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Hip Fracture and Disabilities among Elderly in Gaza Governorates, Palestine

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Abstract

Hip fracture is the most common fracture in the elderly people and causes many disabilities for people who don't receive appropriate rehabilitation after fracture or surgery.

Objective: The general objective of this study is to recognize the disabilities arising as a result of hip fracture among the elderly in Gaza Strip.

Methods: a descriptive correlation cross sectional design was used. Face to face structured questionnaire and international Barthel index tool were used to determine the disabilities among hip fracture population. One hundred one patients with old hip fracture were included. Sixty patients were from Khan Younis city and forty-one patients from Rafah city. Descriptive statistics, ANOVA test, t-test, correlation coefficient and Scheffe Multiple Comparisons test were used to analyze results in the study.

Results: the results revealed that 82.2% of patients complaint from disability. 15.8% had total disability, 30.7% had severe disability, 19.8% had moderate disability, 9.9% had mild disability and 5.9% had minimal disability. Eighty-five percent of patients suffered from pain. 24.8% had mild pain, 36.6% had moderate pain, 17.8% had severe pain and 5.9% suffered from intolerable pain. The most common cause of hip fracture was falling down (81.2%). Also, the most common complications were failure of operation (32.3%), wound infection (29%) and bed sores (29%). The most common type of hip fracture operation was Plate & screw fixation which represented 63.1% from the operated patients. There were significant statistical differences between age and pain slope with development of disability.

Conclusion: hip fractures among the elderly caused a high percent of disability, complications and pain which can be reduced by improving operation's techniques and good rehabilitation programs.

Keywords Hip fracture, Disability, Elderly, Complications, Gaza strip.

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الإعاقات الناتجة عن كسور الورك لدى المسنين في قطاع غزة

ملخص الدراسة

كسور الورك من أكثر الكسور انتشاراً لدى كبار السن وتسبب كثير من الإعاقات الجسدية والنفسية للأشخاص الذين لا يتلقون خدمات التأهيل الطبي المناسب بعد الكسر أو بعد الجراحة.

الهدف العام: تهدف الدراسة لمعرفة مدي تأثير كسور الورك على حياة المرضى كبار السن بعد الإصابة وما قد يسببه من إعاقات ومضاعفات.

الإجراءات: تم عمل دراسة وصفية تحليلية وذلك باستخدام استبيان تم تعبئته وجهاً لوجه وكذلك باستخدام أداة "بارتل" العالمية لقياس نسبة الإعاقة لدى كبار السن. شارك في الدراسة (101) مريض ممن يعانون من كسور في الورك من مجمع ناصر الطبي (60 مريضا) ومستشفى غزة الأوروبي (41 مريضا). اعتمد الباحث التحليلات الوصفية و اختبار T و اختبار تحليل التباين و معامل الارتباط بالإضافة إلى تحليلات إحصائية أخرى.

النتائج: كشفت الدراسة أن حوالي(82.2%) من المرضى يعانون من إعاقة جسدية كمضاعفات لكسور الورك منهم (15.8%) إعاقة كاملة، (30.7%) إعاقة شديدة و (19.8%) إعاقة متوسطة و (9.9%) اعاقة بسيطة و (5.9%) اعاقة بسيطة جدا. حوالي (85%) من المرضى يعانون من آلام متنوعة بعد الإصابة، منهم (24.8%) يعانون من ألم بسيط ، (36.6%) يعانون من ألم متوسط، (17.8%) ألم شديد و(5.9%) يعانون من آلام غير محتملة. وكشفت الدراسة أن السبب الرئيسي لكسور الورك هو السقوط أثناء المشي حيث مثل (81.2%) من المشاركين. أثبتت الدراسة أن أهم مضاعفات كسور الورك كانت فشل العملية (32.3%) ثم التهاب الجرح (29%) وتقرحات الفراش (29%). كذلك كشفت الدراسة أن هناك دلالة إحصائية بين حدوث الاعاقة وعمر المريض ودرجة الالم.

الخلاصة: كسور مفصل الورك تسبب نسبة عالية من الإعاقة والمضاعفات والألم لدي مرضى كبار السن و التي ممكن الحد منها ومن مضاعفاتها بتطوير إجراءات التعقيم في العمليات الجراحية وعمل برامج تأهيل مناسبة لهؤلاء المرضى.

الكلمات المفتاحية: كسر الورك، الاعاقة، كبار السن، المضاعفات، قطاع غزة.

1. Introduction

Hip fracture is the most common fracture in the elderly people and causes many disabilities for people who don't receive rehabilitation after fracture or operation. Hip fracture patients experience high morbidity and mortality rates in the first post-operative year after discharge [1]. In many countries it is now a leading cause of death, disability and high health care cost. The hip fracture causes high percent of dependency after fracture [2]. In Gaza strip, many patients with hip fracture may not receive their proper post-operative management as a result of many causes including lack of rehabilitation hospitals, difficulties reaching rehabilitation centers, the economic status of our community, and the absence of caregiver of elderly people.

1.1 Significance of the study

In 2013, the estimated incidence rate of hip fracture in Gaza strip was 112 per 100,000 while in West bank was 110 per 100,000 [3]. According to unreported statistics from Gaza hospitals' archives, the incidence of hip fracture in 2005 was 93 per 100,000 and in 2006 was 97 per 100,000 and it was equal in both sexes. Consequently, the rise of disabilities as a result of this problem will increase. There is no basic database in the Ministry Of Health in Palestine about the incidence and prevalence, mortality, disabilities related to hip fracture, complications and risk factors.

The study of hip fracture is useful for health workers to help patients to overcome disabilities and to improve quality of life as much as possible. No previous studies have been located in the literature about hip fracture in Gaza Strip. Moreover, there is no study about how patients with hip fracture deal with their disabilities and difficulties such as transportation, difficulties to reach physiotherapy and rehabilitation's centers and lack of rehabilitation's hospitals.

This research will promote evidence-base management guidelines of hip fracture for local situation which will help improve patient's quality of life.

1.2 Literature review

Hip fracture is a devastating event with subsequent functional disability, morbidity, and mortality, all of which contribute toward tremendous health problems and economic costs [4]. The general categories of hip fractures include intra-capsular (femoral neck and head) and extra-capsular (intertrochanteric and sub-trochanteric) fractures [5]. In the vast majority of cases, a hip fracture is a fragility fracture arising from a fall or minor trauma in individuals with weakened osteoporotic bones, particularly in elderly individuals who are more likely to fall because of poorer balance, medication side effects, and difficulty in maneuvering around environment hazards [6].

Hip fracture substantially increases the risk of death and impaired functional status among the elderly [7]. Kapicioglu et al., (2014) found that hip fractures are challenging in extremely old patients and associated with increased mortality and disability [8].

Tsai et al. (2014) investigated whether hip fracture increases the risk of stroke in a large nationwide cohort study. They found that stroke incidence was 1.69-fold higher in the hip fracture cohort than in the comparison cohort. The hip fracture patients were at higher risk of developing ischemic stroke ((hazard ratio (HR) = 1.55, 95 % Confidence Interval (CI) = 1.42-1.69) and hemorrhagic stroke (HR = 1.55, 95 % CI = 1.16-1.89), respectively than a non-hip fracture cohort. They concluded that hip fracture is independently associated with increased risk of developing stroke. In addition, the risk of stroke following the incidence of hip fracture is more prominent in younger patients, men, those with cardiovascular comorbidities, and in patients using specific medication, such as diuretics [9].

Chiang et al (2013) investigated the risk of acute myocardial infarction (AMI) after hip fracture. About 8758 subjects were followed up from the date of enrollment until AMI, death, or the end of data collection. Multivariate analysis indicated that hip fracture was associated with a greater risk for AMI development (HR) = 1.29; (CI) 1.12-1.48; $p < 0.001$) [6]. They concluded that hip fracture is independently associated with a higher risk of subsequent AMI. Kannegaard et al., (2010) assessed excess mortality following hip fracture and identified reasons for the difference between mortality for the two genders. The study revealed that both male and female hip fracture patients were found to have an excess mortality rate compared to the general population. The cumulative mortality at 12 months among hip fracture patients compared to the general population was 37.1% in men and 26.4% in women. Moreover, there was a substantially higher mortality among male hip fracture patients than female hip fracture patients despite men being 4 years younger at the time of fracture [10].

Finally, in an interesting study, Williams et al., (2014) investigated whether hip fracture is associated with subsequent depressive symptoms in a sample of women. Symptoms of depression for women with and without fracture during the 12-month period were identified by self-report questionnaire. The study demonstrated that fracture is associated with increased depression in women with hip fracture [11].

1.3 General objective: to recognize disabilities resulting from hip fracture and their level among the elderly population in Gaza Strip

1.4 The specific objectives

1. To determine the main causes that may lead to hip fracture among the elderly population.
2. To determine the level of disability after hip fracture.
3. To recognize the most common complications after hip fracture.
4. To determine the management methods and strategies for hip fracture.
5. To determine the role of rehabilitation in preventing disability and complications after hip fracture.
6. To identify the level of pain resulting from hip fracture.
7. To assess the level of activities of daily living and mobility post-operatively.
8. To find the relationship between (bed-rest time, gender, causes of fracture, weight bearing time, physiotherapy, pain complaints, type of complications) and developing disabilities of hip fracture.

1.5 Operational definitions

Hip fracture: Any fracture of the thigh bone close to the upper end or involving the hip joint is a hip fracture and managed conservatively (without surgery) or with surgery and passed six months at least from the date of the fracture. This type will be determined according to International Classification of Diseases (ICD-10) where: S72.0 = Fracture neck of femur, S72.1 = Per-trochanteric fracture, S72.2 = Sub-trochanteric fracture [12].

Disability: Patient with restricted or lack of activity due to hip fracture. These are defined according to Barthel Index as listed in table 1.

Table 1 *Barthel Index for defining disability*

Categories	Total scores	Dependent level (disability)
1	0-24	Total
2	25-49	Severe
3	50-74	Moderate
4	75-90	Mild
5	91-99	Minimal

2. Methodology

2.1 Design: Descriptive, cross sectional design was used in the study.

2.2 Study population, sample and sampling techniques: The study population was all patients (male or female) over sixty years old with a history of hip fracture at least six months before the time of data collection without any history of disabling

diseases (as Hemiplegia or Parkinson's disease). The participants of the study were patients with hip fracture admitted to the main hospitals in south part of Gaza Strip (Nasser and European Gaza hospitals) before 2010. The sample was recruited randomly from the files of the entire population of hip fracture admitted to the two hospitals. According to the Epi-Info formula for calculating sample, the suitable number of the participants was 101 patients: 60 cases (59.4%) from Nasser hospital and 41 cases (40.6%) from European Gaza hospital. These percentages are proportional to the total number of patients in the two hospitals. We reached each participant either at his home or upon his visit to the outpatient clinic for follow-up.

2.3 Inclusion criteria: Persons over sixty years old (male or female); Person with a history of hip fracture and; The fracture history is more than six months.

2.4 Exclusion criteria: Person with any history of disabling diseases; Young patients with hip fracture (younger than 60 years old) and; new hip fracture (less than six months).

2.5 Questionnaire design and content: The instrument was divided into three parts:

1. General information which includes: Demographic information sheet involves gender, age, and residence place. Health profile: This part covers the following areas of interest: type of fracture, date of fracture, operation type, stay time in the hospital, pre and post-operative rehabilitation information, and post fracture complications questions.
2. Barthel Index tool: The Barthel Index [13] was originally devised as a means of clearly differentiating patients who are dependent in activity of daily living (ADL) from those who are not. The Barthel Index has been used extensively throughout the world, and it was described by [14] as the best measure available. The Barthel Index has been used in rehabilitation research and practice for more than 40 years. This instrument can be used to monitor the process of rehabilitation. It can establish a functional base line for a patient, follow his or her progress in rehabilitation program, and identify a point of maximum benefit after which improvement fail to occur. In addition, when functional dependence is due to environmental factors, the correction of these will immediately result in a higher score [15]. Each subscale, as well as the entire Barthel Index, gives a numerical score. Those scores, however, must be used with care when data are aggregated. The overall scores can be compared only with other overall scores on one or more persons. Individual category subscores can be treated similarly. Barthel Index is neither a metric nor a true ordinal scale, so only nonparametric statistics can be used in analysis. Much functional assessment research has been carried out by using the Barthel Index. A review of medical literature discloses many studies, in several languages (including French, German, Dutch, Japanese and Chinese), in which the Barthel Index was used. In addition, the Barthel Index has been used as the measure of ADL in studies of several impairment groups. The Barthel Index has also been used in studies of hip [16].

The Barthel Index consists of 10 items that measure a person's daily functioning specifically the activities of daily living and mobility. The items include feeding, moving from wheelchair to bed and return, grooming, transferring to and from a toilet, bathing, walking on level surface, going up and down stairs, dressing, continence of bowels and bladder. The Barthel Index is as good as any other single simple index. Barthel Index had a high level of validity and reliability [14].

The Barthel Index can be used to determine a baseline level of functioning and can be used to monitor improvement in activities of daily living over time. The items are weighted according to a scheme developed by the authors. The person receives a score based on whether they have received help while doing the task. The scores for each of the items are summed to create a total score. The higher the score is the more "independent" the person. Independence means that the person needs no assistance at any part of the task. In the United Kingdom quite frequently the 5, 10 and 15 scores are substituted by 1, 2, and 3. This gives a potential maximum of 20 rather than 100 table 2.
Guidelines for scoring:

- The index should be used as a record of what a patient does, not as a record of what a patient could do.
- The main aim is to establish a degree of independence from any help, physical or verbal, however minor and for whatever reason.
- Usually the patient's performance over the preceding 24/48 hours is important, but occasionally longer periods will be relevant
- Middle categories imply that the patient supplies over 50% of the effort
- Use of aids to be independent is allowed [13].

3. Pain scale: This scale is a visual analog scale for measuring pain or other symptoms. The patient instructed to mark the line at the point that corresponds to the degree of pain or severity of symptoms that are experienced. Because the participants are elderly, the scale is divided to five categories to simplify the procedure as follows: (0): free of pain; (1, 2, 3): slight pain; (4, 5, 6): moderate pain**;** (7, 8, 9): severe pain; (10): intolerable pain.

2.6 Ethical Considerations: Formal approval to conduct the study and collect the names and addresses of participants from hospitals' archives was obtained from the concerned authorities. Approvals from Palestinian Ministry Of Health mainly from Nasser, European Gaza, and Shifa hospitals' administrations and Helsinki Committee for medical research were taken to conduct the study. The patients who agreed to participate in the study were asked to sign a consent form. All participants have been informed that the participation is entirely voluntary and they can decide to terminate the interview at any point. Because the study is for people over sixty and cognitive abilities may be affected, the family members or the caregivers are included in the consent form.
2.7 Data analysis: SPSS program was used to analyze data. Correlation co-efficient (also known as R, or Pearson's r, a measure of the strength and direction of the linear relationship between two variables) mainly was used to determine if there is a relationship between the disability after hip fracture and some variables under study. T test (student's test) is used here to assess whether the means of two groups are statistically different from each other. Analysis of variance (ANOVA) and Scheffe Multiple Comparisons test were used to determine the relationship between disability and demographic data collected. ANOVA test is different from T test because it is used when there were more than two independent variables.

Table 2 *Activity scale*

Activity	**Score**
Feeding 0 = unable 5 = needs help cutting, spreading butter, etc., or requires modified diet 10 = independent	0 5 10
Bathing 0 = dependent 5 = independent (or in shower)	0 5
Grooming 0 = needs to help with personal care 5 = independent face/hair/teeth/shaving (implements provided)	0 5
Dressing 0 = dependent 5 = needs help but can do about half unaided 10 = independent (including buttons, zips, laces, etc.)	0 5 10
Bowels 0 = incontinent (or needs to be given enemas) 5 = occasional accident 10 = continent	0 5 10
Bladder 0 = incontinent, or catheterized and unable to manage alone 5 = occasional accident 10 = continent	0 5 10
Toilet Use 0 = dependent 5 = needs some help, but can do something alone 10 = independent (on and off, dressing, wiping)	0 5 10
Transfers (bed to chair and back) 0 = unable, no sitting balance 5 = major help (one or two people, physical), can sit 10 = minor help (verbal or physical) 15 = independent	0 5 10 15
Mobility (on level surfaces) 0 = immobile or < 50 yards 5 = wheelchair independent, including corners, > 50 yards 10 = walks with help of one person (verbal or physical) > 50 yards 15 = independent (but may use any aid; for example, stick) > 50 yards	0 5 10 15
Stairs 0 = unable 5 = needs help (verbal, physical, carrying aid) 10 = independent	0 5 10
TOTAL (0 - 100)	_____

3. Results

3.1 Age of participants: 40.6% from the sample age ranged from 60 to 70 years, 35.6% from 71 years to 80 years and 23.8% from the sample age over 80 years.

3.2 Health Profile: The cause of fracture: Falling down represents 81.2% from the causes, direct trauma represents 14.9%, bone disease represents 3.0% from the sample.

Management of fracture: About 16.8% of the participants was treated conservatively without surgery and 83.2% were treated by surgical intervention.

The days spent in the hospital before surgical intervention: Operation done immediately for 27.4% from the sample, 39.3% from the sample stayed 3 days before operation, 20.2% stayed one week before operation and 13.1% from the sample stayed more than one week of admission.

How many days were spent in the hospital after surgical intervention? About 6.0% from the sample stayed three days after surgical intervention, 41.7% stayed one week and 52.4% stayed more than one week after surgical intervention.

When weight bearing on affected limb was allowed? The weight bearing on affected limp was allowed to 7.1% from the sample immediately, 20.2% after one week, 29.8% after one month, and 42.9% after more than one month.

Discharging, receiving physiotherapy and complications: According to table 3, 87.13% from the sample was discharged from hospital to their home but 12.87% was discharged from hospital to another hospital. About 2 % from the sample received physiotherapy sessions before surgical intervention at hospital, 53.57 % from the sample received physiotherapy sessions after surgical intervention, while 32.67 % received physiotherapy sessions at home after discharging from hospital. Thirty percent (30.69%) from the sample was readmitted to hospital as a result of fracture complication. Eighty five percent (85.15%) from the sample suffered from pain as a result of fracture.

Table 3 *Receiving physiotherapy and complaining pain*

Number	Item	Yes		No		Mean	P-value
		No.	%	No.	%		
1	Was discharging from hospital to your home?	88	87.13	13	12.87	87.13	0.000
2	Was discharging from hospital to another hospital?	13	12.87	88	87.13	12.87	0.000
3	Did you receive physiotherapy sessions before surgical intervention at hospital?	2	1.98	99	98.02	1.98	0.000
4	Did you receive physiotherapy sessions after surgical intervention at hospital?	45	53.57	39	46.43	53.57	0.585
5	Did you receive physiotherapy at home after discharging from hospital?	33	32.67	68	67.33	32.67	0.001
6	Were you readmitted to hospital as a result of fracture complication?	31	30.69	70	69.31	30.69	0.000
7	Are you suffering from pain?	86	85.15	15	14.85	85.15	0.000

$P < 0.05$: significant

Types of complications: Table 4 shows that 31 participants developed complications. 29.0% of them had bed scores, 3.2% had chest infection, 29.0% had wound infection and the operation was failed for 32.3%.

Table 4 *Complications of hip fracture*

Complications	Frequency	Percent
Bed sores	9	29.0
Chest infection	1	3.2
Wound infection	9	29.0
Failure of operation	10	32.3
Others	2	6.5
Total	31	100.0

3.3 The level of pain: The results revealed that 24.8% from the sample were suffering from mild pain, 36.6% moderate pain, 17.8% severe pain, and 5.9% intolerable pain.

3.4 Barthel Index: The Barthel Index consists of 10 items that measure a person's daily functioning specifically the activities of daily living and mobility. The items include feeding, moving from wheelchair to bed and return, grooming, transferring to and from a toilet, bathing, walking on level surface, going up and down stairs, dressing, continence of bowels and bladder.

Feeding: About 5.9% from the sample are unable to feed, 10.9% needs help in cutting, spreading butter, etc., or requires modified diet to feeding, and 83.2% from the sample are independent.

Bathing: 58.4% from the sample were dependent at bathing while 41.6% were independent.

Grooming: 49.5% from the sample needs help with grooming, and 50.5% were independent for face/hair/teeth/shaving for grooming.

Dressing: 22.8% from the sample was dependent in dressing, 36.6% needed help but can do about half unaided for dressing, and 40.6% from the sample was independent (including buttons, zips, laces, etc.) in dressing.

Bowels: 13.9% from the sample was incontinent, 14.9% had occasional accident for bowels, and 71.3% were continent.

Bladder: 24.8% from the sample was incontinent, or catheterized and unable to manage bladder alone, 12.9% had occasional accident for bladder, and 62.4% was continent for bladder.

Toilet Use: 25.7% from the sample was independent in using toilet, 31.7% needed some help, but could do something alone in using toilet, and 42.6% was independent (on and off, dressing, wiping) in using toilet.

Transfers (bed to chair and back): about 20.8% from the sample was unable (no sitting balance to transfers, bed to chair and back), 22.8% needed major help, 26.7% needed minor help (verbal or physical) to transfers, and 29.7% was independent to transfers.

Mobility (on level surfaces): 48.5% from the sample was immobile, 13.9% from the sample walked with help of one person, and 25.7% was independent (but may use any aid; for example, stick).

Stairs: 66.3% from the sample was unable to climb stairs, 13.9% needed help (verbal, physical, carrying aid), and 19.8% from the sample was independent in climbing stairs.

Ranking all items of Barthel Index:
Table 5 shows that feeding has mean 88.61% and occupied the first position, bowels have

mean 78.71% and occupied the second position while climbing stairs has mean 26.73% and occupied the last position. The mean for the whole items of Barthel Index are 56.73%.

Table 5 *Mean for all items of Barthel index*

item	Total scale	Mean	Rank
Feeding	10	88.61	1
Bathing	5	41.58	7
Grooming	5	50.50	6
Dressing	10	58.91	4
Bowels	10	78.71	2
Bladder	10	68.81	3
Toilet Use	10	58.91	5
Transfers	15	55.12	5
Mobility	15	38.94	8
Stairs	10	26.73	9
Total	100	56.73	

Level of disability: According to the Barthel index score, figure 1 illustrates that 15.8% from the samples had a total disability, 30.7% had severe disability, 19.8% had moderate disability, 9.9% had mild disability, and 5.9% from the sample had minimal disability.

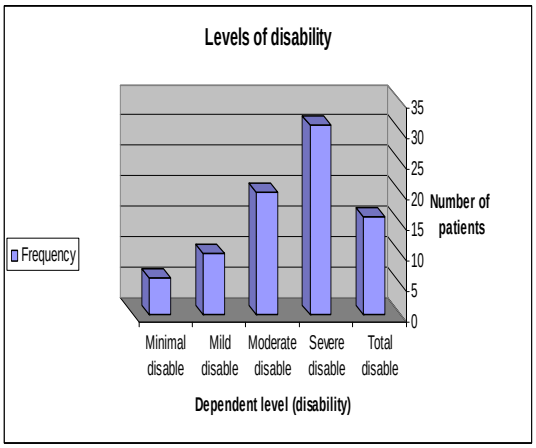

Figure 1 *Levels of disability according to the score of Barthel Index.*

3.5 Relationship between some variables and development of disability:

Bed rest time: According to table 7, bed rest (3 days, one week, 2 week, more than 2 weeks) had significant effect on the development of disabilities (the p-value equals 0.003 at significant level $\alpha = 0.05$).

Table 6 *ANOVA test for developed of disabilities due to time of bed rest at hospital*

	df	Mean Square	F	Sig.
Between Groups	3	3346.84	7.25	0.003
Within Groups	15	461.33		
Total	18			

P<0.05: significant

Scheffe Multiple Comparisons test table 7 showed that bed rest for "2 weeks" is significant to prevent the development of disabilities.

Gender: Table 8 illustrates that the p-value equals 0.212 which is greater than 0.05, which means that gender (male, female) has no significant effect on the development of disabilities.

Causes of fracture: ANOVA table 9 showed that the cause of fracture has no significant effect on development of disabilities (p-value equals 0.497 at significant level $\alpha = 0.05$).

Weight bearing time: No significant effect was found between weight bearing time on affected limb (immediately, one week, one month, more than one month) and development of disabilities (p-value equals 0.458 which is greater than 0.05) table 10.

Table 7 *Scheffe Multiple Comparisons test due to time of bed rest*

Mean difference	3 days	One week	2 weeks	More than 2 weeks
3days		13.0000-	71.0000*-	41.0000-
One week	23.0000		48.0000-	18.0000-
2 weeks	71.0000*	48.0000		30.0000
More than 2 weeks	41.0000	18.0000	30.0000-	

Table 8 *Independent sample T test for development of disabilities due to gender*

Gender	N	Mean	Std. Deviation	T test	p-value
Male	49	60.7143	33.15054	1.2578	0.212
Female	52	52.9808	28.27144		

P < 0.05: significant

Table 9 *ANOVA test for development of disabilities due to cause of fracture*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2294.811	3	764.937	0.800	0.497
Within Groups	92726.972	97	955.948		
Total	95021.782	100			

P<0.05: significant

Table 10 *ANOVA test for development of disabilities due to weight bearing on affected limb*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2469.646	3	823.215	0.874	0.458
Within Groups	75337.497	80	941.719		
Total	77807.143	83			

P < 0.05: significant

Physiotherapy: Table 11 illustrates that there was no significant effect on developing disabilities due to receiving physiotherapy (before, after surgical intervention at hospital, at home after discharging from hospital) (p-value equals 0.671, 0.985, 0.989 respectively at significant level $\alpha = 0.05$).

Pain complaint: Table 12 illustrates that suffering from pain as a result of fracture has significant effect on development of disabilities

Type of complications: ANOVA test showed that no significant effect were found between the type of complications (bed sores, chest infection, wound infection, failure of operation, others) and development of disabilities (p-value equal 0.940 at significant level $\alpha = 0.05$) table 13.

Table 11 *T-test for development of disabilities due to receiving physiotherapy*

	Answer	N	Mean	Std. Deviation	T test	p-value
Did you receive physiotherapy sessions before surgery?	Yes	2	47.500	10.606	-0.426	0.671
	No	99	56.919	31.091		
Did you receive physiotherapy sessions after surgical intervention?	Yes	45	58.333	28.062	0.018	0.985
	No	39	58.205	34.952		
Did you receive physiotherapy sessions at home after discharge?	Yes	33	56.666	35.059	-0.013	0.989
	No	68	56.747	28.829		

P < 0.05: significant

Table 12 *T-test for development of disabilities due to pain complaint*

	Answer	N	Mean	Std. Deviation	T test	p-value
Are you suffering from pain as a result of fracture?	Yes	86	53.720	29.874	-2.406	0.018
	No	15	74.000	31.520		

P < 0.05: significant

Table 13 *ANOVA for development of disabilities due to the type of complications*

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	643.450	4	160.862	0.193	0.940
Within Groups	21661.389	26	833.130		
Total	22304.839	30			

P < 0.05: significant

4. Discussion

The importance of this study comes from the fact that it is the first study in Gaza Strip to identify hip fracture and its related risk factors, causes and complications.

4.1 Hip fracture and gender: In this study, males constitute 48.5% of patients while female patients constitute 51.5%. That means the incidence of hip fracture for male and female were equal. By comparing our result with that of other countries worldwide, we find that, this result agrees with the ratio in Iran which was (1:1) [17]. The ratio in Lebanon was higher for females than males (2:1) [18]. On the other hand, in United Kingdom the percentage was very different. It was 22% for men and 78% for women [19]. The researchers think that the differences in the male to female between Gaza Strip and Iran on one side and Lebanon and European countries on the other side may be related to the lifestyle of female in those countries.

4.2 Time before operation: The waiting time before surgical intervention was too long in this study compared with other global studies. About 18% of patients underwent surgery on the same day of admission according to a study conducted by Casaletto and Gatt and 68% waited from (1-2) days and only 13% waited two days and more [20]. In our study, only 27.5% of patients were operated at the same day of fracture and 72.5% of patients were operated after three days of admission. The previous study concluded that survival at 1 year is better when patients who are medically fit for surgery are operated on the same day of admission. So, this delay in surgical intervention time may be one of the indicators for the increase disability among patients with hip fracture and increase mortality rate among these patients. A study conducted in USA to examine if delay surgery after hip fracture lead to worse outcomes, it found that, delays in surgery for hip fracture are associated with significant increase one year mortality [21]. The researchers recommended to operate as fast as possible if patient's condition allows in order to reduce post fracture mortality rate. This is supported by Bonnaire et al. that proved that surgical treatment within 6 hours improves results of osteosynthesis, within 24 hours reduces general complications, and within 48 hours reduces mortality [22].

4.3 Causes of fracture: The main cause of hip fracture was falling down []. It represents 81% from the sample. This result resembles the result of the study done in Jordanian population in 2001 which was 95% [24]. Worldwide, the main cause of hip fracture is falling down [2,25-27]. In our country the ratio is slightly less than the other countries. On the other side, the ratio of bone diseases that caused hip fracture is very low (3%).

4.4 Management of hip fracture: About 17% from the participants were treated conservatively without operation, just bed rest and medications. This result agrees with study conducted in USA that 17.7% of patients were treated conservatively [21]. In a study conducted in Taiwan, about 37.8% patients had hip hemi-arthroplasty, while in our study only 25.0% of the patients had hemi-arthroplasty. Taiwan study also showed that 51.2% had open reduction and internal fixation of fracture, and 10.5% had closed reduction of fracture with internal fixation [2] but in our study, 63.1% had open reduction of fracture with internal fixation and 9.5% had closed reduction of fracture with internal fixation.

4.5 Pain scale: There is a positive relation between presence of pain as an independent variable and occurrence of disability as dependent variable (P. value 0.018). This result emphasizes that severe or intolerable may lead to psychological depression and inactivity of the patient that may lead to disability. Severe pain was reported by 17.8% whereas 14.8% described no pain. These results are greater than the

results obtained by [28] who found that severe pain was reported by 10.2%, and 36.9% described no pain.

4.6 Physiotherapy: Surprisingly, physiotherapy after discharge was not statically significant for reducing disability among hip fracture patients (P- value 0.989). Many studies demonstrated different results [29-31]. One of these studies conducted in 2004 to determine the relation between physiotherapy and development of disability among hip fracture patients. It revealed that the extended outpatient rehabilitation can improve physical function and quality of life and reduce disability [30]. There are many possibilities to interpret our result. It may be due to inadequacy of local physical therapy centers to deal with patients suffering from these types of disabilities which did not match international standard or Patients who participated in physiotherapy programs might not be able to complete the needed course of physiotherapy. This may be because of difficulty in and high cost of transfer to physiotherapy departments especially if the residence place is too far or the high cost of private rehabilitation program at home.

4.7 Complications: About one third of participants were readmitted to hospital as a result of complications of hip fracture. This may increase the percent of disability among these patients. By classifying the types of complications, we found that, about 62% of complications related to the failure of operation, or wound infection; and 30% of complications related to inadequate family care and follow-up after discharge (bed sores). Jonathan [32] found that blood clots, pneumonia and infection are common complications associated with increase mortality after hip fracture. According to Robert et al. [33], posttraumatic osteoarthritis and nonunion may complicate up to 5% of non-displaced fractures and up to 25% of displaced fractures.

4.8 Barthel Index tool measurement: Most of the patients are independent or need some help in eating (about 95%). This means that, hip fracture does not affect eating skills and this is a logically accepted result. About 51% of the participants can take care of themselves, 25% could walk and only 19.8% could climb stairs. By comparison these results with those obtained by [34], 75% of patients take care of themselves one year after hip fracture. This result is greater than the result obtained in this study. Also, walking was recorded in 70.9% of patients and climb stairs recorded in 49.1%. All these results are greater than the results recorded in this study. Walking ability among Taiwanese was 58% at six months and 66% at twelve months post-operative [26]. This result was also greater than the result obtained in this study. Disability in mobility and using stairs were the most common in our study with mean 38.94 and 26.73 respectively. But in Canada disability in dressing and bathing were the most common category in Barthel Index [35]. This great percent of disability may be due to delayed surgery, bad sterile conditions, failure of PT and rehabilitation programs and lack of family educational programs.

4.9 Disability: In this study, 82.2% of patients suffered from disability and only 17.8% were free of disability. This result is similar to that found in a study conducted by [36] using Barthel Index scale and rehabilitation activities profile. Their results were 18% of surviving people reach the same level of functioning as before the fracture. Another study conducted in Canada [35] concluded that dressing and bathing were the most dependence category. But in our study, climb stairs was the worst dependence category with mean 26.73%.

The distribution of disability levels in the study showed that there were normal distributions of disability according to categories seen. Minimal and mild disability had the lowest percentage (5.9% and 9.9%), severe disability (30.7%) at the peak of the curve. Then the curve descends to determine the total disability (15.8%). There were no significant differences for developing disability due to gender, side of fracture, date

of fracture, types of managements, types of operation and weight bearing time after operation. On the other hand, there were significant differences in responses of the participants for development of disability due to age group which was positively at age group (60-70) year and time before operation which was positive at (2 week). In Canada, a study was conducted to determine functional dependence following hip fracture. Bathing and dressing disability was the most common. Increased risk of functional dependence was associated with, advanced age, more co-morbidities, hip pain, poor self-rated health, and previous employment in a high status occupation [35].

4.10 The ratio between disability and pain slopes: When comparing between disability and pain slopes, we found that the two slopes are like each other. In other words, patients suffering from mild disability complaint of mild pain while patients suffering from total disability complaint of intolerable pain. This result emphasizes the significant statistically correlation between pain as dependent variable and development of disability as independent variable. Becker et al. found that severe pain was associated with considerable mortality, a significant loss in function and social disintegration [28]. Chie et al. concluded that, hip pain was associated with increased risk of functional dependence [2].

5. Conclusion

The study revealed that 82.2% of patients complaint from disability. 15.8% had total disability, 30.7% had severe disability, 19.8% had moderate disability, 9.9% had mild disability and 5.9% had minimal disability. Eighty-five percent of patients suffered from pain. 24.8% had mild pain, 36.6% had moderate pain, 17.8% had severe pain and 5.9% suffered from intolerable pain. The most common cause of hip fracture was falling down (81.2%). Also, the most common complications were failure of operation (32.3%), wound infection (29%) and bed sores (29%). The most common type of hip fracture operation was Plate & screw fixation which represented 63.1% from the operated patients.

Regarding the Barthel Index tool measurement, most of the patients are independent or need some help in eating (about 95%). This means that, hip fracture does not affect eating skills and this is a logically accepted result. About 51% of the participants can take care of themselves, 25% could walk and only 19.8% could climb stairs. There were no significant statistical differences between disability and residence place, side of fracture, gender, causes of fracture, type of operation and receiving of physiotherapy. But there were significant statistical differences between age and pain slope with development of disability.

Recommendations: The study suggested that, good rehabilitation programs, pain management program, more sterilization techniques and family education may lead to decrease the number of disabled patients post hip fracture.

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