

# Assessing Functional Status and Quality of Life in Older Adults

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# Basic definitions

- Functional status:

- the ability to function in the arena of everyday living  
(1987 NIH Consensus Panel)

- Quality of Life:

- “an individual’s perceptions of their position in life in the context of culture and value systems in which they live, and in relation to their goals, expectations, standards and concerns” (World Health Organization Quality of Life Group, 1995)
- the degree to which a person enjoys the important possibilities of his/her life (University of Wales, 2006)

# Levels of functional status

- Basic activities of daily living (BADL)
  - the ability to perform basic self-care tasks
  - Examples: eating, dressing, bathing, toileting
- Instrumental (intermediate) activities of daily living (IADL)
  - the ability to live independently
  - Examples: housework, laundry, transportation
- Advanced activities of daily living (AADL)
  - the ability to fulfill societal, community, and family roles, and participate in recreational or occupational tasks

# Examples of functional status questionnaires

- Katz BADL
- Barthel Index
- Functional Independence Measure (FIM)
- Lawton IADL
- OARS Multidimensional Assessment Questionnaire
- COOP Charts
- Functional Status Questionnaire

# How is quality of life measured?

- Most scales self-reported
- Usually multiple items
- Can be 'generic' or 'specific' (to a disease or population)
- Generally includes multiple domains
  - Health
  - Physical functioning
    - Functional status is often a component
  - Psychological and social functioning
    - May include emotional well-being and comfort

# What is health-related quality of life (HRQOL)?

- Those elements of health, function and well-being that are experienced by people in the context of their health conditions and treatment

*(Kaplan and Bush. Health Psychology, 1982)*

# Examples of measures of health/health-related quality of life

- Medical Outcomes Study Short Form (several versions)
  - SF36, SF-36v2, SF12, SF12v2, etc.
- World Health Organization Quality of Life Group (several versions)
  - WHOQOL-100, WHOQOL-BREF
- Sickness Impact Profile
- Patient Reported Outcomes Measurement Information System (PROMIS) Global Health Measure
- Functional Limitations Profile (FLP)
- EuroQol (EQ-5D)

# Examples of sleep-specific quality of life measures

- Functional Outcomes of Sleep Questionnaire
- Calgary Sleep Apnea Quality of Life Index
- Obstructive Sleep Apnea Patient-Oriented Severity Index

# Significance

- Many older adults report that “living well’ is as important (or more important) to them as “living long”
- In older adults, functional status predicts mortality, health care costs, nursing home placement and other outcomes.
- Effects of illness and treatment options on quality of life are essential for medical decision-making in older adults.

# State-of-the-Art Knowledge

# Sleep and functional status in older adults

# Daytime sleepiness is associated with functional status impairment in older adults

*(Gooneratne et al. J Am Geriatr Soc. 51:642-649, 2003)*

- Case-control study: 76 cases with self-reported daytime sleepiness, 38 without (mean age 77.7  $\pm$  5.9 years)
- Measure of functional status: Functional Outcomes of Sleep Questionnaire (FOSQ)
- Results: Sleepiness had a moderate to large negative effect (effect size range 0.59 – 0.83) on FOSQ domains of social outcome, general productivity, vigilance, activity level and global assessment of functional status

# Worse Sleep is Associated with Lower Physical Function Measures in Older Men

*(Dam et al. J Am Geriatr Soc 56:1665–1673, 2008)*

- Descriptive study of 2,862 community-dwelling men (mean age 76.4 years, range 67-97)
  - The Osteoporotic Fractures in Men (MrOS) Sleep Study
- Measures: several physical performance measures of function, PSG, actigraphy, other measures
- Results:
  - In adjusted analyses, lower grip strength and slower walking speed were associated with:
    - Actigraphy: WASO  $\geq$  90 minutes; sleep efficiency  $<$  80%
    - PSG: greater percent of sleep time with O<sub>2</sub> sat  $<$  90%

# A longitudinal examination of sleep quality and physical activity in older adults

*(Holfeld and Ruthig. J Applied Gerontol. 33:791-807, 2014)*

- Design: 2-year, descriptive, longitudinal study of 426 community-dwelling adults (aged 61 – 100 years)
- Sleep measure: 5 self-reported sleep items (overall quality of sleep, difficulty falling asleep, nighttime awakening, wake up too early, and wake feeling unrefreshed)
- Physical activity measure: 1 self-reported item (rate your physical activity from 1 [extremely inactive] to 7 [extremely active])
- Results: In hierarchical regression analyses:
  - Initial physical activity did not predict later sleep quality after accounting for prior sleep quality
  - Better initial sleep quality predicted higher levels of later physical activity beyond the effects of prior physical activity.

# Sleep and Everyday Functioning in Older Adulthood

*(Parsey et al. J Applied Gerontol 34:48-72, 2015)*

- Design: Cross-sectional, descriptive study of 85 community-dwelling, cognitively healthy adults aged 50 – 86 years
- Sleep measures: Wrist actigraphy and sleep diary for 7 days; Pittsburgh Sleep Quality Index
- Functional status measures: Everyday Problems Test (questionnaire), Lawton Instrumental Activities of Daily Living Scale (questionnaire), and Direct Observation of Everyday Activities (observed performance)
- Results:
  - No significant correlations between sleep measures and functional status.
  - In multiple regression analyses, sleep measures did not predict functional status.

# Worse sleep (by actigraphy) is associated with ADL/IADL impairment Among Older Veterans in Adult Day Healthcare

(*Song et al. J Am Geriatr Soc. 63(8):1622-7, 2015*)

- Descriptive study, N=50 veterans in adult day healthcare (mean age 77 years, range 60 – 97; MMSE > 15)
- Measures: ADL and IADL total scores (OARS), Pittsburgh Sleep Quality Index, Insomnia Severity Index, and wrist actigraphy
- Results:
  - PSQI and ISI did not predict ADL/IADL
  - In (adjusted) nested regression analyses, worse combined ADL and IADL total score was associated with actigraphic measures of worse sleep (longer total sleep time, more awakenings, longer total wake time) ( $R^2 = 46.4\%$ , adjusted  $R^2 = 0.344$ ,  $p=.03$ ).

# Sleep and quality of life in older adults

# Numerous studies have demonstrated an association between sleep and quality of life in older adults

Study	Sample	QOL measure	Sleep measure	Findings
Zammit 1999	N=362 (18 – 75 years)	SF-36	12-item sleep questionnaire	Insomnia group had worse SF-36
Schubert 2002	N = 2,800 (53 – 97 years)	SF-36	3 insomnia questions	Insomnia associated with worse SF-36, summary scores and every domain
Stewart 2006	N = 8,580 (16 – 74 years)	SF-12	Clinical Interview Schedule defined insomnia	Insomnia had stronger association with worse QOL in older age groups

# Sleep complaints are more strongly associated with worse quality of life in older adults with greater comorbidity

*(Fagerstrom and Hellstrom. Aging Ment Health. 15204-213, 2011)*

- Descriptive study: N = 1,128 people in Sweden (age 60 – 96 years)
- Measures: 10 questions about quantity and quality of sleep; SF-12 (quality of life); diagnoses from medical record (comorbidity)
- Results: Worse QOL associated with several sleep complaints (e.g., nighttime awakening, sleep difficulties due to mood, daytime sleepiness); especially in those with greater comorbidity

# Short and long sleep duration are associated with worse quality of life in older adults

*(Magee et al. Sleep Medicine. 12:346-350, 2011)*

- Design: Cross-sectional analysis of 63,408 subjects (aged 45-95 years) from the '45 and Up Study' (2006-2008) in Australia
- Sleep measure: 1 self-report item of sleep duration in each 24 hour day (night and naps)
- QOL measure: 1 self-report item of quality of life (excellent/very good/ good *versus* fair/poor)
- Results: In multinomial logistic regression models, compared to 7-8 hrs of sleep:
  - Short (< 6 hrs, 6 hrs) and long sleep ( $\geq$  9 hrs) were associated with poor quality of life in unadjusted and adjusted models in the total sample and in age categories 45 – 84 years, but not in the 85-95 year age group.

# Knowledge Gaps

- What are the most appropriate measure(s) of functional status and quality of life in studies of sleep among older adults?
- Traditional functional status measures have not been used extensively in sleep research among older adults.
- Are currently available measures of functional status and quality of life sensitive to change in treatment studies of sleep problems in older adults, particularly across race/ethnicity, gender, and comorbidity?

# Research Opportunities

- Functional status and quality of life outcomes are needed in treatment studies and interventional sleep research among older adults, particularly across categories of race/ethnicity, gender, health conditions, and the growing number of oldest old.
- Methods are needed to incorporate patient preferences regarding functional status and quality of life outcomes when choosing among treatment options for sleep problems.