Assessment of anxiety and depression after lower limb amputation in Jordanian patients

Ziad M Hawamdeh[1]
Yasmin S Othman[2]
Alaa I Ibrahim[3]

[1]Department of Physical Therapy, Faculty of Rehabilitation Sciences, University of Jordan, Amman, Jordan; [2]Department of Orthotics and Prosthetics, Faculty of Rehabilitation Sciences, University of Jordan, Amman, Jordan; [3]Lecturer, Department of Physical Therapy for Pediatrics and Pediatric surgery, Faculty of Physical Therapy, Cairo University, Giza, Egypt

Objective: This study aimed to assess the prevalence of anxiety and depression among Jordanian lower limb amputees with different clinical characteristics and sociodemographic data (gender, marital status, social support, income, type and level of amputation, and occupation).

Methods: Participants were 56 patients with unilateral lower limb amputation with mean duration (8.4 ± 5.75 years). They were recruited from inpatient and outpatient clinics of Jordan University hospital, Royal Farah Rehabilitation Center, and Al-basheer hospital in Amman, Jordan. Participants responded to a questionnaire that included a battery of questions requesting brief information about sociodemographic variables and characteristics of amputation. The level of depression and anxiety in each participating patient was assessed by the Hospital Anxiety and Depression Scale (HADS).

Results: The prevalence of anxiety and depressive symptoms were 37% and 20%, respectively. Factors associated with high prevalence of psychological symptoms included female gender, lack of social support, unemployment, traumatic amputation, shorter time since amputation, and amputation below the knee. These findings were confirmed by a significant reduction of anxiety and depression scores in patients who received social support, patients with amputation due to disease, and patients with amputation above the knee. Presence of pain and use of prosthesis had no effect on the prevalence.

Conclusions: The findings of the present study highlight the high incidence of psychiatric disability and depression in amputees; it also showed the importance of sociodemographic factors in psychological adjustment to amputation. It is suggested that psychiatric evaluation and adequate rehabilitation should form a part of their overall management.

Keywords: amputees, depression; anxiety, rehabilitation

Introduction

Lower limb amputation is carried out for a variety of reasons including peripheral vascular disease, diabetes, trauma, tumor, or secondary infections. No studies on the incidence or the prevalence of amputation in Jordan are available, but Al-Woricat (1996) assessed the epidemiology of amputees in the Royal Medical Services in Jordan. He evaluated 865 amputees over 7.5 years and reported that the trans-tibial was the most common level of amputation (51.2%), followed by trans-femoral (17.57%); male to female ratio was 3.5:1, and trauma was the leading cause of amputation (50.17%), followed by diabetes mellitus (29%).

Most patients who lose a limb as a result of traumatic or surgical procedures encounter a series of complex psychological responses (Cansever et al 2003). Many people successfully use these responses to adjust to amputation, but others develop psychiatric symptoms (Frank et al 1984). Shula and colleagues (1982) and Frierson and Lippmann (1987) note that as many as 50% of all amputees require some sort of psychological intervention, and Shula and colleagues (1982) reported that depression is the most common psychological reaction among amputees.

Correspondence: Ziad M. Hawamdeh
Department of Physical Therapy, Faculty of Rehabilitation Sciences, 11942 Amman-Jordan
Tel +962777457263
Fax +96265346466
Email ziadnet2004@yahoo.co.uk

According to research by Kindon and Pearce (1982), Kohl (1984), and Cansever and colleagues (2003), psychological reactions to amputation depend on a number of factors, which include age and sex, type and level of amputation, lifelong patterns of coping with stress, value placed on the lost limb, and expectations from the rehabilitation program. Kohl (1984) added that the individuals affected by the traumatic loss of a limb are required to face a redefined body and self as well as a new reality.

Horgan and Maclachlan (2004) concluded that factors associated with positive adjustment to limb loss include greater time since amputation, more social support, greater satisfaction with the prosthesis, active coping attempts, an optimistic personality, a lower level of amputation in the case of lower limbs, and lower levels of phantom limb pain and stump pain.

National data on the prevalence of depression and anxiety among lower limb amputees in Jordan are not readily available. The aim of this study was to assess the prevalence of anxiety and depression in Jordanian patients with lower limb amputation with different clinical and sociodemographic data (gender, marital status, social support, income, type and level of amputation, and occupation).

Methods

Participants

This study included 56 lower limb amputees (83.9% [N = 47] males, 16.1% [N = 9] females, 18–73 years in age [mean 45 ± 18] (Tables 1 and 2) who were inpatients and outpatients recruited from Jordan University Hospital, Royal Rehabilitation Center at the King Hussain Medical Center, and Al-basheer Hospital in Amman, Jordan from January 2007 to June 2007. A total of 92 amputees were eligible to participate in our study.We were unable to contact 25 patients to obtain their complete data, 6 patients did not consent to participate, and 5 patients were excluded because they did not respond to part(s) of the questionnaire.

All study patients had amputation of one lower limb, 22 above the knee and 34 below the knee. One case of knee disarticulation was technically considered as above knee amputation. Thirty-three amputations were due to peripheral vascular disease and/or diabetes mellitus, and 2 due to malignancy. Of the 21 trauma amputees, 8 were due to road traffic accidents, 2 to mine explosions, and 1 to gun shot injury (Table 1 and 2).

A prosthesis was fitted, on average, 6 months after amputation; 32 patients had a modular prosthesis, 16 a conventional prosthesis, and 8 had no prosthesis.

Patients known to have congenital amputations, bilateral lower limb amputation, Syme's amputation, partial foot amputation, open amputation, upper limb amputation, cognitive deficits, previous history of psychiatric disorders before having amputation, or those known to use drugs that may cause anxiety or depression were excluded from the study.

The participants were fully informed about the nature of the study procedure and consent was obtained from each subject before participating in the study.

Evaluation

During a face to face interview participants were asked to respond to a questionnaire that included a battery of questions requesting brief sociodemographic information (age, sex, marital status, income, social support, use of prosthesis, and occupation) and clinical data (anxiety and depression scores, characteristics of amputation, duration since amputation, and complications related to amputation and use of prosthesis). Social support was evaluated using a single item measure of social support, which read "how many people do you have near you that you can readily count on for help in times of difficulty?". Response options were "0", "1", "2–5", "6–9", or "10 or more". Responses of 0 or 1 indicate negative social support; 2–5 or more indicate positive social support (Blake and McKay 1984). Income was reported in Jordanian dinars (JD) per month, 1 JD = US$1.4.

Table 1 Patient sociodemographic and clinical data

	Number no. (%)	Sociodemographic and clinical data mean (SD)				
		Age years	Duration months	Income (JD)	Anxiety score	Depression score
Total	56 (100)	45 ± 18	101 ± 69	147 ± 66	5.4 ± 5	3.9 ± 4.2
			Anxiety level			
Normal	35 (62.5)	43 ± 18	128 ± 73	162 ± 68	2 ± 2.4	1.9 ± 2.3
Abnormal	21 (37.5)	48 ± 17	56 ± 28	122 ± 56	10.9 ± 3.1	7.1 ± 4.8
			Depression level			
Normal	45 (80.4)	43 ± 18	115 ± 70	157 ± 68	4 ± 4.3	2.2 ± 1.9
Abnormal	11 (19.6)	54 ± 13	45 ± 29	105 ± 36	10.8 ± 4	10.9 ± 3.8

Table 2 Patient sociodemographic and clinical data according to their anxiety and depression levels

	Gender		**Marriage**		**Occupation**		**Social support**		**Type of amputation**		**Level of amputation**	
	♂	♀	**S.**	**M.**	**Yes**	**No**	**+ ve**	**– ve**	**T.**	**D.**	**AK.**	**BK.**
Total No. (%)	47 (83.9)	9 (16.1)	42 (75)	14 (25)	11 (19.6)	45 (80.4)	25 (44.6)	31 (55.4)	21 (37.5)	35 (62.5)	22 (39.3)	34 (60.7)
Anxiety score mean (SD)	**5.0 ± 5.0**	**7.6 ± 5.1**	**5.3 ± 5.1**	**5.7 ± 5.0**	**3.8 ± 4.1**	**5.8 ± 5.2**	**3.3 ± 4.0**	**7.1 ± 5.2**	**7.7 ± 5.3**	**4.0 ± 4.4**	**3.4 ± 4.5**	**6.7 ± 5.0**
Depression score mean (SD)	**3.8 ± 4.5**	**4.1 ± 2.6**	**4.3 ± 4.7**	**2.6 ± 2.1**	**2.1 ± 2.3**	**4.3 ± 4.5**	**2.4 ± 3.7**	**5.1 ± 4.3**	**6.0 ± 4.9**	**2.6 ± 3.2**	**2.8 ± 4.3**	**4.6 ± 4.1**
					Anxiety level							
Normal no. (%)	30 (63.8)	5 (55.6)	26 (62)	9 (64.3)	9 (81.8)	26 (57.8)	19 (76)	16 (51.6)	9 (42.9)	26 (74.3)	19 (86.4)	16 (47.1)
Abnormal no. (%)	17 (36.2)	4 (44.4)	16 (38.1)	5 (35.7)	2 (18)	19 (42.2)	6 (24)	15 (48.4)	12 (57.2)	9 (25.7)	3 (13.6)	18 (52.9)
					Depression level							
Normal no. (%)	38 (80.9)	7 (77.8)	32 (76.2)	13 (92.9)	11 (100)	34 (75.6)	24 (96)	21 (67.7)	11 (52.4)	34 (97.1)	20 (91.0)	25 (73.5)
Abnormal no. (%)	9 (19.1)	2 (22.2)	10 (23.8)	1 (7.1)	0 (0)	11 (24.4)	1 (4)	10 (32.3)	10 (47.6)	1 (2.9)	2 (9.1)	9 (26.5)

Abbreviations: ♂ Male, ♀ Female, S. Single, M. Married, + ve There was family support, - ve There was no family support, T. Traumatic, D. Disease, AK. Above knee, BK. Below knee.

The levels of depression and anxiety symptoms after lower limb amputation were assessed using a simple screening test, the Hospital Anxiety and Depression Scale (HADS), which has good sensitivity and specificity when used for formal psychiatric assessment and diagnosis (Zigmond and Snaith 1983). HADS is a validated scale for screening for symptoms of anxiety and depression and avoids confounding emotional symptoms with those of physical illness (Snaith and Taylor 1985).

Patients were asked seven questions to assess depression and seven questions to assess anxiety. Each question was answered on a four point (0–3) response category so the possible scores ranged from 0–21 for both anxiety and for depression. A score of 8 and above in either subscale was considered to be a case of psychological disturbance while scores of 0–7 were considered normal (Zigmond and Snaith 1983).

"Depression" was assessed according to questions such as: "Do you take as much interest in things as you used to do?" "Do you laugh as readily?" "Do you feel cheerful?" "Do you feel optimistic about the future?". "Anxiety" level was assessed by questions such as: "Do you feel tense or wound up?" "Do you worry a lot?" "Do you have panic attacks?" "Do you feel something awful is about to happen?".

Statistical analysis

Data were analyzed using SPSS (version 9.1; SPSS Inc, Chicago, IL). The collected data were statistically treated to show the mean, range, standard deviation, and standard error of mean for all sets of continuous variables such as age, income, and time since amputation. Frequency distribution was done also for all categorized variables such as gender, occupation, family support, and type of amputation. Independent t-test was conducted to compare anxiety and depression scores among patients with opposing sociodemographic data. A P-value of <0.05 is considered significant.

Results

General characteristics

Of the 56 patients, Seventy-five percent (N = 42) were single and 25% (N = 14) were married; 80% (N = 45) had no work and 20% (N = 11) had work; 55% (N = 31) received no social support and 45% (N = 25) received good social support.

Anxiety level

Based on HADS our results showed that among the 56 amputees, 63% (N = 35) were normal (Anxiety score 2 ± 2.4, income 162 ± 68 JD, and amputation duration 128 ± 73 months) while 37.5% (N = 21) were abnormal (Anxiety score

10.9 ± 3.1, income 122 ± 56 JD, and amputation duration 56 ± 28 months) (Table 1). Comparing different anxiety scores revealed a significant decrease in the score between patients who received social support (mean = 3.3 ± 4.0) compared to those without support (mean = 7.1 ± 5.2), patients with amputation due to disease (mean = 4.0 ± 4.4) compared to those due to trauma (mean = 7.7 ± 5.3), and in patients with above knee amputation (mean = 3.4 ± 4.5) compared to those with below knee amputation (mean = 6.7 ± 5.0) with p values equal (0.004, 0.006, and 0.01 respectively). However, no significant difference was found between males versus females, single versus married, and employed versus unemployed with p values equal (0.15, 0.77, and 0.25 respectively) (Table 2).

Forty-four percent (N = 4) of females had anxiety compared with 36% (N = 17) of males. Also, 36% (N = 5) of married individuals had anxiety compared with 38% (N = 16) of singles. We recorded that 82% (N = 9) of individuals who had work were normal compared with 58% (N = 26) of individuals who had no work. Individuals who received no social support were anxious more frequently, that is, 48% (N = 15), than those who received social support 24% (N = 6). Fifty-seven percent (N = 12) of amputated cases as a result of trauma showed anxiety and only 26% (N = 9) of amputated cases as a result of disease showed anxiety. Fifty three percent (N = 18) of cases with below knee amputation had anxiety compared with 14 % (N = 3) in cases with above knee amputation (Table 2 and Figure 1).

Depression level

Data of the 56 amputees showed that 80% (N = 45) were normal (Depression score 2.2 ± 1.9, income 157 ± 68 JD, and amputation duration 115 ± 70 months) while 20% (N = 11) were abnormal (Depression score of 10.9 ± 3.8, income 105 ± 36 JD, and amputation duration 45 ± 29 months) (Table 1). Comparing depression scores showed a significant decrease in the score of patients who received social support (mean = 2.4 ± 3.7) compared with those without support (mean = 5.1 ± 4.3), and in patients with amputation due to disease (mean = 2.6 ± 3.2) compared with those with amputation due to trauma (mean = 6.0 ± 4.9) with p values equal (0.01 and 0.002 respectively). On the other hand no significant difference was found between males versus females, single versus married, employed versus unemployed, and above knee versus below knee with p values equal (0.85, 0.21, 0.12, and 0.11 respectively) (Table 2).

It is important to mention that the eleven cases who showed depression, according to the HADS, had no work. Ten of them were single, received no social support, and their amputations were the result of trauma. Furthermore, nine of them were males and had below knee amputation (Table 2 and Figure 2).

Discussion

Many studies have investigated the prevalence of depression and anxiety among individuals with lower limb amputations.

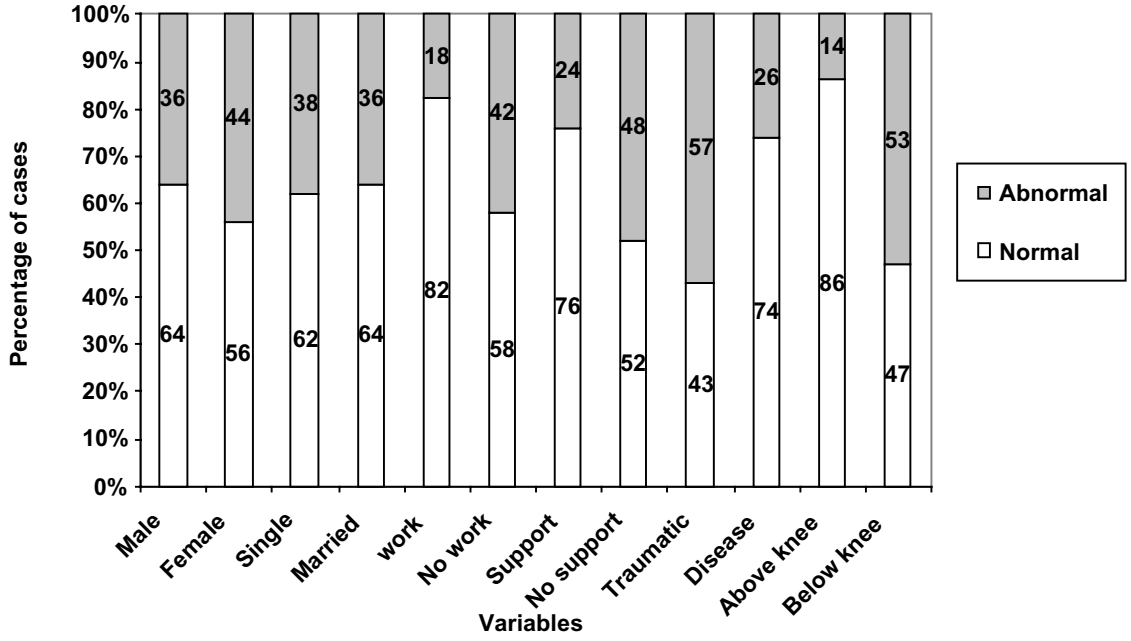

Figure 1 Variables presented as percentage of cases in different levels of anxiety.

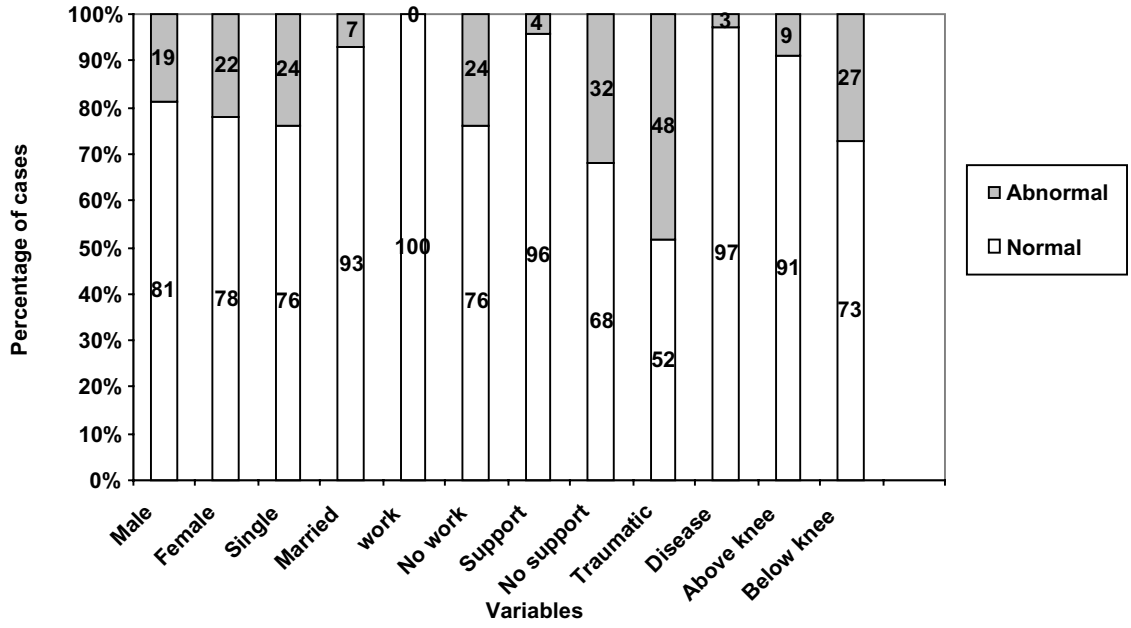

Figure 2 Variables presented as percentage of cases in different levels of depression.

In our study, prevalence of depressive and anxiety symptoms were 20% and 37% respectively, which is consistent with several previous studies that confirmed high rates of anxiety and depressive symptoms after amputation with prevalence up to 41% (Kashani et al 1983; Schubert et al 1992; Hill et al 1995; Cansever et al 2003; Atherton and Robertson 2006; Seidel et al 2006).

Several studies have reported no relationship between time since amputation and depressive symptoms (Rybarczyk et al 1992; Thompson et al 1984) or psychiatric symptoms (Horgan and Maclachlan 2004). However, our data revealed that the longer the time since amputation, the lesser is the prevalence of psychological abnormalities which is evident for either anxiety or depression, which could be attributed to psychological adjustments that follow amputation. In their review of psychological adjustments to amputation Horgan and Maclachlan (2004) concluded that although depression and anxiety appear to be relatively high up to 2 years post amputation, they decline thereafter to levels comparable to those in the general population. A recent study showed rapid resolution of depressive and anxiety symptoms in individuals with lower limb amputation after a period of inpatient rehabilitation (average period 54.3 days) (Singh and Hunter 2007).

Gender is one sociodemographic factor that could be associated with outcome following amputation. In terms of psychological well-being following amputation, most studies have found no difference in psychosocial outcome between men and women (Bradway et al 1984; Williamson 1995; Williamson and Walters 1996). The data from our study revealed that females suffered from more reactive depression and anxiety symptoms than males. This result is similar to those of previous studies performed by Kashani and colleagues (1983), O'Toole and colleagues (1984), and Pezzin and colleagues (2000), which have reported that women are more likely to experience depression, and to perform more poorly on a measure that includes an assessment of emotional adaptability.

In terms of the cause of amputation, in both subscales, our results showed that traumatic amputees had higher levels of depression and anxiety compared with those who had their amputation because of disease. In accordance with our results, Fisher and Hanspal (1998) and Livneh and colleagues (1999) suggested that young adults with traumatic amputation may be at higher risk of major depression compared with individuals with disease-related amputations. Other studies examining the relationship between cause of amputation and psychosocial outcome have found no effect of amputation on psychiatric symptoms (Shukla et al 1982), anxiety (Weinstein 1985), and depressive symptoms (Kashani et al 1983; Rybarczyk et al 1992; Williamson and Walters 1996).

According to Engstorm and colleagues (2001), the amputee's current family reactions can have a powerful effect on adjustment. Our results showed that single patients and patients with no social support had

experienced more depression and anxiety. Williamson and colleagues (1984), Thompson and Haran (1984), Rybarczyk and colleagues (1992), and Rybarczyk and colleagues (1995), found that increased social isolation and lower levels of perceived social support are associated with higher levels of depressive symptomatology. Particularly helpful in the adjustment of the adult amputee is the presence of a supportive partner who assumes a flexible approach, takes over functions when needed, but at all times maintains the amputee's self-esteem (Kohl 1984; Parkes 1976).

The results of the current study showed that BK amputees had higher levels of depression compared with AK amputees. According to Weinstein (1985), despite the fact that above knee AK amputations are associated with poorer rehabilitation outcomes and higher levels of activity restriction, AK amputations have not been found to be associated with increased levels of anxiety, social discomfort, general psychiatric symptoms (Shukla et al 1982), depression (Behel et al 2002), or adjustment to amputation (Tyc 1992). Most notably, O'Toole et al (1984) found that the relationship between amputation level and psychological outcome showed that individuals with below knee (BK) amputation were more likely to be depressed than those with AK amputations. It was suggested that because individuals with BK amputations are less severely disabled in terms of functioning than those with AK amputations, they may be in a better position to compare their functional abilities with their premorbid abilities and, as a result, be more sensitive to the differences between themselves and able-bodied individuals (O'Toole et al 1984).

In terms of the vocational factor, current amputees of this study reacted with more depression and anxiety symptoms if they were unemployed or had a low income. These results are supported by Seymour (2002), who reported that patients with a disability, who cannot do their former jobs and who face a loss of income will have more adjustment problems. According to Engstorm and colleagues (2001), employment prospects have a powerful affect on individuals, both at the level of their sense of identity and their social and financial situation.

The current study had certain limitations: 1) the small sample, 2) the wide variety in age, 3) and the study was descriptive, therefore the subjects were not followed longitudinally. Many subjects with surgical amputations have associated illnesses such as diabetes mellitus which may contribute to their symptoms. Future studies investigating other demographic/social factors can expand the role of depression and anxiety after lower limb amputation (eg, sexuality, phantom pain, type and fitting of prosthesis).

Conclusion

Our data confirm the high prevalence of psychiatric disorders after lower limb amputation. The data also showed the importance of sociodemographic factors in psychological adjustment to amputation. Thus we recommend adequate psychiatric evaluation, follow up, and rehabilitation for all individuals with lower limb amputation, and especially for those with a high propensity for these disorders. Preoperative preparation, early prosthetic fitting and mobilization, vocational rehabilitation and psychotherapy may be adequate approaches to decrease the impact of disability and improve functional outcomes and quality of life in this population, and should be a concern for all health professionals involved in the care of amputees. Extensive rehabilitation with the use of an interdisciplinary team approach is one of the most successful ways to return the amputee to the work place. Orthopaedic surgeons should give more attention to the psychological state of amputees. A combination of occupational therapy, physical therapy, vocational rehabilitation, and psychological support generally promote a sense of well being and return the amputee to a level of independence.

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