergone validity and reliability testing, but it had proven to be a useful tool, yielding comprehensive clinical data for analysis. Psychometric testing is currently underway and will be reported on in the near future.

Table 1: Care Domains, Clinical Areas and Clinical Care Indicators from the CCI Tool (Version II)

Care Domains	Clinical Area	Clinical Care Indicators (CCIs)
Resident Health	1. Pressure ulcer rates	Presence of Ulcers
	2. Skin integrity	Presence of Lesions
	3. Infections	Presence of Infections
	4. Medication	a. Polypharmacy b. No Pharmacy Review
	5. Pain management	a. Pain frequency: Daily Pain b. Pain severity: Severe pain
	6. Cognitive Status	Decline in Cognitive Function
Personal Care	7. Continence	a. Bladder Continence b. Bowel Continence
	8. Hydration status	Poor Hydration
	9. Activities of daily living	Activities of Daily Living Decline
	10. Dental Health	Poor Dental Health
	11. Care of the senses	a. Sensory Decline b. Sensory Aids
Resident life style	12. Nutrition	Poor nutritional status
	13. Meaningful activity	Meaningful Activity
	14. Sleeping patterns	a. Sleep disturbance b. Use of sedatives
	15. Communicating	a. Communication difficulties b. Communication difficulties without use of communication aids c. Difficulties with English language without access to translators
	16. Adaptation and behaviour patterns	Disruptive Behaviour
Care Environment	17. Restraints	a. Physical Restraints b. Chemical Restraints
	18. Falls	Falls in the last month
	19. Depression	a. Symptoms of depression b. Symptoms of depression without treatment
	20. Family involvement	Family support
	21. Allied health	Allied Health Contact
	22. Doctor visits	Visits by Doctor/ Specialist
	23. Multi-disciplinary Case Conferences	Multi-disciplinary case conferences

Presence of a clinical problem in an individual resident is indicated through a clinical care indicator being triggered. Some of these are simple (eg are pressure ulcers present or not), while others are triggered by a threshold (eg presence of polypharmacy is indicated by a resident taking more than nine medications).

A registered nurse at each study facility was seconded to complete CCI Tools on each consenting resident, with data submitted to the research team in de-identified form. This ensured accuracy of clinical data while maintaining participant confidentiality.

Quality of Life

The Australian WHOQOL-100 (WHOQOL Group 1998; Murphy et al 2000): After reviewing numerous tools, Courtney et al (2003) identified the WHOQOL-100 as one of the most suitable means of assessing QoL for residents of aged care facilities. It is comprehensive and subjective in focus, underwent an extensive development process and has sound psychometric properties (WHOQOL Group 1993, 1994a, 1994b, 1995, 1998). It includes spirituality and the environment, which are not commonly present on other QoL scales but both of importance for residents of aged care facilities (Courtney et al 2003). It presents its results as a profile of six domains (*physical, psychological, independence, social relationships, environment and spiritual*), as well as *overall quality of life and general health* as a separate score (Murphy et al 2000). A limitation of the tool is it cannot be used with people who have moderate-severe cognitive or communication impairments. However, this is common to many QoL questionnaires.

Possible scores for the six domains range from 4 to 20, with higher scores indicative of better QoL; for ease of analysis they can also be converted to a scale ranging from 0 to 100, with scores representing a percentage of the total possible score (Murphy et al 2000). The *overall QoL and general health* score also ranges from 4-20, but it cannot be converted into a '0-100' score.

The project manager and a research assistant, independent to the study facilities, administered the WHOQOL-100 surveys via interview; this enabled residents to discuss potentially sensitive lifestyle information separate to facility staff. Respondents were also given the option of survey self-completion.

PARTICIPANTS

Facilities

Four residential aged care facilities from the same provider participated in the study. All were medium-sized (40-80 beds), with a mix of high care and low care residents. While in previous years, high care residents would have been housed in nursing homes and low care residents housed in hostels, 'Ageing in Place' policies in Australia now results in many facilities containing residents designated both high care and low care. Thus the facilities used in the study were considered reasonably representative.

Residents

The resident sample was one of convenience – whereby we recruited the first available 25 (± 2) willing participants in each facility who had not been excluded due to moderate/severe cognitive or communication impairment. The proportion of residents in each facility who were included in the sample ranged from 26% to 42%. At commencement, 107 residents consented to participate, but while CCI data were collected for all of these, QoL questionnaires could only be completed for 82 residents, due to the reliance on face-to-face contact (some residents were unavailable at the time of interview).

Data Analysis

Frequency distributions of all variables were generated and inspected. A small number of invalid codes were identified and corrected by consulting the original data. The variable distributions were also inspected for extreme values and outliers, but none were detected. In almost all cases, results were normally distributed and parametric statistical techniques (independent samples t-tests, Pearson's r correlations) were used to analyse the data. On two occasions, results were not normally distributed due to small sample sizes, so the non-parametric Mann-Whitney U-test was used as an alternative.

Alpha was set at 0.05, but to compensate for the effects of multiple comparisons and the possibility of Type 1 error, Ottenbacher's percentage error rate (Ottenbacher 1988) was calculated. Out of a total of 206 individual comparisons, 27 significant results were generated; application of Ottenbacher's equation, 100C/M (where C = the total number of comparisons and M = the number of significant results), indicated 38% (or ten) of the significant results would have occurred by chance. Adjusting α to 0.03 eliminated eight results (29.6%), while adjusting α to 0.02 eliminated 14 results (52%); to maintain statistical rigour, the more conservative adjusted α of 0.02 was chosen.

FINDINGS

Resident Characteristics

Table 2 lists the sample characteristics in regards to gender, care level, living space and length of stay. The gender distribution was similar to the national residential care population. Nationally, men constitute 28.8% of aged care facility residents (AIHW 2008), while in this sample, 27.6% of the group were male. However, the proportion of high care residents (36.8%) was markedly lower than the national figure of 70% (AIHW 2008). This is likely because of the need to recruit residents with adequate cognitive and communication abilities, fewer of whom would be categorised as high care. Just over half the sample resided in private spaces (i.e. private room and ensuite or shared with spouse only); this reflects the mix of facilities in the sample, two of which were older buildings, containing more shared facilities. More recent trends in residential care design have tended to favour private rooms and bathrooms. Nearly three-quarters of the residents had resided in their facility for five years or less and at least one in four had resided in their facility for less than a year. The AIHW (2008) found similar figures, with 53% of residents in 2007 having resided in an aged care facility for one to five years and 26% for one year or less.

Table 2: Descriptive Statistics - Resident Gender, Care Level, Living Space and Length of Stay (N=107)

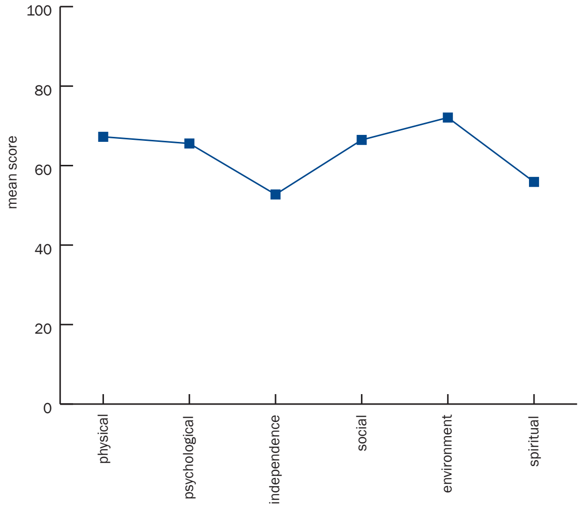
		Count (%)
Gender	Female	76 (72.4%)
	Male	29 (27.6%)
Care Level	High Care	39 (36.8%)
	Low Care	67 (63.2%)
Living Space (N=81, 26 missing)	Private	48 (59.3%)
	Shared	33 (40.7%)
Length of Stay	Under 1 year	27 (25.2%)
	1 – 5 years	60 (56.1%)
	Over 5 years	20 (18.7%)

The sample had a median age of 83 years (range: 66 to 98 years), also similar to the national figures, whereby in 2007 more than half (54%) of the Australian residential aged care population was 85 or older (AIHW 2008).

WHOQOL-100 Domain Scores

Mean domain scores (0-100 scale) are shown in Figure 1. Participants' lowest scores were in the *independence* domain (mean 52.7) and their highest in the *environment* domain (mean 72.1). The profile reflects moderate QoL in each of the domains except for *independence* and *spirituality*, for which slightly lower scores were recorded.

Figure 1: WHOQOL Domain Scores (0-100 Scale)



The unconverted means of all domains, including *overall QoL and general health,* were compared to community means from the WHOQOL Australian field test (Murphy et al 2000) (Table 3); note these scores are from a possible range of 4-20. The differences between mean scores for both groups were not statistically significant in the domains of *overall QoL and general health*, *psychological health or social relationships*. However, the residential care group's mean score for *independence* was nearly four points lower than the WHOQOL field test sample, which was highly significant (t^{380}=10.38, p<0.0001). The differences in mean scores for three other domains were also statistically significant; the residential care mean for the *spiritual* domain was just over one point lower than the general population mean (t^{380}=2.74, p<0.02), while mean scores for the residential care group were significantly higher in two domains - *physical health* (t^{380}=2.72, p<0.02) and *environment* (t^{380}=2.62, p<0.02)

Table 3: Sample WHOQOL-100 Domain Scores [Mean (SD)] and results from the Australian field test (Murphy et al 2000, p. 16)

Domain	Sample (n=82)	WHOQOL Field Test (n=300)†	Statistics	
			t	p
Overall QoL and General Health	14.0(3.5)	14.7(2.7)	1.94	0.05
Physical Health	15.0(2.5)	14.1(2.7)	2.72	0.01*
Psychological Health	14.5(2.1)	14.7(2.1)	0.76	0.45
Independence	12.4(2.7)	16.2(3.0)	10.38	<0.0001**
Social Relationships	14.8(1.9)	14.8(2.7)	0	1.0
Environment	15.6(1.6)	15.0(1.9)	2.62	0.01*
Spiritual	13.0(3.9)	14.2(3.4)	2.74	0.01*

(†) (Murphy et al 2000), (*) Significant, (**) Highly significant

As previous research indicated relationships between QoL and age, gender, care level, length of stay and living arrangements (Courtney et al 2003), these were tested statistically by correlation and t-test analyses. However, no significant associations were found.

QoL and Clinical Indicators

Individual Clinical Care Indicators

Independent t-test analyses were calculated for each clinical care indicator (CCI) and each domain of the WHOQOL-100[1], with a number of significant results found (adjusted α=0.02). The CCIs cognitive decline, ADL decline and sensory decline were not included for analysis, as these are incidence indicators, requiring follow-up data.

Most noteworthy was dehydrated residents recorded poorer QoL for all WHOQOL domains, with the differences for three domains (social, environment and spiritual) being significant (see Table 4).

Table 4: Association between dehydration and QoL domains – independent t-test analyses

WHOQOL-100 Domain	Dehydration Present	N	Domain Score Mean	Significance (α=0.02)	
				t	p
Overall QoL	No	55	14.5(2.9)	10.1	0.06
	Yes	10	11.0(5.1)		
Physical (0-100)	No	54	68.8(14.6)	2.0	0.05
	Yes	9	57.9(18.6)		
Psychological (0-100)	No	50	67.2(11.3)	2.5	0.02
	Yes	10	56.9(15.6)		
Independence (0-100)	No	52	54.5(17.2)	2.3	0.04
	Yes	9	41.3(15.6)		
Social (0-100)	No	36	68.3(10.2)	3.4	0.002**
	Yes	4	49.5(14.4)		
Environment (0-100)	No	47	74.1(8.3)	3.8	0.000**
	Yes	9	61.6(12.2)		
Spiritual (0-100)	No	56	59.4(23.3)	2.9	0.005**
	Yes	10	36.3(23.9)		

(*) Significant, (**) Highly significant

Occurrence of falls in the last month was also associated with significantly poorer QoL in three domains - psychological (means 55.4, 68.1), t^{58}=3.3, p=0.002; environment (64.8, 73.6), t^{54}=2.5, p=0.015; and spiritual (34.7, 59.0), t^{63}=2.9, p=0.005.

Presence of depressive symptoms was significantly associated with decreased QoL in two domains - overall QoL/ general health (means: 12.1, 14.9), $t^{27.9}$=2.2, p=0.012 and independence (43.0, 58.1), t^{60}=3.6, p=0.001.

Finally, participation in little/no activity was associated with significantly decreased QoL in the environment domain (means: 63.1, 73.5), t^{54}=2.7, p=0.009 and use of sedatives was associated with

---

[1] Due to small sample sizes, Mann-Whitney U-tests were used to analyse 'significant visual loss without aid' and 'significant hearing loss without aid'. No significant associations were found.

significantly poorer QoL scores in the social domain (means: 60.1, 70.3), $t^{38}=2.8$, $p=0.008$.

Thus, overall, improved clinical outcomes were associated with better QoL. This was further confirmed by exploring the association between the number of problem clinical areas and QoL scores.

Total Number of Clinical Problems

The total number of problem indicators (i.e. CCI items with the problems present) was calculated for each resident. This was normally distributed, with the number of problem indicators triggered ranging from one to sixteen (of 27)[2], with a mean of 6.7 (SD=3.1). Pearson's product moment coefficients (r) were calculated between number of problem indicators and scores for each of the QoL domains. All resultant correlations were in the negative direction, indicating poorer QoL was associated with increasing numbers of clinical problems, although not all were statistically significant.

A slight, but significant negative correlation occurred between number of problem indicators and *overall QoL/general health* ($r = -0.32$, $p=0.01$), with the r^2 value of 0.10 suggesting number of problem indicators contributed to 10% of the variance in overall QoL/ general health scores.

A moderate and significant negative correlation occurred between number of problem indicators and the *independence* domain ($r = -0.42$, $p=0.001$). In this case, $r^2=0.18$ suggests the number of problem indicators contributed to 18% of the variance in scores for this domain. Inspection of the scatter plot revealed a noticeable negative trend in QoL scores as number of problem indicators increased.

A slightly stronger significant, negative correlation also occurred between number of problem indicators and the *social* domain ($r = -0.47$, $p=0.002$), with an r^2 value of 0.22 suggesting that number of problem indicators contributed to 22% of the variance in social QoL. Inspection of the scatter plot revealed a more defined negative trend in QoL scores in relation to number of problem indicators.

DISCUSSION

Results for this group of residents suggested they were experiencing moderate QoL, with a few differences from the general community; scores in the *independence* and *spiritual* domains were significantly lower for the residents, while resident scores in the *physical health* and *environment* domains were significantly higher than general community scores. This reflects the reasons for moving into residential care – diminished independence and the desire for a greater sense of security, with residents reporting heightened feelings of security once the move was made (Edwards et al 2003). Comparing CCI results to WHOQOL scores suggested poorer clinical outcomes adversely influenced QoL. All WHOQOL domains were affected to varying degrees, with the most impact being felt by the *social* and *spiritual* domains. This suggests poorer clinical status might make it more difficult to engage socially and to maintain a sense of spiritual wellbeing.

Some clinical areas had more influence over QoL than others, with poorer status in *hydration, falls* and *depression* being most strongly associated with lower QoL scores, suggesting those three indicators could represent key areas for clinical management in residential aged care. To a lesser extent, QoL was also affected by activity and use of sedatives. Poor clinical outcomes over all (as measured by total number of problem indicators) were also correlated with poorer QoL. Further, a number of other clinical indicator/QoL associations approached significance with $\alpha=0.02$; a larger study might thus find a greater number of significant associations. These results can be considered particularly illuminating; given the CCI data was based on professional assessment and collected separately to the QoL data, which was based on self-report, making it unlikely responses for one instrument contaminated responses for the other.

Thus, it appears maintaining optimum clinical status would not only be important for resident health but also for enhancing QoL.

---

[2] Again, cognitive decline, ADL decline and sensory decline were not included, due to being incidence indicators.

Limitations

There were a number of factors in this study that would both limit the accuracy of interpretation and the ability to generalise results. The resident sample was not randomly selected; resulting in a sample diverged from the national residential care figures in some areas. Further, the necessity for the sample to be limited to residents with adequate cognitive/sensory functioning created a sampling bias. However, as in most QoL studies with older people, this is a difficult issue to avoid, due to the limited availability of QoL assessments appropriate for those groups. Finally, the sample size was small, further limiting the generalisability of results. Thus, to develop a more accurate picture of QoL issues within residential aged care facilities and their relationship to staff practices, data would need to be gathered from a larger number of facilities than the four sampled in this study.

CONCLUSION AND RECOMMENDATIONS

Despite some limitations, this study highlighted an aspect of resident care warranting further investigation. The CCI Tool was developed to indicate potential problems in care delivery within residential facilities. This study has shown the clinical areas assessed are also related to QoL, which suggests the value inherent in monitoring clinical outcomes on a regular basis.

As an exploratory study, this project has begun the process of investigating links between quality of life and quality of care within residential aged care. However, it is an area of research that requires more attention, particularly in the Australian context. As such, the following should be considered:

1. Collect and analyse CCI data in a greater number of facilities on several occasions. This would enable data to be analysed more accurately, including incidence data;
2. Collect QoL data concurrent with CCI data on a wider scale to further analyse the relationship between clinical outcomes and QoL; and
3. Establish ongoing monitoring of clinical care and outcomes to ensure optimum resident quality of life.

If adequate attention can be paid to quality clinical care within residential aged care facilities, it appears resident quality of life could also be enhanced. However, such care requires quality assessment on a regular basis to ensure it is achieving what it is meant to. At present, there is no comprehensive system for monitoring quality within Australian residential aged care facilities beyond Accreditation. This gap clearly requires addressing if Australia is to achieve world class care of its older citizens.

REFERENCES

Arnold, S.B. 1991. Measurement of quality of life in the frail elderly. In *The concept and measurement of quality of life in the frail elderly*., edited by J.E. Birren, J.E. Lubben, J.C. Rowe and D.E. Deutchman. San Diego: Academic Press.

Australian Institute of Health and Welfare (AIHW). 2008. *Residential aged care in Australia 2006-07: A statistical overview* AIHW: Canberra.

Bartlett, H. and Burnip, S. 1998. Quality of care in nursing homes for older people: Providers' perspectives and priorities. *NT Research,* 3(4):257-268.

Bowling, A. 2007. Quality of life in older age: What older people say. In *Quality of life in old age: International and multi-disciplinary perspectives*, edited by H. Mollenkopf and A. Walker. Dordrecht, The Netherlands: Springer.

Byrne, H. and MacLean, D. 1997. Quality of life: Perceptions of residential care. *International Journal of Nursing Practice* 3 (1):21-8.

Carr, A.J. and Higginson, I.J. 2001. Measuring quality of life: Are quality of life measures patient centred? *British Medical Journal,* 322 (7298):1357-1360.

Courtney, M., Edwards, H., O'Reilly, M., Duggan, C. and Lucke, J. 2003. Ensuring quality in aged care residential facilities: Examination of the relationship between clinical care indicators and quality of life of residents living in aged care facilities. (Preliminary Report: Phases One and Two). Queensland University of Technology/ Uniting Care Australia: Brisbane.

Courtney, M., Edwards, H., Stephan, J., O'Reilly, M. and Duggan, C. 2003. Quality of life measures for residents of aged care facilities: A literature review. *Australasian Journal on Ageing,* 22(2):58-64.

Courtney, M., O'Reilly, M.T., Edwards, H. and Hassall, S. 2007. Development of a systematic approach to assessing quality within Australian residential aged care facilities: The Clinical Care Indicators (CCI) Tool. *Australian Health Review,* 31(4):582-91.

Courtney, M. and Spencer, L. 2000. What's best? Clinical indicators of quality in residential aged care facilities. *Collegian,* 7(2):14-19.

Donabedian, A. 1992. The role of outcomes in quality assessment and assurance. *QRB: Quality Review Bulletin,* 18(11):356-360.

Donabedian, A. 1988. The quality of care. How can it be assessed? *Journal of the American Medical Association,* 260(12):1743-1748.

Donabedian, A. 1987. Commentary on some studies on the quality of care. *Health Care Financing Review.* Spec No:75-85.

Doyle, C. and Carter, M. 1992. *Consumer and provider views on assessing the quality of residential aged care.* (Working Paper). Centre for Health Program Evaluation: Melbourne.

Edwards, H., Courtney, M. and O'Reilly, M. 2003. Involving older people in research to examine quality of life in residential aged care. *Quality in Ageing,* 4(4):38-43.

Guse, L.W. and Masesar, M.A. 1999. Quality of life and successful aging in long-term care: Perceptions of residents. *Issues in Mental Health Nursing,* 20(6):527-539.

Hambleton, P., Keeling, S. and McKenzie. M. 2009. The jungle of quality of life: Mapping measures and meanings for elders. *Australasian Journal on Ageing,* 28(1):3-6.

Harrington, C., Mullan, J., Woodruff, L.C., Burger, S.G., Carillo, H. and Bedney, B. 1999. Stakeholders' opinions regarding important measures of nursing home quality for consumers. *American Journal of Medical Quality,* 14(3):124-132.

Kane, R.A. 2001. Long-term care and a good quality of life: Bringing them closer together. *The Gerontologist,* 41(3):293-304.

Karon, S.L. and Zimmerman, D.R. 1996. Using indicators to structure quality improvement initiatives in long-term care. *Quality Management in Health Care,* 4(3):54-66.

Karon, S.L. and Zimmerman, D.R. 1998. Nursing home quality indicators and quality improvement initiatives. *Topics in Health Information Management,* 18(4):46-58.

Marquis, R. 2002. Quality in aged care: A question of relational ethics. *Australasian Journal on Ageing,* 21(1):25-29.

McDowell, I. 2006. Measuring health: A guide to rating scales and questionnaires 3rd ed. Oxford: Oxford University Press.

Mor, V. 2005. Improving long term care quality through better information. Paper presented at "Building Great Assessment Systems: Lessons from the interRAI Collaborative", Gold Coast, 16-17 June 2005. [Web Page]. interRAI Australia 2005 [cited 31 July 2005]. Available from http://www.interrai-au.org/ConfPresentations.htm.

Mor, V., Angelelli, J., Gifford, D., Morris, J. and Moore, T. 2003. Benchmarking and quality in residential and nursing homes: Lessons from the US. *International Journal of Geriatric Psychiatry,* 18(3):258-266.

Murphy, B., Herrman, H., Hawthorne, G., Pinzone, T. and Evert, H. 2000. *Australian WHOQoL instruments: User's manual and interpretation guide.* Melbourne: Australian WHOQoL Field Study Centre.

O'Reilly, M., Courtney, M. and Edwards, H. 2007. How is quality being monitored in Australian residential aged care facilities? A narrative review. *International Journal for Quality in Health Care,* 19(3):177-182.

Ottenbacher, K. 1988. Multiplicity in rehabilitation research: A quantitative assessment. *Archives of Physical and Medical Rehabilitation,* 69 (3):170-173.

Rai, G.S., Jetten, E., Collas, D., Hoefnagels, W., Froeling, P. and Bor, H. 1995. Study to assess quality of life (morale and happiness) in two continuing care facilities: A comparative study in the UK and the Netherlands. *Archives of Gerontology and Geriatrics,* 20(3):249-253.

Vaarama, M., Pieper, R. and Sixsmith, A. 2007. Care-related quality of life: Conceptual and empiracal exploration. In *Quality of life in old age: International and multi-disciplinary perspectives*, edited by H. Mollenkopf and A. Walker. Dordrecht, The Netherlands: Springer.

Walker, A. and Mollenkopf, H. 2007. International and multidisciplinary perspectives on quality of life in old age: Conceptual issues. In *Quality of life in old age: International and multi-disciplinary perspectives*, edited by H. Mollenkopf and A. Walker. Dordrecht, The Netherlands: Springer.

Weissman, N.W., Allison, J.J., Kiefe, C.I., Farmer, R.M., Weaver, M.T., Williams, O.D., Child, I.G., Pemberton, J.H., Brown, K.C. and Baker, C.S. 1999. Achievable benchmarks of care: The ABCs of benchmarking. *Journal of Evaluation in Clinical Practice,* 5(3):269-281.

WHOQOL Group. 1993. Study protocol for the World Health Organization project to develop a Quality of Life assessment instrument (WHOQOL). *Quality of Life Research,* 2 (2):153-159.

WHOQOL Group. 1994a. Development of the WHOQOL: Rationale and current status. *International Journal of Mental Health,* 23(3):24-56.

WHOQOL Group. 1994b. The development of the World Health Organization Quality of Life Assessment Instrument (the WHOQOL). In *Quality of life assessment: International perspectives.* edited by J. Orley and W. Kuyken. Heidelberg: Springer-Verlag.

WHOQOL Group. 1995. The World Health Organization Quality Of Life Assessment (WHOQOL): Position paper from the World Health Organization. *Social Science and Medicine,* 41(10):1403-1409.

WHOQOL Group. 1998. The World Health Organization quality of life assessment (WHOQOL): Development and general psychometric properties. *Social Science and Medicine,* 46(12):1569-1585.

Zimmerman, D.R., Karon, S.L., Arling, G., Clark, B.R., Collins, T., Ross, R. and Sainfort, F. 1995. Development and testing of nursing home quality indicators. *Health Care Financing Review,* 16(4):107-127.