

## Application of the International Classification of Functioning to Factors Associated With Falls in Older Women

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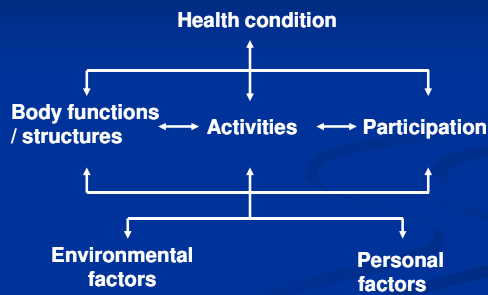
## Background

- Falls and fall injury among older people continues to be an important health problem
- Risk factors that contribute to falls and fall injury are complex
- The application of a holistic approach to identify, assess, and manage these risk factors is needed.
- The ICF is an internationally accepted coding system that can be used as a theoretical model to explain health, taking into account the social and personal contexts of health



## Background

- The ICF (WHO, 2001)



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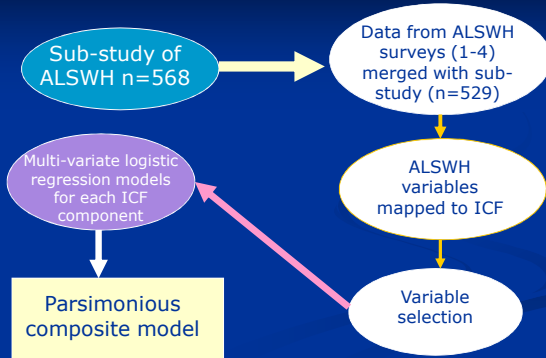
- Data from the older cohort of Australian Longitudinal Study of Women's Health (Women's Health Australia) were used.
- Participants were randomly selected from the database of the Health Insurance Commission across Australia.
  - Survey 1 1996 (12,432) aged 70-75
  - Survey 2 1999 (10,433) aged 73-78
  - Survey 3 2002 (8,647) aged 76-81
  - Sub-study 2004 (568) aged 78-83
  - Survey 4 2005 (6,911) aged 79-84
- Surveys covered socio-demographic, physical, psychological and behavioural aspects of health consistent with the domains of the ICF

| Variable categories           | S1 | S2 | S3 | Sub-study | S4 |
|-------------------------------|----|----|----|-----------|----|
| SF36                          | *  | *  | *  |           | *  |
| Using health services         | *  | *  | *  |           | *  |
| Coping with problems          | *  | *  | *  |           | *  |
| Healthy weight and shape      | *  |    |    |           |    |
| Juggling time                 | *  |    |    |           |    |
| Family and friends            | *  | *  | *  |           | *  |
| Personal information          | *  |    |    |           |    |
| Healthy lifestyle             |    | *  | *  |           | *  |
| You and your life             |    | *  |    |           |    |
| Giving and getting help       |    | *  |    |           |    |
| Managing day by day           |    |    | *  |           | *  |
| Home and neighbour            |    |    | *  |           | *  |
| Health in the past/daily life |    |    |    |           | *  |
| Home environment              |    |    |    | *         |    |
| Fear of falls and ADL         |    |    |    | *         |    |

## Aims of the project

- To evaluate the application of the ICF as a theoretical framework to understand falls risk
- To empirically test the capacity of the ICF to identify falls risk factors for older women using the Australian Longitudinal study of Women's Health (ALSWH) cohort dataset.

## Method



## Results: sample characteristics

- Mean age 79.7 years
- 42% married and 48% widowed
- 52% live alone
- 61% live in a rural or remote area
- 73% live in a house, 17% in a flat/apartment and 9% in a retirement village
- 37% live in NSW, 23% in Victoria, 18% in Queensland, 9% in SA and 8% in WA
- 20% (n=103) reported a fall in the previous six months, and 67 reported an injury related to the fall

## Results – Final body function sub-model (n=463, p=0.0001)

| Variable                             | OR (95% C.I)     |
|--------------------------------------|------------------|
| Often sad & lonely                   | 2.72 (1.24-5.46) |
| Ever had breathing difficulty        | 1.89 (1.15-3.11) |
| Visual problems                      | 1.87 (1.07-3.26) |
| Arthritis/pain/fatigue medication    | 2.03 (0.75-5.45) |
| Hearing difficulty                   | 1.78 (0.95-3.31) |
| Chronic disease/digestion medication | 1.60 (0.93-2.74) |
| High blood pressure medication       | 1.46 (0.88-2.39) |
| Difference in role emotional score   | 0.99 (0.98-1.0)  |

## Results – Final Activity and Participation sub-model (N=506, p=0.005)

| Variable                                | OR (95% C.I)     |
|---|------------------|
| Lambeth Disability Score                | 1.12 (1.06-1.20) |
| Break up of a close relationship        | 2.45 (0.77-7.81) |
| Gets around unaided                     | 1.53 (0.74-3.16) |
| Hearing interferes with social activity | 1.54 (0.97-2.47) |
| Attends classes                         | 0.70 (0.37-1.31) |

## Results – Final Environment sub-model (N=476, p=0.002)

| Variable                      | OR (95% C.I)     |
|-------------------------------|------------------|
| Needs help for daily tasks    | 2.04 (1.19-3.48) |
| HOME FAST score               | 1.07 (0.99-1.16) |
| Family problems               | 1.59 (0.89-2.83) |
| Public transport availability | 0.53 (0.24-1.16) |
| Income from business          | 0.48 (0.17-1.34) |
| Need help for odd jobs        | 0.94 (0.48-1.81) |

## Results – Final model for personal sub-model (N=469, p=0.12)

| Variable                       | OR (95% C.I)     |
|--------------------------------|------------------|
| Income management              | 0.61 (0.36-1.04) |
| Makes decisions about own life | 0.52 (0.2-1.36)  |
| Education                      | 0.65 (0.39-1.07) |
| Life orientation test          | 0.95 (0.89-1.02) |

## Results – Final Health Conditions sub-model (N=513, p=0.004)

| Variable       | OR (95% C.I)     |
|----------------|------------------|
| Depression     | 2.83 (1.17-6.83) |
| Knee surgery   | 2.46 (1.09-5.56) |
| Low iron level | 2.29 (1.28-4.09) |
| Cataract       | 1.97 (1.21-3.21) |
| Diabetes       | 0.47 (0.18-1.20) |
| Heart disease  | 2.13 (0.92-4.95) |
| Hypertension   | 1.46 (0.91-2.36) |
| Bronchitis     | 2.08 (0.84-5.1)  |

## Results – Final “not covered” and “general health” sub-models

| Variable   | OR (95% C.I)     |
|--|------------------|
| <b>“Not covered” sub model</b>                     |                  |
| Decline/death of spouse                            | 1.54 (0.90-2.62) |
| Decline/death of family or friend                  | 1.54 (1.0-2.39)  |
| <b>“General health” sub-model</b>                  |                  |
| Major illness/injury in last 3 years               | 2.15 (1.12-4.11) |
| Most time spent in chair/bed because of ill health | 1.98 (1.23-3.19) |
| Times to visit GP last year (>8)                   | 2.15 (0.81-5.7)  |
| Teeth/swallowing problems interfere with eating    | 2.02 (0.87-4.69) |

## Results – final parsimonious model of factors predictive of falls using the ICF

| Variable   | OR (95% C.I)     |
|--|------------------|
| <b>Health conditions</b>                           |                  |
| Diabetes   | 0.14 (0.04-0.55) |
| Low iron level                                     | 2.00 (1.03-3.91) |
| Cataract   | 2.06 (1.19-3.55) |
| <b>Body function</b>                               |                  |
| High blood pressure medication                     | 1.71 (1.01-2.88) |
| <b>Environment</b>                                 |                  |
| HOME FAST score                                    | 1.11 (1.02-1.20) |
| <b>General health</b>                              |                  |
| Major illness/injury in last three years           | 2.91 (1.45-5.84) |
| Most time spent in chair/bed because of ill health | 1.99 (1.14-3.49) |
| <b>Activity and Participation</b>                  |                  |
| Lambeth Disability score                           | 1.09 (1.01-1.17) |

## Implications

- A variety of falls risk factors contributed to the final model across the ICF components
- 6 out of 8 risk factors were medically focused
- The home environment and functioning in daily activities remained significant risk factors
- Population level falls prevention programs should incorporate these risk factors
- Home environmental and ADL related interventions may be useful in lower risk populations

## Limitations

- The health risk factors were self-reported by participants using surveys.
- Outcome of falls also self-reported
- Missing data may have reduced the power to detect associations for some potential risk factors
- Linking rules for the ICF required consensus to be applied reliably
- No classification for Personal Factors in the ICF
- Whilst falls are classified in the ICD10 definitions, they are not classifiable in the ICF
- Original data collection tools used in the ALSWH were not designed according to the ICF definitions
- Men were not included in the study

## Conclusions

- A biopsychosocial model such as the ICF can be used to predict falls at a population level of community dwelling women
- Results suggest that a broad, holistic approach to falls risk factors is justified that includes the home environment and ADL functioning
- Results underpin the importance of a multi-disciplinary approach to falls prevention
- The ICF needs to be revised and extended to include definitions that can be used in everyday health professional practice

## References

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