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Effect of applying nursing care guide on health related quality of life for patients undergoing spinal fusion surgery

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Abstract
Aims of the study: *To evaluate the effect of applying a nursing care guide on the outcomes of patients undergoing spinal fusion surgery.*
Research hypothesis: *Health related quality of life of the study group patients will be better than the control group patients.*
Research design: *Prospective randomized case-control study.*
Setting: *orthopedic surgery department and outpatient spine clinic at Assiut University Hospital.*
Sample: *a sample of sixty adult male (31.6%) and female (68.4%) patients underwent spinal fusion surgery.*
Tool: *36-Item Short Form Health Survey Instrument.*
Analysis of the results: *Health related quality of life showed significant improvement in both the study and control groups during the follow up period (3 months post-surgery) and there was a statistically significant difference between both groups regarding; physical function (p=0.003), role limitation due to physical function (p=0.002), vitality (p=0.001), social function (p=0.001) and general health (p=0.001).*
Conclusion and recommendation: *The present study revealed that providing patients with a guide detailed with instructions for improving their quality of life was of great value and actually improved their life. The present study should be replicated on larger study populations for generalization of the results, providing copies of the nursing guide in the orthopedic department and spine clinic to be readily available for all patients planned to undergo spinal fusion surgeries.*
Key words*; health related quality of life, nursing care guide, spinal fusion surgery*

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I. Introduction:

For those patients suffering from chronic and severe back pain, lumbar spinal fusion (LSF) surgery is a commonly used treatment strategy when conservative treatment has failed [1]. Spinal fusion rates increased significantly in the past two decades in the western countries, especially in the United States. Lumbar spinal fusion procedures increased with 220% in the period 1990 – 2000 [2] and another 170% in the period 1998–2008 [3].

Lumbar fusion surgery (LFS) is performed to rigidly stabilize vertebral motion segments, which is commonly performed simultaneously with decompression of the affected neural tissue, to relieve back and/or neurogenic leg pain [4–5].

The use of patient-reported outcomes (PROs) in evaluating fusion surgery outcome was used over the last few decades beside physical examinations, imaging or clinical outcome scales. Nowadays, the routine use of certain instruments in conjunction with low back pain and surgical treatment has been recommended [6,7]. Condition-specific disability measures as the Oswestry Disability Index (ODI) should be used before and after surgical interventions. When evaluating surgical outcomes in the clinical-research setting, Health Related Quality of Life (HRQoL) tools, such as the Short-Form 36 (SF-36), Short Form 12 (SF-12) or European Quality of life Group (EQ-5D) should be used [6].

In 2004 in the United States over 500,000 lumbar spinal surgeries were performed for lumbar herniated disks and lumbar spinal stenosis [8]. Numerous studies have been conducted on the clinical outcomes of spinal surgery. Improved health-related quality of life (HRQOL) and pain relief are both patient expectations following lumbar spinal surgery, there is limited research regarding this experience from the individual's perspective, so this study targeted those patients who underwent spinal fusion surgery for measuring their health related quality of life. Success of surgery which will increase patient's level of functioning and improves patient's quality of life largely depends on effective patient education at discharge [9].

Aims of the study: To determine the effect of applying a nursing care guide on health related quality of life for patients undergoing spinal fusion surgery.

Research hypothesis:
Health related quality of life of the study group patients will be better than the control group patients.

II. Patients and methods

Research design: Prospective randomized case-control study

Setting: orthopedic surgery department, and outpatient spine clinic at Assiut University Hospital.

Sample: a sample of sixty adult patients undergoing spinal fusion surgery, their age ranges from 18 to 65 years. The sample size was calculated using the epi info sample size calculation system "G power program 3.1.3 was used to calculate sample size in order to detect a significant difference in mean of SF-36 between two groups under the study, hypothized effect size 0.7. power 80 %" allocation ratio 1:1, 28 patients were included in each group with total sample size of 54 an increase of 2 patients in each group was done considering any drop out of patients or non-compliance with the follow up or the application of the guidelines and final estimation of the results was done on 60 compliant patients, 30 in each group.

Exclusion criteria included; cancer patients, cauda equina syndrome, patients with spinal cord injury and those having more than two levels of fusion. This sample was divided randomly into two equal groups (30 patients for each), the **randomization process** was as follows; each odd number case was included as a control subject and each even number case was a study subject:

1. The control group received the routine hospital care "resident oral instructions".
2. The study group with whom the nursing care guide was applied and the effect of these guidelines was measured.

Both groups (the study and the control one) were assessed twice; preoperatively and 3 months post operatively using the 36-item short form health survey instrument.

Tool: one tool was used in this study:
Tool: 36-Item Short Form Health Survey Instrument (Saud et al., 1995): which was used to assess patient's health related quality of life. It included two parts; first data regarding patient's demographic variables and medical diagnosis, the second concerning health survey domains.

The nursing care guide for patients undergoing spinal fusion surgery; this guide was prepared in simple Arabic language and illustrated photos also patients included in the study group were shown a video demonstration on the guide included exercises, and were given a copy to take home, the booklet included the following; simple explanation on the spinal fusion surgery and advantage of performing the surgery, patient expectation during the surgery, preoperative preparation, breathing exercises, use of the spirometer, postoperative instructions on "showering, wound care, toileting, physiotherapy, activities of daily livings, how to get in and out of bed or change position in bed, sitting /standing, carrying objects, walking, getting upstairs, getting in and out of the car, driving, getting back to work, prevention of complications, postoperative medications needed as analgesics and laxatives, warning signs and symptoms necessitating surgeon contact as increased redness and edema, wound separation, fever, ecchymosis, increased pain unrelieved by analgesics or offensive wound discharge and finally the postoperative exercises needed. This guide was revised by a jury of five experts for clarity, easiness and relevance (2 orthopedic surgeons, two medical-surgical nursing faculty staff and one physiotherapist), after making the necessary modifications; the booklet and tool was pilot tested on 6 patients to ensure easiness and clarity for understanding.

Procedure:

I- Preparatory phase:

The researcher first conducted the assessment process for the number of cases admitted in the orthopedic department who were scheduled for spinal fusion surgery. An approval from faculty of nursing – ethics committee was obtained. A hospital permission from the head of orthopedic department and out-patient spine clinic to collect the necessary data was also taken after the aim and study nature were explained. A literature review was done to prepare the study tool and patient guide from library and internet sources. A pilot study was conducted during May 2016. It included 6 patients, in order to test clarity and applicability of the study tool; no changes were done in the tool, so that patients of the pilot study were included in the main study.

II- Implementation phase:

Patients were randomly assigned into two groups (study / control group) with each consisting of 30 patients. Patients were interviewed individually for filling out the study tools on admission. Patients in the study group were met for three sessions; **one preoperatively** for training on the basic postoperative care (deep breathing and coughing exercises) and the other two sessions were conducted postoperatively. **The second post-operative session** involved explanation on the activities of daily living as sitting, standing, sex life, showering, toileting and wound care, walking upstairs, getting in and out of the car, carrying objects and driving. While **the third postoperative** session included demonstration of the allowed exercises; ambulation progression as tolerated with the use of assistive device as needed, nerve and supine hamstring stretch, seated hamstring stretch, prone knee flexion, pelvic tilt, hook lying march, bridging, upper body extension, prone hip extension, and bilateral scapular retraction. Each session ranged from 30 to 45 minutes.

Evaluation phase:

Patients from both groups were interviewed individually for assessment in the out-patient spine clinic using the pre-mentioned study tool 3 months after the operation.

Methods:

1. Administrative approval:

Official approval and administration permission were obtained from the head of orthopedic surgery department and outpatient spine clinic.

2. Ethical considerations:

The study was approved by the faculty ethics committee; a written approval was obtained from the enrolled patients to participate in the study after explaining the nature and purpose of the study. The researcher explained that participation is voluntary and patient's participation status will not affect the care they will receive.

3. Pilot Study:

The study tool pre-tested on 10 % (6) of the patients who were included in the study to examine clarity and feasibility of the used tool, those patients were included in the main study as there was no modification needed in the study tool.

Analysis of the results:

Table (1): reveals that the greatest percent in both the control and study groups were between 31 to 43 years old (55%) in both groups, were female (68.3%), house wives (70%) and regarding diagnosis lytic lithesis represented the highest percent (30 and 40 %) in the control and study group respectively.

Table (2): shows that there was no statistically significant difference between the study and control groups regarding their health related quality of life before application of the nursing guide "preoperatively", and their HRQOL was low.

Health related quality of life showed significant improvement in both the study and control groups during the follow up period (3 months post-surgery) and there was a statistically significant difference between both groups regarding the following domains; physical function, role limitation due to physical function, vitality, social function and general health, table (3).

Table (1): Frequency distribution of the demographic characteristics of the study and control group patients (n = 60).

Variable	Control group		Study group		p. value
	n. (30)	%	n. (30)	%	
Age group:					
- 18-30 years	1	3.3	5	16.7	
- 31-43 years	17	56.7	16	53.3	0.210
- 44-65 years	12	40.0	9	30.0	
Sex:					
- Male	8	26.7	11	36.7	0.290
- Female	22	73.3	19	63.3	
Occupation:					
House wife	23	76.7	19	63.3	
Worker	2	6.7	5	16.7	
Farmer	3	10.0	4	13.3	0.771
Driver	1	3.3	1	3.3	
Not working	1	3.3	1	3.3	
Diagnosis:					
- Lytic lithesis	9	30.0	12	40.0	
- LDP	4	13.3	4	13.3	
- LCS	3	10.0	4	13.3	
- spondylodiscitis	3	10.0	3	10.0	
- CDP	2	6.7	1	3.3	0.591
- Fracture ver.	2	6.7	1	3.3	
- Instability	1	3.3	1	3.3	
- Pott's disease	0	0.0	2	6.7	
- Discitis	1	3.3	0	0.0	

- Spondylosis	2	6.7	0	0.0	
- Osteolytic lesion	1	3.3	0	0.0	
-Degenerative scoliosis	0	0.0	1	3.3	
-Degenerative lithesis	2	6.7	0	0.0	
- Spondylolithesis	0	0.0	1	3.3	

Chi square test (cross tabs) was used for these relations, statistical significance was determined according to; P ≤ 0.05 significant, P ≤ 0.01highely significant, P > 0.05 not significant.

Table (2): Comparison between the study and control group regarding preoperative health related quality of life domains (n = 60).

HRQoL domains	Study group n. (30)	Control group n. (30)	p. value
	Mean ± SD	Mean ± SD	
Physical function	29.27 ± 10.54	32.07 ± 9.27	0.122
Physical role limitation	27.11 ± 6.82	27.43 ± 6.61	0.127
Emotional role limitation	34.63 ± 6.56	35.05 ± 7.50	0.758
Vitality	21.80 ± 10.38	21.53 ± 11.09	0.132
Mental health	27.38 ± 12.49	28.50 ± 12.26	0.847
Social function	28.80 ± 10.28	30.27 ± 6.91	0.377
Pain	24.43 ± 6.73	24.40 ± 6.67	0.524
General health	50.1 ± 6.23	48.69 ± 4.19	0.068

Chi square test (cross tabs) was used for these relations, statistical significance was determined according to; P ≤ 0.05 significant, P ≤ 0.01highely significant, P > 0.05 not significant.

Table (3): Comparison between the study and control group regarding follow-up (2 months) health related quality of life domains (n = 60).

HRQoL domains	Study group n. (30)	Control group n. (30)	p. value
	Mean ± SD	Mean ± SD	
Physical function	77.49 ± 18.23	65.17 ± 16.23	0.003*
Physical role limitation	67.20 ± 13.55	62.35 ± 12.41	0.002*
Emotional role limitation	61.03 ± 42.50	60.07 ± 41.97	0.372
Vitality	70.51 ± 16.30	59.76 ± 12.44	0.001**
Mental health	75.18 ± 14.09	75.21 ± 13.92	0.227
Social function	74.53 ± 13.35	63.34 ± 10.24	0.001**
Pain	83.33 ± 21.87	83.05 ± 20.81	0.772
General health	77.98 ± 9.87	68.98 ± 6.04	0.001**

Chi square test (cross tabs) was used for these relations, statistical significance was determined according to; P ≤ 0.05 significant, P ≤ 0.01highely significant, P > 0.05 not significant.

III. Discussion:

The present study revealed that; regarding sociodemographic characteristics of the studied sample; the majority was females, housewives; their mean ages was 46.17 ± 14 and were having lytic lithesis.

The results of the present study agree with Pekkanen et al., 2013 regarding sex of the participants as they found that 67% of the spinal fusion patients were females, but regarding mean age their results showed that the mean age of females was 63 (SD 12) years.

The current study result showed a significant difference between the study and control group subjects during the follow up period in the following domains; physical function, role limitation due to physical function, vitality, social function and general health and there was no significant difference regarding; role limitation due to emotional health, mental health and level of pain and this in my opinion may be attributed to that all patients already have undergone the surgery which will already have a positive impact on patient quality of life.

This study result comes in somewhat accordance with the results of Karen et al., 2007 who found that there was a statistically significant difference between patients who underwent spinal fusion surgery in all health related quality of life except for the general health and role limitation due to emotional health.

The improvements in patients' health related quality of life in the current study comes in accordance with the research results of Karen et al., 2007 who reported that patients who underwent lumbar spinal surgery demonstrated improvements in HRQOL postoperatively.

Providing patients with a rehabilitation guide on discharge and keeping in touch with patients after discharge had its positive impact on the study group patient outcomes. This also was supported by Nicholas et al., 2016 who stressed the importance of rehabilitation on the outcomes of patients following spinal fusion surgery.

IV. Conclusion and recommendation

The present study revealed that providing patients with a guide detailed with instructions for improving their quality of life was of great value and actually improved health related quality of life for those patients in the study group than those patients in the control group.

From the present study we recommend that; providing copies of the nursing guide in the orthopedic department and clinic to be readily available for all patients planned to undergo spinal fusion surgeries, the present study be replicated on larger study populations for generalization of the results,.

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