

# Shoulder Pain and Disability Among Post Mastectomy Patients

## Schulderschmerzen und Funktionseinschränkungen bei Patientinnen nach Mastektomie

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### Key words

Cancer, disability, mastectomy, pain, physical therapy, shoulder

### Schlüsselwörter

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### ABSTRACT

**Purpose** The purpose of this study was to determine shoulder pain and disability among post mastectomy patients.

**Methods** This cross sectional study was conducted in Peshawar Pakistan from June 2017 to June 2018. A self administered questionnaire was used to collect demographic information and clinical characteristics while Shoulder Pain and Disability Index (SPADI) was used to evaluate shoulder pain and disability. Female post mastectomy patients with age between 18 to 55 years were included. Patients with co-morbidities, bilateral mastectomy, history of trauma, history of shoulder pain before mastectomy and shoulder pain on non-operated side were excluded. SPSS version 23 was used to analyze the data.

**Results** A total of 127 post mastectomy patients participated in the study. Out of total 127 participants, 99 (77.95%) reported shoulder pain and disability on operated site. Age (P value = 0.181) and operated side i. e., right and left mastectomy (P value = 0.324) were not significantly associated with shoulder pain and disability. On the other hand marital status (P value = 0.04), educational status (P value = 0.03) profession (P value < 0.001) and time since surgery (P value = 0.04) were significantly associated with shoulder pain and disability.

**Conclusion** More than 2 third of post mastectomy patients suffer from shoulder pain and disability. Connective tissue fibrosis of shoulder joint seems to be the only reason for it. Physical therapy after mastectomy can help in preventing shoulder pain and disability.

### ZUSAMMENFASSUNG

**Ziel** Ziel dieser Studie war die Ermittlung von Schulderschmerzen und Funktionseinschränkungen bei Patientinnen nach Mastektomie.

**Methodik** Diese Querschnittsstudie wurde von Juni 2017 bis Juni 2018 in Peshawar, Pakistan, durchgeführt. Demografische Informationen und klinische Daten wurden mittels Fragebogen erhoben, der von den Patientinnen ausgefüllt wurde. Um Schulderschmerzen und Funktionseinschränkungen zu beurteilen, wurde der Shoulder Pain and Disability Index (SPADI) verwendet. In die Studie wurden Patientinnen nach Mastektomie im Alter zwischen 18 und 55 Jahren aufgenommen. Ausgeschlossen wurden Patientinnen mit Begleiterkrankungen, bilateraler Mastektomie, Traumata in der Anamnese, Schulderschmerzen vor der Mastektomie und Schulderschmerzen auf der nicht operierten Seite. Zur Analyse der Daten wurde SPSS Version 23 verwendet.

**Ergebnisse** Insgesamt nahmen 127 Patientinnen nach Mastektomie an der Studie teil. Von insgesamt 127 Studienteilnehmerinnen berichteten 99 (77,95%) über Schulderschmerzen und Funktionseinschränkungen auf der operierten Seite. Das Alter ( $p = 0,181$ ) und die operierte Seite, d. h. rechts- oder linksseitige Mastektomie ( $p = 0,324$ ) waren nicht signifikant assoziiert mit Schulderschmerzen und Funktionseinschränkungen. Dagegen konnte eine signifikante Beziehung zwischen Familienstand ( $p = 0,04$ ), Bildungsniveau ( $p = 0,03$ ), Beruf ( $p < 0,001$ ) und Zeit nach Operation ( $p = 0,04$ ) festgestellt werden.

**Schlussfolgerung** Mehr als zwei Drittel der Patientinnen nach Mastektomie leiden unter Schulterschmerzen und Funktionseinschränkungen. Der einzige Grund dafür scheint eine Fibrose

des Bindegewebes im Schultergelenk zu sein. Eine Physiotherapie im Anschluss an die Mastektomie kann Schulterschmerzen und Funktionseinschränkungen vorbeugen.

## Introduction

Shoulder pain is one of the most common musculoskeletal problem in post mastectomy patients [1, 2]. They are prone to develop shoulder pain due to connective tissue fibrosis of shoulder joint [3]. The main reason behind connective tissue fibrosis is restricted shoulder joint mobility after mastectomy [4, 5]. Shoulder pain among post mastectomy patients is an economic burden on the health care service providers due to its high prevalence, chronic characteristics and range of therapeutic interventions [6]. It is associated with decreased well being and are responsible for activity limitations [7].

According to conservative estimates, 17–60% of post mastectomy patients suffer from shoulder pain [8, 9]. Patients with shoulder pain experienced difficulty in dressing, personal hygiene and overhead activities [10]. Decrease range of motion worsen the condition and in most cases they are dependent on others for simple activities of daily living [11–13]. It is pertinent to mention that majority of these pain can be prevented if proper preventative strategies such as physical therapy exercises etc. are advocated after mastectomy [4, 14, 15].

Despite the fact that in clinical settings, shoulder pain is commonly reported by post mastectomy patients, yet exact statistics about shoulder pain and disability in this population are scarce in the literature. Therefore, current study was designed to determine the shoulder pain and disability among post mastectomy patients.

## Material and Methods

This cross sectional study was conducted in Peshawar Pakistan from June 2017 to June 2018. Demographic information and clinical characteristics of patients were collected through a self administered questionnaire while Shoulder Pain and Disability Index (SPADI) were used to evaluate shoulder pain and disability. SPADI is a disease specific instrument and self administered questionnaire which measures pain and disability due to shoulder pain. Cronbach's alpha value of SPADI is 0.94 while internal consistency is 0.92 [16].

Female post mastectomy patients with age between 18 to 55 years were included. Patients with co-morbidities (such as diabetes mellitus, hypertension and cardiac diseases etc.), bilateral mastectomy, history of trauma, history of shoulder pain before mastectomy and shoulder pain on non-operated side were excluded. 127 post mastectomy patients were included in the study. Informed consent was taken before data collection from all participants. A qualified physical therapist conducted subjective and objective examination in order to confirm whether source of pain is shoulder joint or not.

SPSS version 23 was used to analyze the data. Chi-square test was applied to find associations while p-value < 0.05 was considered as significant.

## Results

A total of 127 post mastectomy patients participated in the study. The mean age of the participants was  $34.69 \pm 6.76$  years. About half of participants ( $n = 68$ , 53.5%) underwent right mastectomy and 59 (46.5%) underwent left mastectomy. Majority ( $n = 104$ , 81.8%) of patients were married while 23 (18.1%) were single/divorced. 81 (63.8%) patients were uneducated while remaining 46 (36.2%) were educated. 89 (70.1%) patients were house wives, 20 (15.7%) were office workers and 18 (14.2%) were having other professions. Out of total 127 participants, 99 (77.95%) reported shoulder pain and disability on operated site.

A 10 point scale was used to quantify pain with 0 means "no pain" while 10 means "worst pain imaginable". Worst pain reported was  $2.06 \pm 2.2$  while pain when lying on the involved side was  $1.92 \pm 2.0$ , pain when reaching for something on a high shelf was  $1.98 \pm 2.1$ , pain when touching the back of neck was  $2.02 \pm 2.1$  and pain when pushing with the involved arm was  $1.98 \pm 2.1$  (► **Table 1**).

A 10 point scale was used to quantify disability with 0 means "no difficulty" in carrying out specific activities of daily living while 10 means "so difficult that it required help from others". Mean disability score when washing hair was  $1.88 \pm 2.05$ , washing back  $1.89 \pm 1.98$ , Putting on an undershirt or pullover sweater  $1.92 \pm 2.10$ , Putting on a shirt that buttons down the front  $1.87 \pm 2.02$ , Putting on pants  $1.80 \pm 1.94$  Placing an object on a high shelf  $1.93 \pm 2.01$ , Carrying a heavy object of 10 pounds  $1.97 \pm 2.23$ , Removing something from your back pocket  $1.73 \pm 2.11$  (► **Table 2**).

Majority of patients ( $n = 73$ , 81.1%) having age greater than 30 reported shoulder pain and disability. However age was not significantly associated with shoulder pain and disability ( $P$  value = 0.181). Similarly operated side i. e., right and left mastectomy was also not significantly associated with shoulder pain and disability ( $P$  value = 0.324). On the other hand marital status ( $P$  value = 0.04), educational status ( $P$  value = 0.03) profession ( $P$  value < 0.001) and time since surgery ( $P$  value = 0.04) were significantly associated with shoulder pain and disability (► **Table 3**).

## Discussion

Breast cancer is one of the alarming type of cancer which affect patients physically, socially and psychologically [17]. In advance stages, it is usually managed with surgery [18] Mastectomy is one of the surgical procedure for managing it [19]. However mastectomy is associated with certain complications. Shoulder pain is one such musculoskeletal complication of mastectomy [3]. After mastectomy, soft tissues around shoulder joint become tight and fibrotic if proper physical therapy exercises are not provided. In reality such complications can be minimized or even prevented in some cases but due to lack of education, most of the cases went unreported and thus psycho-social life of patient is distressed.

► **Table 1** Analysis of pain section of Shoulder pain and disability index (SPADI).

	Pain at its worst?	Pain when lying on the involved side?	Pain when reaching for something on a high shelf?	Pain when touching the back of your neck?	Pain when pushing with the involved arm?
Mean	2.06	1.92	1.98	2.02	1.98
Median	2	2	2	2	2
Mode	2	2	2	1	1
Std. Deviation	2.2	2.0	2.1	2.1	2.1
Variance	4.97	4.01	4.45	4.55	4.53
Skewness	2.07	2.01	2.09	2.03	2.04
Std. Error of Skewness	0.21	0.21	0.21	0.21	0.21
Kurtosis	4.39	4.35	4.64	4.40	4.38
Std. Error of Kurtosis	0.42	0.42	0.42	0.42	0.42
Range	10	9	9	9	9
Minimum	0	0	0	0	0
Maximum	10	9	9	9	9

► **Table 2** Analysis of disability section of Shoulder pain and disability index (SPADI).

	Washing your hair?	Washing your back?	Putting on an undershirt or pullover sweater?	Putting on a shirt that buttons down the front?	Putting on your pants?	Placing an object on a high shelf?	Carrying a heavy object of 10 pounds?	Removing something from your back pocket
Mean	1.88	1.89	1.92	1.87	1.80	1.93	1.97	1.73
Median	1	1	1	1	1	2	2	1
Mode	1	1	1	1	1	2	0	0
Std. Deviation	2.05	1.98	2.1	2.02	1.94	2.01	2.23	2.11
Variance	4.23	3.94	4.42	4.09	3.79	4.05	4.97	4.45
Skewness	1.98	2.14	2.19	2.18	2.21	2.12	1.92	2.14
Std. Error of Skewness	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Kurtosis	4.09	4.88	4.96	5.02	5.05	4.89	3.76	4.71
Std. Error of Kurtosis	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
Range	9	9	9	9	9	9	9	9
Minimum	0	0	0	0	0	0	0	0
Maximum	9	9	9	9	9	9	9	9

Mastectomy results in shoulder stiffness and pain, thus leading to decrease musculature strength and limitation of ROM [20]. These changes prevent post mastectomy patients from performing normal activities of daily living. Previous studies also reported that due to Pain and limited shoulder ROM majority of post mastectomy patients cannot perform ADL's effectively [21]. Awareness about prevention, early detection, and timely management of shoulder problems in post mastectomy patients is necessary to minimize human sufferings and financial costs [22]. The residual effects of surgical scarring following mastectomy could have effect on the mechanics of the shoulder region because of tethering of soft tissues [23].

Literature search also revealed that patients who underwent mastectomy are 6 times more likely to suffer from shoulder ROM restrictions and shoulder pain as compared to those patients who are conservatively treated. The asymmetry of soft tissue mobility and mass distribution across the chest wall that arises from loss of a breast will have effect on upper limb movements and contribute to trunk or arm symptoms. That's why scapular and shoulder kinematics are commonly disturbed in post mastectomy patients [21].

The results of current study showed that huge number of post mastectomy patients develop shoulder pain and disability. Despite the fact that current study has some limitations such as small sample size and no follow up, however current study is first of its kind which reported shoulder pain and disability among post mastec-

► **Table 3** Association of Pain and disability with age, gender, operated side, marital status, education, profession and time since surgery.

Parameters		Shoulder Pain		P-Value
		Yes	No	
Age (years)	≤ 30	26 (70.3%)	11 (29.7%)	0.181
	> 30	73 (81.1%)	17 (18.9%)	
Operated site	Right	52 (76.4%)	16 (23.6%)	0.324
	Left	47 (79.6%)	12 (20.4%)	
Marital status	Married	81 (77.8%)	23 (22.2%)	0.04
	Unmarried/Single	18 (78.2%)	5 (21.8%)	
Education	Uneducated	72 (88.8%)	9 (11.2%)	0.03
	Educated	27 (58.6%)	19 (41.4%)	
Profession	House wife	74 (83.1%)	15 (16.9%)	<0.001
	Office worker	12 (60.0%)	8 (40.0%)	
	Others	13 (72.2%)	5 (27.8%)	
Time since surgery	≤ 1 year	11 (45.8%)	13 (54.2%)	0.04
	2 years	13 (43.3%)	17 (56.7%)	
	3 years	9 (40.9%)	13 (59.1%)	
	4 year	14 (63.6%)	8 (36.4%)	
	≥ 5 years	23 (79.3%)	6 (20.7%)	

tomy patients in developing countries. Large prospective observational studies are recommended to truly determine its prevalence and associated studies.

## Conclusion

More than 2 third post mastectomy patients suffer from shoulder pain and disability. Marital status, educational status, profession and years' passed after surgery are significantly associated while age and operated side i. e., right and left mastectomies are insignificantly associated with shoulder pain and disability in post-mastectomy patients.

## Conflict of Interest

The authors declare that they have no financial affiliation with a company that is relevant to the article.

## References

- [1] Springer BA, Levy E, McGarvey C et al. Pre-operative assessment enables early diagnosis and recovery of shoulder function in patients with breast cancer. *Breast cancer research and treatment* 2010; 120: 135–147
- [2] Pérez-Palomares S, Oliván-Blázquez B, Pérez-Palomares A et al. Contribution of Dry Needling to Individualized Physical Therapy Treatment of Shoulder Pain: A Randomized Clinical Trial. *Journal of orthopaedic & sports physical therapy* 2017; 47: 11–20
- [3] Oliveira M, Gurgel M, Miranda M et al. Efficacy of shoulder exercises on locoregional complications in women undergoing radiotherapy for breast cancer: clinical trial. *Brazilian Journal of Physical Therapy* 2009; 13: 136–143
- [4] Barnes CP, Lam PH, Murrell GA. Short-term outcomes after arthroscopic capsular release for adhesive capsulitis. *Journal of Shoulder and Elbow Surgery* 2016
- [5] Badalamente MA. Treatment Options for Patients with Adhesive Capsulitis (Frozen Shoulder). *Dupuytren Disease and Related Diseases-The Cutting Edge: Springer* 2017; p. 363–369
- [6] Robinson C, Seah KM, Chee Y et al. Frozen shoulder. *J Bone Joint Surg Br* 2012; 94: 1–9
- [7] Dudkiewicz I, Oran A, Salai M et al. Idiopathic adhesive capsulitis: long-term results of conservative treatment. *The Israel Medical Association journal: IMAJ* 2004; 6: 524–526
- [8] Blomqvist L, Stark B, Engler N et al. Evaluation of arm and shoulder mobility and strength after modified radical mastectomy and radiotherapy. *Acta oncologica* 2004; 43: 280–283
- [9] Newman D. editor A prospective survey of injuries at first class counties in England and Wales 2001 and 2002 seasons. *Science and medicine in cricket: a collection of papers from the Second World Congress of Science and Medicine in Cricket Port Elizabeth: comPress* 2003
- [10] Rundquist PJ, Ludewig PM. Patterns of motion loss in subjects with idiopathic loss of shoulder range of motion. *Clinical biomechanics* 2004; 19: 810–818
- [11] Neviasser AS, Hannafin JA. Adhesive Capsulitis A Review of Current Treatment. *The American journal of sports medicine* 2010; 38: 2346–2356
- [12] Fabis J, Rzepka R, Fabis A et al. Shoulder proprioception – lessons we learned from idiopathic frozen shoulder. *BMC musculoskeletal disorders* 2016; 17: 1

- [13] Balcı NC, Yuruk ZO, Zeybek A et al. Acute effect of scapular proprioceptive neuromuscular facilitation (PNF) techniques and classic exercises in adhesive capsulitis: a randomized controlled trial. *Journal of physical therapy science* 2016; 28: 1219
- [14] Eljabu W, Klinger HM, von Knoch M. Prognostic factors and therapeutic options for treatment of frozen shoulder: a systematic review. *Archives of orthopaedic and trauma surgery* 2016; 136: 1–7
- [15] Sun Y, Lu S, Zhang P et al. Steroid Injection Versus Physiotherapy for Patients With Adhesive Capsulitis of the Shoulder: A PRIMSA Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Medicine*. 2016; 95: e3469
- [16] Luque-Suarez A, Rondon-Ramos A, Fernandez-Sanchez M et al. Spanish version of SPADI (shoulder pain and disability index) in musculoskeletal shoulder pain: a new 10-items version after confirmatory factor analysis. *Health and quality of life outcomes* 2016; 14: 32
- [17] Beyaz SG, Ergönerç JŞ, Ergönerç T et al. Postmastectomy pain: a cross-sectional study of prevalence, pain characteristics, and effects on quality of life. *Chinese medical journal* 2016; 129: 66
- [18] Singletary SE. Surgical margins in patients with early-stage breast cancer treated with breast conservation therapy. *The American journal of surgery* 2002; 184: 383–393
- [19] Kaur N, Petit J-Y, Rietjens M et al. Comparative study of surgical margins in oncoplastic surgery and quadrantectomy in breast cancer. *Annals of surgical oncology* 2005; 12: 539–545
- [20] Skalsky AJ, McDonald CM. Prevention and management of limb contractures in neuromuscular diseases. *Physical medicine and rehabilitation clinics of North America* 2012; 23: 675–687
- [21] Cheville AL, Tchou J. Barriers to rehabilitation following surgery for primary breast cancer. *Journal of surgical oncology* 2007; 95: 409–418
- [22] Armer JM, Hulett JM, Bernas M et al. Best-practice guidelines in assessment, risk reduction, management, and surveillance for post-breast cancer lymphedema. *Current breast cancer reports* 2013; 5: 134–144
- [23] Crosbie J, Kilbreath SL, Dylke E et al. Effects of mastectomy on shoulder and spinal kinematics during bilateral upper-limb movement. *Physical therapy* 2010; 90: 679