## Duke Social Support Index

| | |
|---|---|
| **Age Cohorts** | Older |
| **Surveys** | Surveys 1 & 2 |
| **Derived Variable** | DSSIsoci |
| **Definition** | 4-item, summed score measuring social interaction |
| **Source Items (Index Numbers)** | DSSI_1 to DSSI_4 (FAMF-025 & FAMF-041 to -043) |
| **Statistical form** | Continuous variable |
| **Index Number** | FAMF-124 |
| **Derived Variable** | DSSIsupt |
| **Definition** | 6-item, summed score measuring satisfaction with social support |
| **Source Items (Index Numbers)** | DSSI_5 to DSSI_10 (FAMF-026, FAMF-027, FAMF-044 to FAMF-047) |
| **Statistical form** | Continuous variable |
| **Index Number** | FAMF-125 |
| **Derived Variable** | DSSI |
| **Definition** | 10-item, summed score measuring social support |
| **Source Items (Index Numbers)** | DSSI_1 to DSSI_10 (FAMF-025 to FAMF-027 and FAMF-041 to FAMF-047) |
| **Statistical form** | Continuous variable |
| **Index Number** | FAMF-125 |
| **Prepared by** | Jennifer Powers, Brendan Goodger and Julie Byles |
| **Endorsed** | 20 May 2004 |

Note: DSSI_11 which is not used in derived variables has Index Number FAMF-048

**Background**

It is generally agreed that social networks and support are important for older people.[1] Social networks consist of family and friends and tend to be larger for older women than for older men.[2] As well as instrumental support, these networks provide friendships, confidence and expressive support that make older women feel supported emotionally.

Social support is not only correlated with socio-demographic factors such as age, marital status, living arrangements and income, but it has also been found to be important to the health of older people.[1,3] Among older adults, higher social support has been associated with better physical and mental health and reduced mortality risks.[4,5] Some studies suggest that lower social support could be associated with higher use of health and social services[6] and premature admission to institutional care.[7]

Despite the importance of social support, few social support scales have been developed and used with older people. A review of the literature from 1970 to 1998 revealed the 11-item Duke Social Support Index (DSSI) was the only short scale written in English and validated for use with older people.[8]

**The DSSI**

The DSSI was developed in the United States as a brief, easily administered instrument to determine an individual's level of social support.[9] Details of wording, response options and scoring for the scale were not included in the original publication, but were supplied to ALSWH by Koenig (personal communication, Brendan Goodger, 10 October 1996). There were no instructions concerning missing items.

The DSSI's reliability and validity have been confirmed in a sample of community dwelling older Australian men and women.[10] Two sub-scales, social interaction and satisfaction with social support (subjective support), were identified.

**Source items**

The form of the DSSI items used in ALSWH survey is shown below.

*Social interaction sub-scale*

DSSI_1 Other than members of your family how many persons in your local area do you feel you can depend on or feel very close to?

| Code | Response |
|---|---|
| 1 | None |
| 2 | 1-2 people |
| 3 | More than 2 people |

DSSI_2 How many times during the past week did you spend time with someone who does not live with you, that is, you went to see them or they came to visit you or you went out together?

DSSI_3 How many times did you talk to someone (friends, relatives or others) on the telephone in the past week (either they called you, or you called them)?

DSSI_4 About how often did you go to meetings of clubs, religious meetings, or other groups that you belong to in the past week?

| Code | Re-code Item 2 | Re-code Items 3 & 4 | Response |
|---|---|---|---|
| 0 | 1 | 1 | None |
| 1 | 2 | 1 | Once |
| 2 | 2 | 2 | Twice |
| 3 | 3 | 2 | Three times |
| 4 | 3 | 2 | Four times |
| 5 | 3 | 2 | Five times |
| 6 | 3 | 3 | Six times |
| 7 | 3 | 3 | Seven or more times |

*Satisfaction with social support sub-scale*

| | |
|---|---|
| DSSI_5 | Does it seem that your family and friends (people who are important to you) understand you |
| DSSI_6 | Do you feel useful to your family and friends (people important to you)? |
| DSSI_7 | Do you know what is going on with your family and friends? |
| DSSI_8 | When you are talking with your family and friends, do you feel you are being listened to? |
| DSSI_9 | Do you feel you have a definite role (place) in your family and among your friends? |
| DSSI_10 | Can you talk about your deepest problems with at least some of your family and friends? |

| Code | Response |
|---|---|
| 1 | Hardly ever |
| 2 | Some of the time |
| 3 | Most of the time |

DSSI_11 How satisfied are you with the kinds of relationships you have with your family and friends?

| Code | Response |
|---|---|
| 1 | Very dissatisfied |
| 2 | Somewhat dissatisfied |
| 3 | Satisfied |

***Sub-scale and Index Calculations***
The social interaction sub-scale is calculated as the sum of re-coded scores for items 1 to 4; the sub-scale ranges from 4 to 12 with higher scores indicating more social interaction; there is no imputation of missing items. The subjective support sub-scale is calculated as the sum of codes for items 5 to 11; the subscale ranges from 7 to 21 with higher scores indicating more social support; there is no imputation of missing items. A score for Duke social support index is calculated as the sum of 11 items with mean imputation for up to two missing items.

**Scale Evaluation**

The DSSI was included in the first survey of the Older cohort of the ALSWH.

*Item responses*
Of the 12 939 older women who returned Survey 1, 12 223 (94.5%) completed all the DSSI items and another 347 (2.7%) missed one or two items. Percentages who gave the highest scored response for each of the DSSI items are shown in Table 1. Despite the majority of women being 'satisfied' most of the time with their relationships with family and friends, almost 14% answered 'very dissatisfied' to the item about satisfaction with "kinds of relationships". This was contrary to the pattern of responses for the other 'satisfaction' items, where endorsement of the lowest response was very low (1% to 6%). Many felt they could depend on at least two other people or spent time with at least two people in the past week, although few women (2% to 3%) went to religious meetings, clubs or other meetings more than five times a week. Responses to individual items were missing for between 1% and 3% of respondents.

*Internal reliability*
The overall sampling adequacy for the two factors was good (Kaiser's measure of sampling adequacy = 0.85). Cronbach's alpha coefficients of 0.80 for the 'satisfaction' factor, and 0.58 for 'interaction' factor and 0.76 the 10 DSSI items indicated reasonable internal reliability.

*Factor Analysis*
Exploratory factor analyses using the principal components method with orthogonal (varimax) and oblique rotations (promax) were performed on the 11 DSSI items. Both rotation methods identified the same two factors. Based on the varimax rotation, 34% of the variance was explained by the first factor and a total of 48% of variance was explained by both factors (oblique rotation data not shown). The last item, 'How satisfied are you with the kinds of relationships you have with your family and friends?' was excluded from the final factor analyses as it did not load on either factor and had low communality (0.01). The first factor related to satisfaction with social support and included six items. The second factor consisted of four items relating to social interaction. The communalities for the first two factors ranged from 0.4 to 0.6 (Table 2), demonstrating that the shared variance between individual items and all the other items was reasonable.

**Table 1 Factor loadings, cumulative percentage of variation explained, internal reliability among the Older cohort (n = 12 939)**

| | Item | Percent in highest response category | Loading Factor1 | Loading Factor2 |
|---|---|---|---|---|
| | ***Satisfaction with social support*** | | | |
| 9 | Definite role among your family and friends | 86.3 | **0.77** | 0.13 |
| 5 | Family and friends understand you | 88.3 | **0.72** | 0.07 |
| 6 | Feel useful to your family and friends | 83.2 | **0.70** | 0.10 |
| 8 | Feel you are being listened to | 83.1 | **0.69** | 0.05 |
| 7 | Know what is going on with your family and friends | 75.7 | **0.69** | 0.08 |
| 10 | Can you talk about your deepest problems | 76.4 | **0.64** | 0.17 |
| | ***Social interaction*** | | | |
| 2 | Number of visits in the last week | 55.0 | 0.09 | **0.76** |
| 1 | Number of people you feel you can depend on | 58.9 | 0.22 | **0.66** |
| 3 | Number of telephone calls in the past week | 42.3 | 0.14 | **0.61** |
| 4 | Number of meetings or groups in the past week. | 2.2 | -0.03 | **0.59** |
| | ***Excluded item*** | | | |
| 11 | Satisfaction with the kinds of relationships you have. | 81.6 | | |

**Derived Variables**

*Scores*
Summed scores were obtained by adding the response scores for the items that loaded together for each of the factors. Factor scores were calculated as the weighted sum of scores for all items; weights were the scoring coefficients from the factor analysis with varimax rotation.

Correlations between the factor scores and summed scores were high for ‘satisfaction’ (0.89) and ‘interaction’ (0.98). Hence, summed scores were used in the remaining analyses.

*Missing items*
Mean imputation was used to replace up to two missing items in the 10-item DSSI; no missing items were imputed in the two sub-scales.

**Table 2 Scoring coefficient and communalities from factor analysis of 10 DSSI Items among 12 939 women from the Older cohort**

| | Item | Scoring Coefficients | Communality |
|---|---|---|---|
| | ***Satisfaction with social support*** | | |
| 9 | Definite role among your family and friends | 0.26 | 0.61 |
| 5 | Family and friends understand you | 0.25 | 0.53 |
| 6 | Feel useful to your family and friends | 0.24 | 0.50 |
| 8 | Feel you are being listened to | 0.24 | 0.47 |
| 7 | Know what is going on with your family and friends | 0.24 | 0.48 |
| 10 | Can you talk about your deepest problems | 0.21 | 0.44 |
| | ***Social interaction*** | | |
| 2 | Number of visits in the last week | 0.45 | 0.58 |
| 1 | Number of people you feel you can depend on | 0.37 | 0.48 |
| 3 | Number of telephone calls in the past week | 0.35 | 0.39 |
| 4 | Number of meetings or groups in the past week. | 0.37 | 0.35 |

*Construct validity*

Summed scores for the sub-scales and the overall DSSI were compared with variables thought to be related to DSSI. Positive correlations were hypothesised with PCS, MCS, the eight sub-scales of the SF-36, and life satisfaction, a negative correlation with mean stress, and no association with body mass index. Differences in mean DSSI scores for different socio-demographic and health related groups were estimated, taking the over-sampling in rural and remote areas into account, using the least squares mean option in the general linear model procedure in SAS. The level of significance was set to 0.005 to reduce the effects of multiple comparisons and the large sample size.

The construct validity of the 10-item DSSI and the 'satisfaction' and 'interaction' sub-scales was supported by significant correlations between the DSSI and its sub-scales, 'satisfaction' and 'interaction', and stress, life satisfaction, physical and mental health (Table 3, all p-values <0.0001 except for BMI where all p-values were >0.05).

Women with higher social support tended to be Australian born, be widowed or married, have more education and found it easier to manage on their available income (Table 4; p<0.0001 for all differences).

**Table 3 Correlations between social support summed scores and factors hypothesised to be associated with social support (n = 12 939)**

| | DSSI (10 items) | Support (6 items) | Interaction (4 items) |
|---|---|---|---|
| **SF-36 Physical Health Component Score** | 0.14 | 0.13 | 0.10 |
| Physical functioning | 0.20 | 0.17 | 0.14 |
| Role limitations due to physical health | 0.18 | 0.18 | 0.11 |
| Bodily pain | 0.16 | 0.16 | 0.09 |
| General health | 0.25 | 0.23 | 0.17 |
| **SF-36 Mental Health Component Score** | 0.34 | 0.33 | 0.22 |
| Vitality | 0.28 | 0.27 | 0.18 |
| Social functioning | 0.28 | 0.26 | 0.18 |
| Role limitations due to emotional health | 0.23 | 0.23 | 0.14 |
| Mental health | 0.37 | 0.35 | 0.24 |
| Mean stress score | -0.30 | -0.33 | -0.14 |
| Life satisfaction score | 0.42 | 0.40 | 0.27 |
| Body mass index (BMI) | 0.01 | -0.0004 | 0.02 |

**Table 4 Socio-demographic characteristics significantly associated with 10-item Duke Social Support Index mean and 95% confidence interval (CI)**

| | Number | Mean | (95% CI) |
|---|---|---|---|
| Country of birth | | | |
| Australian born | 9 222 | 28.4 | (28.3; 28.5) |
| Other English speaking background | 1 515 | 28.1 | (27.9; 28.2) |
| Non-English speaking background | 1 227 | 27.2 | (27.0; 27.3) |
| Area of residence | | | |
| Non-urban | 7 438 | 28.4 | (28.3; 28.5) |
| Urban | 5 062 | 28.1 | (28.1; 28.2) |
| Marital status | | | |
| Widowed | 4 311 | 28.3 | (28.2; 28.4) |
| Married/defacto | 7 109 | 28.2 | (28.1; 28.3) |
| Never married | 347 | 27.8 | (27.5; 28.1) |
| Separated/ divorced | 707 | 27.6 | (27.4; 27.8) |
| Highest qualification completed | | | |
| Post-school | 1 778 | 28.4 | (28.3; 28.6) |
| School | 6 133 | 28.4 | (28.3; 28.5) |
| No formal | 4 184 | 27.8 | (27.7; 27.9) |

| | Number | Mean | (95% CI) |
|---|---|---|---|
| Manage on income available | | | |
| Easy | 2 731 | 28.7 | (28.6; 28.8) |
| Not to bad | 6 302 | 28.4 | (28.3; 28.4) |
| Difficult some of the time | 2 467 | 27.7 | (27.6; 27.8) |
| Difficult all of the time/ impossible | 865 | 26.9 | (26.7; 27.1) |

Analyses were weighted to account for over-sampling in rural and remote areas.

In terms of health, they rated their general health more highly, had fewer chronic conditions and symptoms, took fewer medicines, did not need help with daily tasks and had fewer visits to GPs (Table 5; $p<0.0001$ for all differences except 'need help', $p=0.0009$). Social support was positively correlated with satisfaction with GP (0.21). Women had higher social support if, in the last year, they had no major illness or injury, there had been no major decline in health, or death, of their spouse and no major conflict with their children (Table 6; $p<0.0001$ for all differences except 'death of spouse', $p=0.0009$).

*Recommendation for usage*

The 10-item DSSI, the 6-item satisfaction with social support sub-scale and the 4-item social interaction sub-scale are all appropriately used in statistical analyses as continuous measures.

**Table 5 Health related characteristics significantly associated with 10-item Duke Social Support Index mean and 95% confidence interval (CI)**

| | Number | Mean | (95% CI) |
|---|---|---|---|
| Self-rated health | | | |
| Excellent | 770 | 29.0 | (28.7; 29.2) |
| Very good | 3 213 | 28.9 | (28.8; 29.0) |
| Good | 4 797 | 28.3 | (28.2; 28.4) |
| Fair | 2 910 | 27.4 | (27.3; 27.5) |
| Poor | 507 | 26.0 | (25.8; 26.3) |
| Number of chronic conditions ever diagnosed | | | |
| 0 to 2 | 9 697 | 28.3 | (28.2; 28.4) |
| 3 to 10 | 2 680 | 27.9 | (27.8; 28.0) |
| Number of symptoms in the last year | | | |
| 0 to 2 | 2 455 | 28.9 | (28.7; 29.0) |
| 3 to 6 | 4 501 | 28.5 | (28.5; 28.6) |
| 7 to 21 | 4 872 | 27.6 | (27.5; 27.7) |
| Regularly need help with daily tasks | | | |
| No | 10 672 | 28.4 | (28.3; 28.4) |
| Yes | 1 014 | 26.7 | (26.5; 26.9) |
| Number of GP visits in the last year | | | |
| Less than five | 5 789 | 28.4 | (28.3; 28.5) |
| Five or more | 6 549 | 28.0 | (28.0; 28.1) |
| Number of prescribed medicines , last 4 weeks | | | |
| Less than four | 9 030 | 28.3 | (28.3; 28.4) |
| Four or more | 3 463 | 27.8 | (27.7; 27.9) |
| Medication for nerves in past 4 weeks | | | |
| No | 10 996 | 28.4 | (28.3; 28.4) |
| Yes | 1 410 | 27.0 | (26.9; 27.2) |
| Medication for sleep in past 4 weeks | | | |
| No | 10 229 | 28.3 | (28.3; 28.4) |
| Yes | 2 154 | 27.6 | (27.5; 27.7) |

Analyses were weighted to account for over-sampling in rural and remote areas.

**Table 6 Life events in last year significantly associated with 10-item Duke Social Support Index mean and 95% confidence interval (CI)**

| | Number | Mean | (95% CI) |
|---|---|---|---|
| Major personal illness | | | |
| No | 10 534 | 28.3 | (28.2; 28.3) |
| Yes | 1 744 | 27.5 | (27.4; 27.6) |
| Major personal injury | | | |
| No | 11 798 | 28.2 | (28.2; 28.3) |
| Yes | 482 | 27.6 | (27.4; 27.9) |
| Major decline in health of spouse | | | |
| No | 9 602 | 28.3 | (28.3; 28.4) |
| Yes | 2 269 | 27.9 | (27.8; 28.0) |
| Death of spouse | | | |
| No | 11 764 | 28.2 | (28.2; 28.3) |
| Yes | 573 | 27.8 | (27.5; 28.0) |
| Major conflict with children | | | |
| No | 11 831 | 28.3 | (28.3; 28.4) |
| Yes | 536 | 25.7 | (25.5; 26.0) |

Analyses were weighted to account for over-sampling in rural and remote areas.

The SAS code defining the DSSI and subscales is:

```
/* duplicate DSSI items */;
dssi1 = o1q61 ;     dssi2 = o1q62 ;     dssi3 = o1q63 ;
dssi4 = o1q64 ;     dssi5 = o1q65a ;    dssi6 = o1q65b ;
dssi7 = o1q65c ;    dssi8 = o1q65d;     dssi9 = o1q65e;     dssi10 = o1q65f;

/** Recode DSSI 2,3,4 **/;
dssi2r = . ;
if 3<=dssi2<=7 then dssi2r=3 ;
else if 1<=dssi2<=2 then dssi2r=2 ;
else if dssi2=0 then dssi2=1 ;
dssi3r = . ;
if 0<=dssi3<=1 then dssi3r=1 ;
else if 2<=dssi3<=5 then dssi3r=2 ;
else if 6<=dssi3<=7 then dssi3r=3 ;
dssi4r = . ;
if 0<=dssi4<=1 then dssi4r=1 ;
else if 2<=dssi4<=5 then dssi4r=2 ;
else if 6<=dssi4<=7 then dssi4r=3 ;

array socint{4} dssi2r dssi3r dssi4r dssi1 ;
array satsup{6} dssi5 dssi6 dssi7 dssi8 dssi9 dssi10 ;
array dssi{10} dssi2r dssi3r dssi4r dssi1 dssi5 dssi6 dssi7 dssi8 dssi9
dssi10 ;

/** Calculate 2 sub-scales of the DSSI - no missing items
    - social interaction (DSSIsoci) 4 items
    - satisfaction with support (DSSIsupt)6 items **/;
if nmiss(of socint{*}) = 0 then DSSIsoci = sum(of socint{*}) ;
else DSSIsoci = . ;

if nmiss(of satsup{*}) = 0 then DSSIsupt = sum(of satsup{*}) ;
else DSSIsupt = . ;

/** Calculate DSSI for 10 items **/;
sumdssi = sum(of dssi {*}) ;
meandssi = mean(of dssi {*}) ;
missdssi = nmiss(of dssi {*}) ;
if 0<=missdssi<=2 then DSSI = sumdssi + (missdssi * meandssi) ;
else if 3<=missdssi<=10 then DSSI = . ;

DSSIsoci = o1DSSIsoci ;    DSSIsupt = o1DSSIsupt ;    DSSI = o1DSSI ;
```

**References**


1. Litwin H. Social network type and morale in old age. *Gerontologist* 2001;41:516-524
2. Gibson DM. *Aged Care: Old policies new problems*. Melbourne: Cambridge University Press; 1998
3. Simonsick EM, Kasper JD, Phillips CL. Physical disability and social interaction: factors associated with low social contact and home confinement in disabled older women (The Women's Health and Aging Study). *Journals of Gerontology. Series B, Psychological Sciences and Social Sciences* 1998;53:S209-17
4. Penninx BW, van Tilburg T, Kriegsman DM, Deeg DJ, Boeke AJ, van Eijk JT. Effects of social support and personal coping resources on mortality in older age: the Longitudinal Aging Study Amsterdam. *American Journal of Epidemiology* 1997;146:510-9
5. Seeman TE, Berkman LF, Charpentier PA, Blazer DG, Albert MS, Tinetti ME. Behavioral and psychosocial predictors of physical performance: MacArthur studies of successful aging. *Journal of Gerontology* 1995; 50A:M177-183
6. Bowling A. Social support and social networks: their relationship to the successful and unsuccessful survival of elderly people in the community. An analysis of concepts and a review of the evidence. *Family Practice* 1991;8:68-83
7. Steinbach U. Social networks, institutionalization and mortality among elderly people in the United States. *Journal of Gerontology* 1992;47:S183-190
8. Goodger B. An examination of social support amongst older Australians. *Thesis* submitted for the degree of Doctor of Philosophy, University of Newcastle, 2000
9. Koenig HG, Weslund RE, George LK, Hughes DC, Blazer DG, Hybels C. Abbreviating the Duke Social Support Index for use in chronically ill elderly individuals. *Psychosomatics* 1993;34:61-69
10. Goodger B, Byles J, Higginbotham N, Mishra G. Assessment of a short scale to measure social support among older people. *Australian and New Zealand Journal of Public Health* 1999;23:260-265