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Groningen Orthopaedic Social Support Scale: validity and reliability

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Groningen Orthopaedic Social Support Scale: validity and reliability

Background. Social support is an important factor in the rehabilitation process, as it has a positive influence on patients' health, functioning and recovery. In particular, perceived social support and instrumental support are important after total hip or knee arthroplasty. However, nursing staff often appear to estimate the amount of support available to patients by number of visitors. Until now, no suitable Dutch-language scale was available to measure social support in orthopaedic patients.

Aim. The aim of this paper is to describe the development and initial validity and reliability testing of the Groningen Orthopaedic Social Support Scale, a self-report questionnaire to measure social support in patients after total hip or knee arthroplasty.

Methods. A total of 119 people who had had arthroplasty completed the Groningen Orthopaedic Social Support Scale and a control scale. The reliability and validity of the questionnaire were analysed.

Results. Reliability of the Groningen Orthopaedic Social Support Scale can be considered satisfactory, with a Cronbach's alpha of 0.89. Analysis of construct validity by means of factor analysis yielded two factors: perceived social support and instrumental support. A Pearson's correlation between these subscales was moderate ($r = 0.61$ and statistically significant). Concurrent validity can be considered satisfactory, with a Pearson correlation of 0.72 ($P < 0.001$) between the Groningen Orthopaedic Social Support Scale and the control list.

Conclusions. The Groningen Orthopaedic Social Support Scale can be considered suitable for measuring social support. It can be used to help nursing staff determine if a patient's need for social support is fulfilled, and to advise family and friends on the basis of the results. The questionnaire can also be used to establish the role of social support as a factor in supportive interventions during and after hospital stay.

Keywords: Groningen Orthopaedic Social Support Scale, reliability, validity, nursing, total hip arthroplasty, total knee arthroplasty

Introduction

Social support is an important factor during rehabilitation, as it influences patients' health and functioning. Surgery, in the form of total hip arthroplasty (THA) and total knee arthroplasty (TKA), magnifies the need for social support. Since THA and TKA patients are mainly older adults, the role of social support may be even more important (Young *et al.* 1990, Goodger *et al.* 1999). Hupcey (2001) found that when the need for social support is fulfilled, patients are less critical of health care staff and services. A study by Wortman and Conway (1985) concluded that the impact of social support on postsurgical recovery is impressive, as patients who received supportive interventions averaged hospital stays that were 2 days shorter than those of control respondents. Hence, social support is a relevant influence in postsurgical rehabilitation. Assessing patients' needs for social support during hospital stay is therefore relevant task for nursing staff (Hupcey 2001).

In the Netherlands, as well as in other Western countries, medical, economic and social developments have resulted in an increasing number of THAs and TKAs being performed each year. An ensuing shortening of hospital stays following such operations has been seen in the last decade (Okhuijsen *et al.* 1998, Healy *et al.* 2002, Ostendorf *et al.* 2002). Consequently, the focus on rehabilitation had shifted from the hospital to the home situation, where social support has to be provided by family and friends. Next to assessing a patient's needs for social support during hospital stay, this creates an additional task for nursing staff: advising the patient's family and friends on these needs (Hupcey 2001).

Hupcey (2001) concludes that, in general, nursing staff appear to estimate the amount of support given to patients by number of visitors. However, previous research indicates that the quality of social support is more important than the quantity (Broadhead *et al.* 1988, Hupcey 2001). An instrument is therefore needed that can help nursing staff measure social support in patients rehabilitating after THA or TKA. Until now, no suitable Dutch-language scale was available for this purpose.

Social support

No consensus on the definition of social support exists in the literature. In general, social support is seen as a multidimensional construct, but the number and definition of dimensions are described differently by various authors. A distinction is often made between four major dimensions: social network, social interaction, perceived or subjective support, and instrumental support (Koenig *et al.* 1993).

Social network is defined as 'those persons one particular person has any sort of contact with, or those for whom the relationship is based on culturally-determined expectations, obligations and rights' (Van Sonderen 1991). In this respect, a small pool of intimates is considered more important than a broad social network in terms of providing support. Contact between members of the network takes place through social interactions, which can be supportive or non-supportive, depending on the context and on whether the receiver considers them supportive (George *et al.* 1989). Instrumental support is constituted by the tangible services received from network members (George *et al.* 1989). It is an objective measure of social support, denoting the presence or absence of various kinds of material assistance. A central point in perceived social support is a person's perception of their inclusion as a valued and useful member of a social network, whether the network would provide help and support if needed, and general satisfaction with the amount and quality of social support available (George *et al.* 1989). Procidano and Heller (1983) define perceived social support as 'the extent to which an individual believes that his or her need for support, information and feedback are fulfilled'. Perceiving certain interactions as being supportive is based on subjective definition of the situation (in terms of 'needs'), as well as on expectations for that situation based on availability of support and previous experiences of support received (Doeglas *et al.* 1996).

A large amount of research has already been done into the relationship between social support and health. Two main theories about the impact of social support on the relationship between stress and health status are distinguished in the literature. First, the *stress buffer* theory proposes that social support acts as a buffer to protect people from the negative influence of stress on health (Sarason *et al.* 1983, Kriegsman *et al.* 1997). The impact of disease can be encountered as potential stressor. Second, the *direct effect* hypothesis states that an optimal amount of social support has a beneficial effect on health, regardless of whether or not stress is present (Kriegsman *et al.* 1997). These hypotheses need not be mutually exclusive. Although social support may be directly helpful in all circumstances, it may be particularly effective as a buffer during times of stress (Zimet *et al.* 1988, Penninx 1996).

The subjective dimension of social support is identified as the most important one promoting health and buffering stress (Rosenstiel & Keefe 1983, House & Kahn 1985, Keefe *et al.* 1992). Research indicates that perceived social support has a more positive influence on health than social network and social interaction (Keefe *et al.* 1992, Callaghan & Morrissey 1993, Dracub 1994). Research by Arling (1987) showed that

social network size, measured by number of self-reported confidants and people to call upon for help, had no significant effect on distress. Moreover, perceived quality rather than quantity of support is associated with a buffering effect on the impact of disease on physical functioning (Mutran *et al.* 1995, Kriegsman *et al.* 1997). It is not the mere presence but the positive perception of family support which has a beneficial influence on physical and mental recovery from disease (Kriegsman *et al.* 1995, Mutran *et al.* 1995, Kitamura *et al.* 2002). Perceived social support is therefore an important influence in the rehabilitation process (Wortman & Conway 1985).

Instrumental support has particular relevance for older individuals with non-psychiatric medical conditions (e.g. THA and TKA) that may compromise their ability to care for themselves, thus increasing the need for such support. Availability of instrumental support may also be especially useful in predicting institutionalization of functionally impaired elders (Koenig *et al.* 1993). Therefore, in a functionally disabled group, instrumental support is also a relevant dimension of social support in the rehabilitation process.

The study

Aim

The aim of the study was to develop and test the reliability and validity of a self-report questionnaire – the Groningen Orthopaedic Social Support Scale (GO-SSS) – to measure social support in patients after total hip or knee arthroplasty.

Participants

A total of 119 patients [39% men ($n = 47$), mean age 62; 61% women ($n = 72$), mean age 64.1] participated in the study. There were 78 THA and 41 TKA patients. Participants had undergone surgery on average 7.8 months before the study.

Instruments

We chose the Duke Social Support Index (DSSI) as basis for the GO-SSS, after translation into Dutch. The 35-item DSSI embodies the notion of social support as a multidimensional construct, as it is based on the four dimensions described (George *et al.* 1989, Landerman *et al.* 1989, Koenig *et al.* 1993). For the development of the GO-SSS we concentrated on two of the four subscales of the DSSI: the 13-item Perceived Social Support subscale and 10-item Instrumental

Support subscale. From these subscales, only those items were used that specifically apply to older people and are relevant for orthopaedic patients after total hip or knee arthroplasty. Questions about children, babysitting and career development, for example, were eliminated. After this selection, four items from the Perceived Social Support subscale and four from the Instrumental Support subscale remained. To these eight items we added four others, which address important issues in the rehabilitation period. Finally, the GO-SSS consisted of 12 questions, divided into two subscales: Perceived Social Support (seven items) and Instrumental Support (five items). On a Likert scale, four responses are possible: (1) never or rarely, (2) now and then, (3) regularly and (4) often.

In order to determine concurrent validity, we used the Social Support List 12-Interactions (SSL12-I) as a control (Kempen & Van Eijk 1995). The SSL12-I is an abbreviated version of the SSL-I by Van Sonderen (1993) and consists of 12 questions. The SSL12-I is divided into three subscales: everyday social support (four items referring to social companionship and daily emotional support), support in problem situations (four items referring to instrumental support, informative support, and emotional support in times of trouble), and esteem support (four items referring to support resulting in self-esteem and approval). Four responses on a Likert scale are possible, and are the same as for the GO-SSS. The SSL12-I has satisfactory reliability and validity and was developed to measure social support in older people (Van Eijk *et al.* 1994).

Data collection

In February 2002, the GO-SSS and the SSL12-I were sent to 166 people who had undergone a TKA or THA, 1–14 months previously. Participants were asked to fill in the questionnaires and return them within 2 weeks. After 2 weeks, 116 (70%) returned the questionnaire. A phone call was made to non-respondents, and eventually, 119 people filled in the questionnaire, giving a response rate of 72%.

Ethical considerations

The study was carried out in accordance with the regulations of the Medical Ethical Board of Groningen University Hospital. With the questionnaire, participants received a letter explaining the aim of the study. Additionally, confidentiality was assured. Return of the completed questionnaire was taken as consent to participate.

Data analysis

Statistical analyses were executed using SPSS 10.0 (SPSS Inc., Chicago, IL, USA). To determine reliability, Cronbach's coefficient alpha was used as a measure of internal consistency. To determine construct validity, factor analysis was used and Pearson's correlation coefficient was calculated between the two subscales of the questionnaire. To determine concurrent validity, Pearson's correlation coefficients were calculated between the GO-SSS and its subscales and the SSL12-I as control.

Results

Reliability

Internal consistency

Cronbach's alpha was 0.89 for the entire questionnaire, and internal consistency was calculated for the two subscales separately. It was 0.86 for the Perceived Social Support subscale and 0.83 for the Instrumental Support subscale.

Validity

Construct validity

A factor analysis was carried out and Pearson's correlation coefficient for the sum scores of the two subscales was calculated. Principal component factor analysis with varimax rotation yielded two factors, each with an eigenvalue greater than 1. The percentage of explained variance for the first factor was 48.3% (eigenvalue 5.8), and for the second 12.1% (eigenvalue 1.5). Total amount of explained variance for

these two factors was 60.4%. The items of each of the two subscales loaded on two separate factors (see Table 1). Correlation between the sum scores of the two subscales was calculated to obtain additional information about the instrument's construct validity. Pearson's correlation between the two subscales was 0.61 and significant ($P < 0.001$).

Concurrent validity

Concurrent validity was assessed by comparing the sum scores of the GO-SSS and its subscales with the sum score of the SSL12-I. Pearson correlation between the GO-SSS and the SSL12-I was 0.72, 0.77 between the Perceived Social Support subscale and the SSL12-I, and 0.51 between the Instrumental Support subscale and the SSL12-I. All correlations were significant ($P < 0.001$).

Discussion

Social support is an important factor in the rehabilitation process. Therefore, a relevant task for nursing staff is to assess patients' need for social support and to advise family and friends accordingly. Our study of the reliability and validity of the GO-SSS was performed 14 months after hospitalization. The results show that for that period the questionnaire appears to be a reliable and valid measure of social support in arthroplasty patients. In addition, the questionnaire is currently being used in an intervention called the Groningen Orthopaedic Exit Strategy (GOES) (Stevens *et al.* 2004). In this intervention, patients fill in the GO-SSS on the first day of hospitalization. The first analysis indicates that the questionnaire is also reliable and valid for that period. The data show that the questionnaire has good

Items	Perceived social support	Instrumental support
1. My friends and family understand me	0.598	0.090
2. My friends and family help me with my exercises	0.270	0.593
3. My friends and family provide meals for me	0.149	0.820
4. I do feel listened to by my friends and family	0.779	0.374
5. My friends and family are there for me when I am sick	0.714	0.486
6. I can talk with my friends and family about my deepest problems	0.834	0.045
7. My friends and family do my shopping	0.202	0.884
8. My friends and family are there for me when I need them	0.496	0.448
9. My friends and family provide transportation for me	0.124	0.713
10. I can share happiness and sorrow with my friends and family	0.769	0.282
11. My friends and family help me to do household chores	0.393	0.659
12. My friends and family are prepared to help me with making decisions	0.667	0.283

A bold figure indicates the highest loading and therefore the factor to which the item belongs.

Table 1 Results of factor analysis of the Groningen Orthopaedic Social Support Scale – varimax rotation

What is already known about this topic

- Social support is an important determinant in the rehabilitation process and, when the quality of social support fulfils the needs of the patient, there is a positive effect on health, functioning and postoperative recovery.
- Social support is a multidimensional construct, but perceived social support is most relevant to the rehabilitation process.
- Nursing staff often appear to estimate the amount of support given to patients by number of visitors and not by the perceived quality of social support provided.

What this paper adds

- Evidence of the reliability and validity of a newly-developed Dutch questionnaire measuring social support for patients following arthroplasty.
- A means for social support to be assessed by nursing staff, in order to advise family and friends.
- A means of determining the role of social support in interventions for patients during and after hospital stay.

reliability (α 0.91) and the factor analysis gives the same factor structure (Murriss *et al.* 2003). It can therefore be concluded that the GO-SSS is a reliable and valid questionnaire to measure social support in THA and TKA patients during and after hospital stay.

Reliability was assessed on the basis of internal consistency of the GO-SSS and its subscales. The consistency (α) was satisfactory, at 0.83, 0.86, and 0.89. All results easily met the minimum criterion of 0.70 set by Nunnally and Bernstein (1994). Test-retest reliability was not measured in this study, because social support is considered to be a dynamic construct and subject to many different influences. Especially in patients undergoing rehabilitation, the need for (instrumental) social support, and consequently the perception of social support, can fluctuate. Test-retest results may reflect changes in the need for social support rather than being an indication of the stability of the questionnaire (Stevens *et al.* 2000).

Validity was assessed on the basis of construct- and concurrent-related validity. Construct validity was calculated by means of factor analysis with varimax rotation and correlation between the subscales. Factor analysis resulted in two factors, confirming that the GO-SSS reflects two different dimensions of social support: perceived and instrumental. Only item 8, 'My friends and family are there for me when I need them', had a loading on the factor Perceived Social

Support that was not much higher than its loading on the factor Instrumental Support (0.496 vs. 0.448). A probable explanation is the fact that the item has both dimensions incorporated. When friends and family are present, they can provide social as well as instrumental support. However, as the item is about a person's perception and not the actual transaction of support, and as the factor-loading on the Perceived Social Support subscale was a little higher, item 8 belongs to this dimension. Pearson's correlation between the subscales was moderate ($r = 0.61$) and significant, from which it can be concluded that two different dimensions of social support are being measured.

Concurrent validity was assessed by comparing the sum scores of the GO-SSS and its subscales with the sum score of the SSL12-I. With respect to concurrent validity, there is no general accepted criterion for the height of the correlation available. The correlation coefficient is influenced by the extent to which the two lists measure the same construct (Sallis *et al.* 1987, Lemmink 1996). As the SSL12-I has only one question about instrumental support, there is a certain discrepancy between the two lists. The correlation between the Instrumental Support subscale and the SSL12-I is therefore expected to be low. The strongest correlation is expected to be between the Perceived Social Support subscale and the SSL12-I. The correlation for the sum scores of the GO-SSS and the SSL12-I was 0.72, 0.77 for the Perceived Social Support subscale and the SSL12-I, and 0.51 for the Instrumental Support subscale and SSL12-I, all significant at a $P < 0.001$ level. These results can be considered satisfactory and confirm our expectations.

Conclusion

We therefore conclude that the GO-SSS can be used to measure social support in THA and TKA patients. It can help nursing staff determine if patients' need for social support is fulfilled. Especially considering the ongoing trend of reducing hospital stays, it is relevant for nursing staff is to assess patients' need for social support and to advise family and friends who provide such support in the home situation. The questionnaire can also be used to determine the role of social support as a determinant in supportive interventions during and after hospital stay. Further research into these kinds of interventions can also reveal additional information about the responsiveness of the GO-SSS.

Author contributions

All authors have contributed directly to this study and this paper. IAS, MS and JRH contributed to the study conception

and design. IAS and AS were responsible for the data collection and IAS and MS contributed to the data analysis. IAS, MS and JRH provided statistical expertise for this study. IAS and MS drafted the paper and all authors carried out critical revisions of the paper. Supervision was provided by MS, AS and JRH.

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