



Special issue on Medicine and Society



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From the Editor

Special editorial - Medicine and Society

Family medicine is a division of primary care that provides continuing and comprehensive health care for the individual and family across all ages, genders, diseases, and parts of the body. It is based on knowledge of the patient in the context of the family and the community, emphasizing disease prevention and health promotion. According to the World Organization of Family Doctors (Wonca), the aim of family medicine is to provide personal, comprehensive and continuing care for the individual in the context of the family and the community.

Family medicine therefore looks at the individual in terms of family, community, geography, epidemiology, climate and the multitude of factors that affect the human condition - the geo-political and socio-political landscape.

This special issue of MEJFM focuses on Medicine and Society in the Middle East and South Asia region (MESA), our largest readership, and the many factors affecting the health of MESA populations and society, from clinical and epidemiological research, to societal problems, to care of patients and to patient's evaluation of that care.

As conflict and diversity of opinion is also an aspect that can affect psycho social health in the region, we have let authors voice their opinion if they were inclined, as a quality society allows for freedom of speech and tolerance of diversity of opinion as well as religion and race.

Many societal factors contributing to poor health cannot be readily overcome – displaced persons (refugees), wars and factional fighting. Regional family doctors are both picking up the pieces of broken societies as well as positively contributing to a brighter future for their patient populations.

We feature on our cover an article on lack of education for Iraqi girls and the many factors preventing them from attaining an education. So many indicators show that education of girls is the best way to lift the health, wealth and happiness of any society. Tragic that so many bright young lives, as well as their communities, are not given a chance.

Conversely the national school feeding project in Jordan has been highly successful in getting poor children, boys and girls, into school as well as contributing to better nutrition of Jordanian school children and stands out as a great example.

I wish all of our readers and our authors well in these troubling times.

Lesley Pocock
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Therapeutic effect of pregabalin, Vitamin B-groups and their combination on patients with diabetic peripheral poly neuropathy

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Abstract

Background and Objective: The main micro vascular complications of diabetes mellitus (DM) are neuropathy, nephropathy and retinopathy. This study was designed to evaluate and compare the effectiveness of pregabalin, Vitamin B-groups and their combination in treating patients with diabetic peripheral neuropathy (DPN).

Methods and patients: Fifteen healthy volunteers and 45 patients with diabetic neuropathy with HbA1c ranging between (6.7-12.2) % were included in this study. The patients were randomized into three groups of 15 patients each. The first group received pregabalin capsule for six weeks. The second group received B-complex tablet (B1 vitamin, B6 vitamin, B12 vitamin) twice daily for six weeks. The third group received pregabalin capsule with B-complex tablet for six weeks.

Results: Pregabalin did not significantly improve the latency of nerve conduction study in patients with DPN, but pregabalin induced a significant improvement in the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, left peroneal nerve at the fibular head and left tibial nerve at the popliteal fossa, while pregabalin could induce a significant improvement in the conduction velocity of right tibial nerve and left tibial nerve. Administration of Vitamin B-groups demonstrated a significant improvement in the latency of right tibial nerve at the ankle and left tibial nerve at the popliteal fossa of patients with DPN when compared to the pretreated patients. Furthermore, vitamin B-groups showed an improvement in the latency of left peroneal nerve at the ankle and left tibial nerve at the ankle in patients with DPN, whereas vitamin B-groups showed a significant improvement in the amplitude of right peroneal nerve at the fibular head. Daily use of

vitamin B-groups produced a significant improvement in the conduction velocity of right peroneal nerve. Administration of the combined drugs did not significantly improve the latency of left peroneal nerve at the fibular head, right and left tibial nerve at the ankle, right and left tibial nerve at the popliteal fossa in patients with DPN. Nonetheless combination of pregabalin and vitamin B-groups induced a significant improvement in the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, right peroneal nerve at the fibular head, right tibial nerve at the popliteal fossa, and left tibial nerve at the popliteal fossa of patients with DPN. Nonetheless the combined drugs could significantly recover the conduction velocity of left tibial nerve in DPN patients.

Patients receiving pregabalin for six weeks demonstrated a significant increase in the level of direct bilirubin and aspartate aminotransferase (AST). Receiving pregabalin treatment has no hazardous effect on the kidney function. Pregabalin had significantly increased the serum level of malondialdehyde of patients with diabetic peripheral neuropathy.

Conclusion: Vitamin B-groups were more efficacious than the pregabalin in improving latency of patients with DPN, while combined drugs have significantly caused greater improvement in the amplitude, than the pregabalin and vitamin B-groups. However no significant differences were found between pregabalin, Vitamin B-groups, and their combination in improving the conduction velocity in patients with DPN.

Key words: diabetic peripheral neuropathy, pregabalin, Vitamin B-groups

Introduction

Neuropathy is considered the most common micro-vascular complication of both types 1 and 2 diabetes mellitus affecting up to 50% of type 2 diabetic patients (1, 2). Increasing age, longer duration of diabetes and poor glycaemic control are well recognized risk factors for diabetic peripheral neuropathy (DPN), while cigarette smoking, hypertension, obesity, hyperlipidaemia and microalbuminuria have also been implicated as potential risk markers (3).

Diabetic peripheral neuropathy is considered a main risk factor for amputation, and hence a significant cause of morbidity in DM (4). Neuropathic disorders in diabetes can impair the function of the central, peripheral and/or autonomic nervous systems (5). The typical DPN is a chronic, symmetrical, length - dependent sensory motor polyneuropathy (6).

Distal symmetrical sensorimotor polyneuropathy is the most common type of diabetic neuropathy. It involves both small and large fibers and has an insidious onset. Typically, the most distal parts of the extremities are affected first, resulting in a stocking pattern of sensory loss (7), which is characterized by pain, numbness, and tingling in the extremities and slow nerve conduction (8). The diagnostic criteria of DPN include the presence of any abnormality (Nerve conduction velocity, amplitude, or latency) in two or more nerves on an electrophysiological test (9).

Many patients with DPN will require pharmacological treatment for painful symptoms: several agents have efficacy confirmed in published randomized controlled trials, although with the exception of Duloxetine and Pregabalin, none of the others is specifically licensed for the management of painful DPN (10). Treatments that may be beneficial for painful diabetic neuropathy include a number of antidepressants (eg, amitriptyline, duloxetine, venlafaxine) and anticonvulsants (eg, pregabalin, sodium valproate) as well as some topical agents such as capsaicin cream, lidocaine patch, and isosorbide dinitrate topical spray (11, 12). Many studies suggest the use of vitamin B-complex for the management of diabetic neuropathy. (13, 14).

Pregabalin is recommended as a first-line treatment for neuropathic pain by the Neuropathic Pain Special Interest Group of the International Association for the Study of Pain (15). It is also recommended as a first-line treatment for DPN and central neuropathic pain by the European Federation of Neurological Societies (16) and as first-line treatment for DPN by the American Academy of Neurology (17). The course of DPN is variable. A population based study states that 10% of patients with DPN had their symptoms worsened over two years, 81% remained unchanged and 9% had improved (18).

Pregabalin 150-600 mg/day has been shown to be effective at relieving pain and reducing pain-related sleep interference in numerous well controlled trials of patients with DPN (19).

The aim of this study was to evaluate and compare the effectiveness of Pregabalin, Vitamin B-groups and their combination in treating patients with diabetic peripheral poly neuropathy, moreover the effect of pregabalin on liver function, renal function and oxidative stress.

Patients and Methods

This study was conducted at the Leila Qasm Diabetic centre, Erbil and Hawler Teaching Hospital/ Neurophysiology Unit, Erbil, from January 2013 to September 2013. Fifteen healthy volunteers and forty five patients with diabetic peripheral neuropathy were included in this study. Electromyography and biochemical tests were carried out on both the healthy volunteers and patients groups.

The control:

The control group consisted of fifteen healthy volunteers. The age of this group ranged between 20 and 55 years. All those subjects were healthy, symptom free and with no history of systemic disease or family history of diabetes mellitus. Among this group there were no histories of alcohol abuse, drug intake, or any other alternative cause of neuropathy.

The patient:

Forty five patients with diabetic neuropathy with HbA1c ranging between (6.7-12.2) %, (Mean \pm SD= 9.44 \pm 1.47) with age ranging between (30-55) years, were enrolled. This study was conducted at the Laeila Qasm Diabetic Centre, Erbil, Iraq. The ethical approval was obtained from the Ethical Committee of the College of Medicine at Hawler Medical University based on the principles of the declaration of Helsinki as revised in 2000; all patient gave informed consent.

The Inclusion criteria were predefined as follows:

- 1- Both males or females of any race over 18 years of age.
- 2- Patients with either type1 or type2 diabetes, who have been on stable anti diabetic medication regimen for at least 30 days prior to randomization.
- 3- Duration of painful diabetic peripheral neuropathy was required to be more than three months.

The criteria for exclusion were as follows:

- 1- History of smoking, alcohol consumption, and thyroid gland disorder.
- 2- Patients with any kidney disorder or any conditions that could confound assessment of pain due to diabetic peripheral neuropathy.

Study protocol:

The patients were randomized into three groups of 15 patients each

- The first group received pregabalin capsule (75mg twice daily) for six weeks.
- The second group received B-complex tablet [B1 vitamin (250mg), B6 vitamin (250mg), B12 vitamin (1mg)] twice daily for six weeks.
- The third group received pregabalin capsule (75mg twice daily) with

- The third group received pregabalin capsule (75mg twice daily) with B-complex tablet [B1 vitamin (250mg), B6 vitamin (250mg), B12 vitamin (1mg)] twice daily for six weeks. The blood samples from the first group was taken before, and six weeks after the intervention and the investigations included liver function test, renal function test, HbA1c, and malondialdehyde. Thereafter the patients were sent to Electrophysiological unit at

Hawler Teaching Hospital for performing the nerve conduction study before and six weeks after receiving the medication.

The data of Motor nerve conduction studies were analyzed using (Nicolet, Madison, WI, USA) software program.

Results

Effects of pregabalin on nerve conduction study of motor nerve of lower limb

Administration of pregabalin 75mg twice daily did not significantly improve the latency of right tibial nerve at the ankle, left tibial nerve at the ankle, right tibial nerve at the popliteal fossa and left tibial nerve at the popliteal fossa of patients with diabetic peripheral neuropathy when compared to the control group. However no significant differences were found between the latency of the control group and patients with DPN in right peroneal nerve at the ankle, left peroneal nerve at the ankle, right peroneal nerve at the fibular head and left peroneal nerve at the fibular head Table 1.

Table 1: Effects of pregabalin (75mg) on latency (ms) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy.

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve (ankle)	3.72 ± 0.06 a	4.01 ± 0.41 a	3.7 ± 0.35 a
Left peroneal nerve (ankle)	3.32 ± 0.12 a	3.98 ± 0.34 a	3.88 ± 0.32 a
Right peroneal nerve (fibular head)	10.33 ± 0.17 a	12.1 ± 0.87 a	11.13 ± 0.72 a
Left peroneal nerve (fibular head)	10.05 ± 0.21 a	12.28 ± 1.09 a	11.87 ± 1.01 a
Right tibial nerve (ankle)	3.07 ± 0.11 a	5.23 ± 0.41 b	4.78 ± 0.29 b
Left tibial nerve (ankle)	3.03 ± 0.08 a	4.78 ± 0.37 b	4.7 ± 0.44 b
Right tibial nerve (popliteal fossa)	10.22 ± 0.28 a	14.28 ± 1.18 b	14.18 ± 1.03 b
Left tibial nerve (popliteal fossa)	10.2 ± 0.2 a	14.75 ± 1.11 b	14.33 ± 1.26 b

- Mean values ± S.E are presented.
- ms= millisecond.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of pregabalin on amplitude:

The effects of pregabalin on the amplitude (mv) of the motor nerve conduction study of lower limb in patients with DPN are shown in table (2). Pregabalin induced a significant improvement in the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, left peroneal nerve at the fibular head and left tibial nerve at the popliteal fossa when compared to the pretreated patients but did not significantly reach the mean of the control healthy group. Pregabalin did not significantly improve the amplitude of right peroneal nerve at the fibular head, right tibial nerve at the ankle, left tibial nerve at the ankle and right tibial nerve at the popliteal fossa in patients with DPN when compared to the control group as shown in Table 2

Table 2: Effects of pregabalin (75mg) on amplitude (mV) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy.

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve(ankle)	5.35 ± 0.63 a	1.37 ± 0.22 c	2.67 ± 0.26 b
Left peroneal nerve (ankle)	4.86 ± 0.24 a	1.14 ± 0.23 c	2.34 ± 0.38 b
Right peroneal nerve (fibular head)	5 ± 0.35 a	1.1 ± 0.16 b	2.12 ± 0.47 b
Left peroneal nerve (fibular head)	4.29 ± 0.14 a	0.9 ± 0.1 c	2.49 ± 0.44 b
Right tibial nerve (ankle)	12.85 ± 1.21 a	1.85 ± 0.23 b	3.33 ± 1.01 b
Left tibial nerve (ankle)	9.54 ± 1.33 a	1.79 ± 0.29 b	3.73 ± 0.63 b
Right tibial nerve (popliteal fossa)	9.4 ± 0.7 a	0.95 ± 0.1 b	1.88 ± 0.22 b
Left tibial nerve (popliteal fossa)	7.53 ± 0.73 a	1.66 ± 0.36 c	3.58 ± 0.45 b

- Mean values ± S.E are presented.
- mV=millivolt
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of pregabalin on conduction velocity:

As shown in Table 3 pregabalin did not significantly improve the conduction velocity of right peroneal nerve and left peroneal nerve in patients with DPN when compared with the control group. However pregabalin could induce a significant improvement in the conduction velocity of right tibial nerve and left tibial nerve when compared to the positive control subject but did not significantly reach the mean of control healthy group.

Table 3: Effects of pregabalin (75mg) on conduction velocity (mm/s) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve	50.67 ± 0.92 a	22.78 ± 4.49 b	27.78 ± 4.04 b
Left peroneal nerve	50.71 ± 1.27 a	18.22 ± 3.77 b	21.11 ± 4.49 b
Right tibial nerve	45.25 ± 0.92 a	31.38 ± 1.36 c	35.25 ± 1.46 b
Left tibial nerve	45.57 ± 0.57 a	28.89 ± 1.51 c	35.67 ± 1.76 b

- Mean values ± S.E are presented.
- mm/s=millimeter per second
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of vitamin B-groups on nerve conduction study of motor nerve of lower limb.**Effects of vitamin B-groups on latency:**

Table 4 shows that vitamin B-groups did not significantly improve the latency of left peroneal nerve at the fibular head and right tibial nerve at the popliteal fossa in patients with DPN when compared with the control group. Vitamin B-groups demonstrated a significant improvement in the latency of right tibial nerve at the ankle and left tibial nerve at the popliteal fossa of patients with DPN when compared to the pretreated patients, but did not significantly reach the mean of control healthy group. Furthermore, vitamin B-groups showed an improvement in the latency of left peroneal nerve at the ankle and left tibial nerve at the ankle in patients with DPN, however, no significant difference was found between post-treated patients and each of healthy subjects and the pre-treated group. Moreover no significant differences were observed between the latency of control group and patients with DPN in right peroneal nerve at the ankle, right peroneal nerve at the fibular head, Table 4.

Table 4: Effects of vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)] on latency (ms) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve (ankle)	3.72 ± 0.06 a	4.26 ± 0.3 a	3.66 ± 0.23 a
Left peroneal nerve (ankle)	3.32 ± 0.12 a	4.34 ± 0.23 b	3.96 ± 0.33 ab
Right peroneal nerve (fibular head)	10.33 ± 0.17 a	10.67 ± 0.23 a	10.44 ± 0.34 a
Left peroneal nerve (fibular head)	10.05 ± 0.21 a	11.82 ± 0.27 b	10.98 ± 0.4 b
Right tibial nerve (ankle)	3.07 ± 0.11 a	4.93 ± 0.26 c	3.98 ± 0.09 b
Left tibial nerve (ankle)	3.03 ± 0.08 a	4.64 ± 0.39 b	3.91 ± 0.48 ab
Right tibial nerve (popliteal fossa)	10.22 ± 0.28 a	14.68 ± 0.64 b	13.44 ± 0.84 b
Left tibial nerve (popliteal fossa)	10.2 ± 0.2 a	13.7 ± 0.54 c	12.3 ± 0.44 b

- Mean values ± S.E are presented.
- ms= millisecond.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of vitamin B-groups on amplitude:

The effect of vitamin B-groups including vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg) on amplitude (mv) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy is shown in Table 5. Daily uses of vitamin B-groups did not significantly improve the amplitude of patients with DPN in right peroneal nerve at the ankle, left peroneal nerve at the ankle, left peroneal nerve at the fibular head, right tibial nerve at the ankle, left tibial nerve at the ankle, right tibial nerve at the popliteal fossa, left tibial nerve at the popliteal fossa when compared with the control group. Vitamin B-groups showed a significant improvement in the amplitude of right peroneal nerve at the fibular head when compared to the pretreated patients but did not significantly reach the mean of the healthy group.

Table 5: Effects of vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)] on amplitude mV of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy.

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve (ankle)	5.35 ± 0.63 a	1.46 ± 0.17 b	2.33 ± 0.36 b
Left peroneal nerve (ankle)	4.86 ± 0.24 a	1.4 ± 0.15 b	1.89 ± 0.25 b
Right peroneal nerve (fibular head)	5 ± 0.35 a	1.01 ± 0.09 c	2 ± 0.35 b
Left peroneal nerve (fibular head)	4.29 ± 0.14 a	1.61 ± 0.17 b	1.68 ± 0.27 b
Right tibial nerve (ankle)	12.85 ± 1.21 a	2.24 ± 0.29 b	4.71 ± 1.1 b
Left tibial nerve (ankle)	9.54 ± 1.33 a	2.11 ± 0.48 b	3.66 ± 0.98 b
Right tibial nerve (popliteal fossa)	9.4 ± 0.7 a	± 0.19 1.1 b	1.96 ± 0.51 b
Left tibial nerve (popliteal fossa)	7.53 ± 0.73 a	1.76 ± 0.42 b	1.83 ± 0.3 b

- Mean values ± S.E are presented.
- mV= millivolt.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of vitamin B-groups on conduction velocity:

Table 6 demonstrates that the vitamin B-groups have no significant effects in the improvement of conduction velocity in left peroneal nerve and left tibial nerve of patients with DPN when compared with the control group.

However Vitamin B-groups produced a significant improvement in the conduction velocity of right peroneal nerve when compared with the positive control subjects but did not significantly reach the mean of the healthy group. As far as the right tibial nerve is concerned, it appears that vitamin B-groups improved the conduction velocity in patients with DPN but no significant difference was established between post-treated patients and each of healthy subjects and pre-treated group.

Table 6: Effects of vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)] on conduction velocity (mm/s) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy.

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve	50.67 ± 0.92 a	36.38 ± 1.07 c	40.63 ± 1.48 b
Left peroneal nerve	50.71 ± 1.27 a	34.22 ± 3.13 b	36.78 ± 1.92 b
Right tibial nerve	45.25 ± 0.92 a	29.86 ± 4.07 b	37.43 ± 3.54 ab
Left tibial nerve	45.57 ± 0.57 a	33.14 ± 1.01 b	35 ± 1.93 b

- Mean values \pm S.E are presented.
- mm/s=millimeter per second
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of combination of pregabalin and vitamin B-groups on nerve conduction study of motor nerve of the lower limb.

Effects of pregabalin and vitamin B-groups on the latency:

Table 7 shows that there was improvement in the latency of left peroneal nerve at the ankle however it was not significant. The combined drugs did not significantly improve the latency of left peroneal nerve at the fibular head, right and left tibial nerve at the ankle, and right and left tibial nerve at the popliteal fossa in patients with DPN. No significant differences were found between the healthy group and patients with DPN concerning right peroneal nerve at the ankle and right peroneal nerve at the fibular head.

Table 7: Effects of pregabalin (75mg) and vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)] on latency (ms) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve (ankle)	3.72 \pm 0.06 A	4.12 \pm 0.53 a	4.08 \pm 0.42 a
Left peroneal nerve (ankle)	3.32 \pm 0.12 a	4.72 \pm 0.64 ab	5.47 \pm 0.49 b
Right peroneal nerve (fibular head)	10.33 \pm 0.17 a	11.52 \pm 0.95 a	11.28 \pm 0.91 a
Left peroneal nerve (fibular head)	10.05 \pm 0.21 a	13.43 \pm 0.88 b	13.22 \pm 0.82 b
Right tibial nerve (ankle)	3.07 \pm 0.11 a	4.73 \pm 0.41 b	5.27 \pm 0.47 b
Left tibial nerve (ankle)	3.03 \pm 0.08 a	5.23 \pm 0.46 b	5.22 \pm 0.54 b
Right tibial nerve (popliteal fossa)	10.22 \pm 0.28 a	17.15 \pm 0.59 b	17.18 \pm 0.56 b
Left tibial nerve (popliteal fossa)	10.2 \pm 0.2 a	13.82 \pm 1 b	14.22 \pm 0.99 b

- Mean values \pm S.E are presented.
- ms= millisecond.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of pregabalin and vitamin B-groups on the amplitude:

Table 8 shows that combination of pregabalin and vitamin B-groups induced a significant improvement in the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, right peroneal nerve at the fibular head, right tibial nerve at the popliteal fossa, and left tibial nerve at the popliteal fossa of patients with DPN when compared with the positive control subjects but did not significantly reach the mean of the control healthy group. In left peroneal nerve at the fibular head the combination of pregabalin and vitamin B-groups significantly increased the mean value of amplitude of diabetic patients. However, the combined drugs have no significant effects on the amplitude of right tibial nerve at the ankle and left tibial nerve at the ankle in patients with DPN.

Table 8: Effects of pregabalin (75mg) and vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)] on amplitude mV of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve (ankle)	5.35 ± 0.63 a	1.04 ± 0.16 c	2.99 ± 0.23 b
Left peroneal nerve (ankle)	4.86 ± 0.24 a	1.33 ± 0.17 c	3.14 ± 0.36 b
Right peroneal nerve (fibular head)	5 ± 0.35 a	2.32 ± 0.34 c	3.57 ± 0.43 b
Left peroneal nerve (fibular head)	4.29 ± 0.14 a	± 0.13 1.01 b	3.68 ± 0.39 a
Right tibial nerve (ankle)	12.85 ± 1.21 a	1.97 ± 0.54 b	3.95 ± 0.52 b
Left tibial nerve (ankle)	9.54 ± 1.33 a	1.46 ± 0.42 b	3.73 ± 0.47 b
Right tibial nerve (popliteal fossa)	9.4 ± 0.7 a	1.07 ± 0.37 c	3.42 ± 0.31 b
Left tibial nerve (popliteal fossa)	7.53 ± 0.73 a	1.41 ± 0.39 c	2.93 ± 0.29 b

- Mean values ± S.E are presented.
- mV= millivolt.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

Effects of pregabalin and vitamin B-groups on conduction velocity:

The effects of the combined drugs on the conduction velocity in DPN patients and in comparison with the healthy group are shown in Table 9. Daily administration of both pregabalin and vitamin B-groups non-significantly improved the conduction velocity of right peroneal nerve, left peroneal nerve, and right tibial nerve in DPN patients. Nonetheless the combined drugs could significantly recover the conduction velocity of left tibial nerve in DPN patients.

Table 9: Effects of pregabalin (75mg) and vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)] on conduction velocity (mm/s) of motor nerve conduction study of the lower limb in patients with diabetic peripheral neuropathy

Site	Control Healthy subjects (n=15)	Pre-treatment (n=15)	Post-treatment (n=15)
Right peroneal nerve	50.67 ± 0.92 a	24.56 ± 4.57 b	29.89 ± 3.22 b
Left peroneal nerve	50.71 ± 1.27 a	31.8 ± 3.17 b	38.1 ± 3.15 b
Right tibial nerve	45.25 ± 0.92 a	32.33 ± 1.17 b	34.83 ± 1.01 b
Left tibial nerve	45.57 ± 0.57 a	32 ± 2.46 b	40.86 ± 1.47 a

- Mean values ± S.E are presented.
- mm/s=millimeter per second
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at $p < 0.05$

The net effects of pregabalin, vitamin B-groups, and their combination on the motor nerve of the lower limb after six weeks treatment.

The net effects of pregabalin, vitamin B-groups and their combination on the latency:

The comparison of the net differences in the studied latency before and after six weeks treatment between pregabalin, vitamin B-groups, and their combination is shown in Table 10. Vitamin B-groups have significantly greater improvements in the latency of right and left tibial nerve at the popliteal fossa than that of pregabalin and combined drugs. No significant differences were found between the net effects of pregabalin, vitamin B-groups, and their combination in the latency of right peroneal nerve at the ankle, or left tibial nerve at the ankle. Both vitamin B-groups and combined drugs have significantly better effects than those of pregabalin in the latency of right peroneal nerve at the fibular head. However vitamin B-groups and pregabalin have higher affinity in reducing latency than the combined drugs of left peroneal nerve at the ankle, left peroneal nerve at the fibular head, and right tibial nerve at the ankle.

Table 10: The net differences in the studied latency (ms) before and after six weeks treatment between pregabalin (75mg), vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)], and their combination (n=45).

Site	Pregabalin	Vitamin b-groups	Combined drugs
Right peroneal nerve (ankle)	-0.37 ± 0.09 a	-0.6 ± 0.26 a	-0.03 ± 0.24 a
Left peroneal nerve (ankle)	-0.1 ± 0.43 ab	-0.39 ± 0.27 a	0.75 ± 0.27 b
Right peroneal nerve (fibular head)	-0.06 ± 0.28 a	-0.23 ± 0.29 b	-0.23 ± 0.08 b
Left peroneal nerve (fibular head)	-0.42 ± 0.15 ab	-0.83 ± 0.17 a	-0.22 ± 0.09 b
Right tibial nerve (ankle)	-0.45 ± 0.45 a	-0.96 ± 0.27 a	0.53 ± 0.09 b
Left tibial nerve (ankle)	-0.08 ± 0.21 ab	-0.73 ± 0.24 a	-0.02 ± 0.13 b
Right tibial nerve (popliteal fossa)	-0.1 ± 0.25 b	-1.23 ± 0.3 a	0.03 ± 0.08 b
Left tibial nerve (popliteal fossa)	-0.42 ± 0.11 b	-1.4 ± 0.28 a	-0.4 ± 0.17 c

- Mean values ± S.E are presented.
- ms= millisecond.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at p < 0.05

The net Effects of pregabalin, vitamin B-groups and the combination of both drugs on the amplitude:

The comparison of the net differences in the studied amplitude before and after six weeks treatment between (pregabalin, vitamin B-groups, and their combination) is shown in Table 11. The combined drugs showed significantly a greater improvement in the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, left peroneal nerve at the fibular head and right tibial nerve at the popliteal fossa in patients with DPN, than that of pregabalin and vitamin B-groups. Combined drugs and pregabalin have slightly greater affects in the amplitude of right peroneal nerve at the fibular head, right tibial nerve at the ankle, and left tibial nerve at the ankle than that of vitamin B- groups but the result was not significant. Both the combined drugs and pregabalin produced significantly greater improvements of the amplitude in left tibial nerve at the popliteal fossa than the vitamin B-groups.

Table 11: The net differences in the studied amplitude (mV) before and after six weeks treatment between pregabalin (75mg), vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)], and their combination (n=45)

Site	Pregabalin	Vitamin B groups	Combined drugs
Right peroneal nerve (ankle)	1.3 ± 0.22 ab	0.86 ± 0.31 a	1.94 ± 0.61 b
Left peroneal nerve (ankle)	1.2 ± 0.41 ab	0.49 ± 0.3 a	1.81 ± 0.34 b
Right peroneal nerve (fibular head)	± 0.46 1.02 a	0.99 ± 0.29 a	1.24 ± 0.3 a
Left peroneal nerve (fibular head)	1.59 ± 0.43 b	0.09 ± 0.18 a	2.68 ± 0.4 c
Right tibial nerve (ankle)	1.48 ± 0.98 a	0.47 ± 0.99 a	1.98 ± 0.69 a
Left tibial nerve (ankle)	1.94 ± 0.62 a	1.54 ± 0.87 a	2.24 ± 0.55 a
Right tibial nerve (popliteal fossa)	0.93 ± 0.21 a	0.66 ± 0.53 a	2.35 ± 0.42 b
Left tibial nerve (popliteal fossa)	1.92 ± 0.42 b	0.07 ± 0.65 a	1.51 ± 0.32 b

- Mean values ± S.E are presented.
- mV= millivolt.
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at p < 0.05

The net effects of pregabalin, vitamin B-groups and combination of both drugs on conduction velocity:

Table 12 shows that no significant difference were found among (pregabalin, vitamin B-groups, and their combination) on the conduction velocity of the right peroneal nerve, left peroneal nerve, and right tibial nerve. While combined drugs has shown a significantly larger improvement in the conduction velocity of the left tibial nerve than either of pregabalin and vitamin B-groups.

Table 12: The net differences in the studied conduction velocity (mm/s) before and after six weeks treatment between pregabalin (75mg), vitamin B-groups [vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg)], and their combination (n=45)

Site	Pregabalin	Vitamin B groups	Combined drugs
Right peroneal nerve	5 ± 0.97 a	4.25 ± 1.62 a	5.33 ± 1.93 a
Left peroneal nerve	2.89 ± 0.9 a	3.11 ± 1.75 a	6.3 ± 1.98 a
Right tibial nerve	3.88 ± 1.14 a	7.57 ± 4.93 a	2.5 ± 0.56 a
Left tibial nerve	6.78 ± 1.82 ab	1.86 ± 2.72 a	10.29 ± 1.74 b

- Mean values ± S.E are presented.
- mm/s= millimeter per second
- The same letters mean that there is no significant difference.
- The different letters mean there is a significant difference at p < 0.05

Effects of pregabalin on biochemical test (liver function test, renal function test, and serum malondialdehyde).**Effects of pregabalin on liver function test:**

Administration of pregabalin capsule (75mg) twice daily significantly increased the serum level of direct bilirubin ($P=0.02$) and aspartate aminotransferase ($P=0.048$). However pregabalin did not significantly change the serum level of indirect bilirubin, serum alkaline phosphates, and alanin aminotransferase Table 13.

Following six weeks of treatment with pregabalin (75 mg twice daily) there were no significant changes found in the renal function test of DPN patients. (Table 13)

Use of pregabalin for six weeks significantly increased serum level of malondialdehyde of patients with DPN (Table 13).

Table 13: Effects of pregabalin on liver function test, renal function test and malondialdehyde $\mu\text{m/l}$. n=15

Parameters	Normal value	Pre-treatment	Post-treatment
Direct bilirubin mg/100ml	0.1-0.2	0.24 \pm 0.04	0.33 \pm 0.04 *
Indirect bilirubin mg/100ml	0.2-0.4	0.33 \pm 0.08	0.35 \pm 0.06
ALP IU/L	100-290	218.67 \pm 41.57	293.33 \pm 50.57
AST U/ml	<40	21.17 \pm 2.98	24.17 \pm 3 *
ALT U/ml	<45	18.67 \pm 3.65	21.33 \pm 2.63
Blood urea mg/100ml	10-50	30 \pm 3.47	32.33 \pm 3.41
Serum creatinine mg/100ml	0.6-1.3	0.89 \pm 0.05	0.87 \pm 0.06
Serum malondialdehyde $\mu\text{m/l}$	0.1-10	12.19 \pm 2.14	14.95 \pm 2.09 *

* ($P<0.05$) when compared to control group

Discussion

The peripheral nerve in diabetic patients is characterized by progressive nerve fiber loss with pan-modal fiber size pattern (20, 21). In particular, the nerve fiber degeneration is length-dependent and conspicuous in distal portion. It has recently been shown that small fibers are preferentially affected in early stages of diabetic patients followed by the involvement of large fibers related to reduced nerve conduction velocity (22, 23). The progressive nerve fiber loss may be attributed to ongoing axonal degeneration or severe demyelination (24). The axonal loss leads to lower amplitudes, and demyelination causes prolonged latency and slow conduction velocity (25).

Effects of drug on nerve conduction study of motor nerve of lower limb:

The result of this study showed that administration of pregabalin 75mg twice daily for six weeks did not produce significant effect on the latency of nerve conduction study in patients with diabetic peripheral neuropathy.

These results support the results of Arezzo et al (2008) who reported that pregabalin 300 mg twice daily had no statistically significant effect on nerve conduction in patients with DPN (26).

The effect of pregabalin (75mg twice daily) on amplitude of NCS after six weeks were significant improvement of amplitude of right and left peroneal nerve at the ankle, left peroneal nerve at the fibular head, left tibial nerve at the popliteal fossa. This result is inconsistent with the finding of Tucker (2006) who showed that 600mg of pregabalin daily for 13 week had no clinically significant changes in the nerve conduction parameters including amplitude and conduction velocity (27). However in right peroneal nerve at the fibular head, left and right tibial nerve at the ankle and right tibial nerve at the popliteal fossa pregabalin had no significant effects on the amplitude of NCS. Hence, this part of our results is in agreement with the finding of Tucker (2006) (27).

The results of the present study showed that use of pregabalin for six weeks caused a significant improvement in the conduction velocity of right and left tibial nerve. This finding is incomparable with the study of Mathur et al (2014) as they observed that administration of pregabalin 600mg/d for 12 weeks did not produce significant effects on the amplitude and conduction velocity (28).

In this study, vitamin B-groups vitamin B1 (250mg), vitamin B6 (250mg), vitamin B12 (1mg) showed a significant improvement in latency of right tibial nerve at the ankle and left tibial nerve at the popliteal fossa after six weeks of therapy. The same dose of vitamin B groups significantly increased conduction velocity of right peroneal nerve. These improvements in the latency and conduction velocity most probably is attributed to the role of vitamin B-groups in formation and synthesis of myelin, which is the protective coating that insulates the nerve (29), also vitamin B-groups can activate chemical signals that help nerves' survival and regeneration (30, 31, 32).

However vitamin B groups could not significantly change the amplitude of NCS of right and left peroneal nerve at the ankle, left peroneal nerve at the fibular head, right and left tibial nerve at the ankle, and right and left tibial nerve at the popliteal fossa. This indicated that vitamin B groups showed no affect in the development of axon of nerve fibers (25, 29).

The results of the present study showed that the combination of pregabalin and vitamin B groups has no significant effects in improving latency of right and left peroneal nerve at the ankle and at the fibular head, right and left tibial nerve at the ankle and at the popliteal fossa and conduction velocity of right peroneal nerve, left peroneal nerve, and right tibial nerve. However the combined drugs could significantly improve the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, right peroneal nerve at the fibular head, right tibial nerve at the popliteal fossa, and left tibial nerve at the popliteal fossa, and left peroneal nerve at the fibular head. These interesting results might be attributed to medication non-adherence as reported by NCPIE (2000) which states that non-adherence can take a variety of forms, including not having a prescription filled, taking an incorrect dose, taking medication at the wrong time, forgetting to take doses, or stopping therapy too soon (33).

The net effects of pregabalin, vitamin B-groups, and their combination on the motor nerve of lower limb after six weeks treatment.

The effect of vitamin B-groups on latency of right and left tibial nerve at the popliteal fossa, right peroneal nerve at the fibular head, left peroneal nerve at the ankle, left peroneal nerve at the fibular head, and right tibial nerve at the ankle is better than the pregabalin and their combination. Vitamin B-groups' effectiveness in improving latency might be contributed to the potential role of vitamin B-groups in improving neuropathy and

maintaining the health of small nerves in lower extremities (34, 35, 36).

Combined drugs has significantly caused greater improvement in the amplitude of right peroneal nerve at the ankle, left peroneal nerve at the ankle, left peroneal nerve at the fibular head, and right tibial nerve at the popliteal fossa than that of pregabalin and vitamin B-groups, however in right peroneal nerve at the fibular head, right tibial nerve at the ankle and left tibial nerve at the ankle combined drugs have slightly greater effect on amplitude than vitamin B-groups and pregabalin but the result was deemed to be non-significant. Donger and Swami (2013) concluded that vitamin B-groups play an important role in the regeneration of the myelin sheath (37), and the pregabalin may restore the function of nerve. It is well known that vitamin B1 (thiamin) is contributed to the synthesis of neurotransmitter acetylcholine and it facilitates the conduction of nerve impulses through the peripheral nerves. Thiamin is also instrumental in producing myelin, while vitamin B12 or cobalamin is required for the manufacture of healthy myelin (29). There were no significant effects of pregabalin, vitamin B-groups and their combination found in conduction velocity.

Effect of pregabalin on biochemical test (liver function test, renal function test, and serum malondialdehyde):

In the present study, patients receiving pregabalin (75 mg twice daily) demonstrated a significant increase in the level of direct bilirubin and aspartate aminotransferase. However, pregabalin intake did not significantly change the serum level of indirect bilirubin, serum alkaline phosphates, and alanin aminotransferase. These results support the findings of (Sendra et al, 2011) who reported that administration of pregabalin 25 mg twice daily for 14 days significantly induced an elevation in liver enzymes (AST, ALT and total bilirubin) of a 54 -year old patient (38).

Following six weeks of receiving pregabalin treatment (75 mg twice daily), there was no significant change noted in the level of blood urea and serum creatinine when compared to pre-treatment levels. Hence, it can be concluded that pregabalin has no hazardous effect on the kidney functions according to the above findings.

The use of pregabalin for six weeks had significantly increased the serum level of malondialdehyde in this study. It was found by Kay et al, (2012) that pregabalin induces hypoxia and increases endothelial cell proliferation in mice, daily administration produced a significant increase in an immunohistochemical stain causing hypoxia in the liver of mice (39). The oxidative stress that occurs during cellular hypoxia is likely involved in this disorder. Indeed, the reactive species were demonstrated to inhibit active substances, modulate the signaling of intracellular pathways, and mediate enzymes activation, which are known to play a critical role in the geneses and/or the outcomes of this disorder (40)

Conclusion

Vitamin B-groups were more efficacious than the pregabalin in improving latency of patients with DPN. While combined drugs have significantly caused greater improvement in the amplitude than that of pregabalin and vitamin B-groups. However no significant differences were found between pregabalin, Vitamin B-groups, and their combination in improving the conduction velocity in patients with DPN.

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Successful use of 0.2% Glyceryl Trinitrate ointment for anal fissures in Erbil city, Iraq

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Abstract

Aim of the study: To assess the clinical efficacy of 0.2% glyceryl trinitrate ointment in the management of acute and chronic anal fissures.

Patients and Methods: A prospective clinical study conducted on consecutive patients presented to the surgical clinic of Erbil teaching Hospital, Erbil city with acute and chronic anal fissures, from June 2009 till August 2012.

These patients were treated with topical 0.2% glyceryl trinitrate (GTN) paste in soft white paraffin three times a day. Patients were examined at regular intervals to evaluate the fissure status, adverse reactions, symptomatic control and recurrence. One hundred and fifty nine patients with acute and chronic anal fissures were evaluated in the study. Fifty one of them were lost to follow-up and 108 were remaining (94.7%)

Results: At the end of complete course (6-8 weeks), pain was completely relieved in 80.9 % and partially better in 7.4%, bleeding was absent in 83.7%, anal tone became normal in 80%, and in 80.3 % had healing. The course was completed or taken for longer duration in patients 62.9%. GTN was stopped before end of the course in 40 patients (37%) due to different causes, side effects mainly headache 60 %, non compliance 95%, or no response at all 50%.

Recurrence of symptoms in the first six months was seen in 26 patients. It was seen that in two-thirds of the cases, the duration of treatment was less than 6-8 weeks. There was a highly significant positive relationship between duration of treatment and recurrence of symptoms. The recurrence was treated surgically in 53% patients, traditional ointments in 30.8% patients, and repeated GTN course in 15.4% patients.

Conclusion: The use of 0.2% GTN ointment induces rapid healing of anal fissures with an 80.3% healing rate in this study. Successful treatment may come at the expense of high incidence of headache although it is lower in our study due to lower GTN concentration.

Key words: Glyceryl trinitrate 0.2% ointment, acute and chronic anal fissures

Introduction

Anal fissure is a benign painful condition of the anoderm. Raised resting internal anal sphincter pressure is important in the pathogenesis of anal fissure, possibly by impairing tissue perfusion and leading to ischemic ulcer (1, 2, 3 4). Conservative management of the anal fissures traditionally involves stool softeners, warm sitz baths and the application of topical anesthetics. Chronic fissures tend to be more resistant to conservative management characterized by frequent recurrences (5). Surgical procedures to reduce resting anal tone for the recalcitrant fissures are effective but carry a significant risk of permanent minor impairment of continence (6, 7). Manual anal dilatation may cause irreversible, uncontrolled injury to the internal and external anal sphincters (8) with the associated incidence of fecal incontinence being 39% (9). Lateral subcutaneous internal sphincterotomy leads to successful healing of the fissure in more than 90 % of patients but temporary incontinence for the flatus or feces occurs in 0-30 % of the patients (10). Such observations have fuelled attempts to develop non-operative measures for reducing internal sphincter spasm.

Nitric oxide has emerged as one of the most important neurotransmitters mediating internal sphincter relaxation. [10] Topical glyceryl trinitrate (GTN), a nitric oxide donor produces a successful chemical sphincterotomy and improves anodermal blood flow [10]. The aim of this study was to present a more pragmatic assessment of the ultimate usefulness of GTN in the treatment of acute and chronic anal fissures.

Materials and Methods

This is an uncontrolled prospective clinical study involving one hundred and eight patients with acute and chronic anal fissure. Most of the patients had tried traditional conservative treatment (such as ointments, suppositories and laxatives) for long duration, had presence on examination of signs of chronicity (skin tag and or anal polyp), or even previous surgical intervention such as anal dilatation with recurrence of symptoms and signs, but never used GTN. These patients had full explanation about chronic fissure in ano including pathogenesis and options of treatment, mechanism of action and side effects of GTN and how to overcome or tolerate them. These patients chose to take this option as the first choice instead of other modalities such as surgery or others. Only pregnant and lactating patients were excluded from this treatment. All patients above forty years of age had barium enema or colonoscopy during their course of treatment.

The study was prospective, and was done in Erbil Teaching hospital, out patient Department and private clinic during the period from June 2007 till August 2009. The data was registered in a pre-prepared form. This form was filled in on each visit (first time GTN ointment was prescribed, end of first week, end of second week, and at 6th -8th week). Some did come regularly for the follow-up visits, others did not. Those patients who were not coming regularly received phone calls to be able to

fill out the forms. All patients had a phone call to update the data at the end of the study period (i.e August 2005). The follow up period for all the patients ranged between 4 months and 28 months.

All patients were evaluated regarding pain, bleeding, anal tone and fissure healing. Patients who stopped the treatment were evaluated for the cause. Patients who had recurrence of symptoms were evaluated regarding the duration elapsed since they finished their course and the severity of the recurrence and how it was treated. Patients who had severe recurrence (i.e similar to the presenting symptoms) were treated with anal dilatation or lateral sphincterotomy.

Glyceryl trinitrate 0.2% ointment was prescribed for three times per day for 6-8 weeks. Few patients extended their course to 12 weeks which is acceptable if needed according to the latest international literature. All patients received in addition supportive measures such as sitz baths and fiber laxatives.

Drug preparation

Glyceryl trinitrate 0.2% ointment according to the invention was prepared by admixing 5 gm of 2% by weight nitroglycerin in white petrolatum, lanolin, and distilled water with 45 gm white petrolatum in a laboratory mixing vessel at room temperature. The resulting mixture comprised 50 gm of a 0.2% nitroglycerin ointment (11).

Statistical analysis

Data were analyzed using the Statistical Package for Social Science (SPSS version 15). The chi square test of association was used for categorical variables.

Results

One-hundred and eight patients took the GTN 0.2% ointment. Almost all; 106 patients (98.1%) were males. Age ranged between 18-70 years of age, and 50 patients (46.3%) were between 30-49 years of age.

At presentation all patients were complaining of pain (100%), only 84 patients (77.8%) had bleeding, and external anal skin tag. Chronic constipation was found in 93 patients (86.1%). Spastic colon was present in 19 patients (17.6%). Two patients had ulcerative colitis disease. On examination; all patients (100%) had fissure, 104 patients (96.3%) had anal spasm, and 86 patients (79.6%) had skin tag. Almost all, 106 patients (98.1%) were treated conservatively, and only 16 patients (14.8 %) were treated surgically before GTN course. (Table 1)

The response to treatment was analyzed at first week, second week, and 6th -8th week from the start of the treatment. Pain and bleeding showed significant improvement over the 6-8 weeks period. By the sixth to eighth week the pain was absent in 55 patients (80.9%), and was reduced in 8 patients (11.8 %). This means 63 patients (92.7%) showed good response to GTN treatment. Bleeding stopped in 72 patients (83.7%), and was reduced significantly in 6 patients (7%). Total good response was seen in 78 patients (92.9%).(Tables 2, 3).

Table 1: Symptoms of acute and chronic Fissure in 108 patients.

Symptoms	Frequency	%
pain	108	100.0%
bleeding	84	77.8%
skin tag	84	77.8%
chronic constipation	93	86.1%
spastic colon	19	17.6%
presence of fissure	108	100.0%
anal spasm	104	96.3%
presence of skin tag	86	79.6%
Pre-GTN medical treatment	106	98.1%
Pre- GTN surgical treatment	16	14.8%

Table 2: History of Pain in acute and chronic fissure.

History of Pain	Absent		Reduced		Same	
	No	%	No	%	No	%
Week one	12	20%	39	65	9	15
Week two	42	57.5%	23	31.1	10	13.5
Weeks 6-8	55	80.9%	8	11.8%	5	7.4%

Pearson Chi-square: 50.5, (P<0.001)

Table 3: History of bleeding acute and chronic fissure.

History of bleeding	Absent		Reduced		Same	
	No	%	No	%	No	%
Week one	73	67.6%	21	19.4%	14	13%
Week two	83	74.8%	15	13.5%	13	11.7%
Week six	72	83.7%	6	7%	8	9.3%

Pearson Chi-square: 7.64, (P<0.105)

Regarding anal tone, it became normal in 68 patients (80.5%) and was spastic in 17 patients (20 %) at the end of the treatment course.(Table 4) Fissures were also evaluated regarding signs of healing, where 80.3% were either healed or showing signs of healing. (Table 5).

Table 4: Anal tone in acute and chronic fissure of 108 patients.

Anal tone	Normal		Spastic	
	No	%	No	%
Week One	38	34.2%	73	65.8%
Week two	79	71.8%	31	28.2%
Week six	68	80%	17	20%

Pearson Chi-square: 51.44 (P<0.001)

Table 5: Healing efficacy of GTN in 108 patients with acute and chronic fissure.

Healing fissure	Not healed		Healing	
	No	%	No	%
Week One	34	37.4%	57	62.6%
Week two	35	32.1%	74	67.9%
Week six	14	19.7%	57	80.3%

Pearson Chi-square: 6.003 (P<0.05)

The duration of treatment ranged between 1 week and 28 weeks. Forty nine patients took the course for 6-8 weeks (45.3%) and 19 patients (17.6%) took the treatment more than 8 weeks and up to 20 weeks. (Table 6) This indicates that 68 patients (62.9%) did not stop the treatment and finished the course within 6-8 weeks.

Table 6: Duration of treatment with GTN in 108 patients with acute and chronic fissure.

	Frequency	Percent
1 - 5 weeks	40	37.0%
6 - 8 weeks	49	45.3%
> 8 weeks	19	17.6%

The duration of follow-up was less than six months in 24 patients (22.2%), six to twelve months in 23 patients (20.4%), and more than 12 months in 64 patients (57.4%). This indicates that almost half of our patients had follow-up for more than one year and more than two-thirds for 6 to 12 months (Table 7).

Table 7: Duration of follow-up in months in 108 patients with acute and chronic fissure treated with GTN 0.2%

	Frequency	Percent
< 6 months	24	22.2
6 - 12 months	23	20.4
> 12 months	64	57.4

The patients who stopped the GTN course early (40 patients), had multifactorial causes which were evaluated; such as side effects (mainly headache) in 25 patients (60%), noncompliance to dose, frequency or the drug finished before the end of the course in 39 patients (95%), and patients who claim no response to GTN course were 21 patients (50%) (Table 8).

Table 8: Causes of stopping treatment with GTN 0.2% in patients with acute and Chronic fissure

Causes	Count	Percent*
Side effects (headache)	25	60.0%
Non compliance	39	95.0%
No response	21	50.0%

* The percent was calculated from those who stopped treatment (20 patients)

There were 47 patients who had recurrence of symptoms within six months after finishing or stopping the course. The symptoms were either mild or severe. There was a significant strong relationship between recurrence of symptoms and the duration of treatment; the symptoms recurred in a shorter period if the treatment was taken for a shorter course, particularly if it was taken for less than a 6-8 weeks period (Table 9).

The severity of recurrence in these patients was mild in 18 patients (46.2%) and was treated either with traditional ointment or repeated GTN course and was severe in 29 patients (53.8%) and was treated surgically by anal dilatation.

Table 9: Treatment of recurrence in relation to severity

Type	Mild		Severe	
	No	%	No	%
Surgical	0	0%	29	53.8%
Repeat GTN	9	15.4%	0	0%
Using traditional ointments	9	30.8%	0	0%

Pearson Chi-square: 47 (P<0.001)

The percent was calculated from the patients who had recurrence within 6 months (26 patients).

Discussion

The present clinical trial establishes the clinical efficacy of 0.2% GTN ointment in the treatment of anal fissures. The published data of a high cure rate of 70-80% in various studies [3,6] with a paucity of significant side effects are encouraging. Topical GTN ointment is an effective alternative to surgery in the treatment of chronic fissure in ano(8). Preparations of 0.2% GTN ointment is probably the most widely used first line treatment in the UK with successful results (3), but many patients experience troublesome headaches on this therapy. The ointment is applied 2-3 times daily to the distal anal canal for up to 8 weeks but in some should be used up to 12 weeks for the fissure to heal.

In our study the chronic fissure in ano was either healed or healing in 80.3% in the 6-8 weeks period. The healing rate in 4-8 weeks course in other studies was 71% with 0.5% concentration (1), 67%, 65%, 62.5%, and 84% with 0.2% concentration (2, 3, 5,). There were other studies which showed no difference in healing rates between 0.2% and higher concentrations (6). Other studies have also concluded that two-thirds of their patients will heal, but over one-half will develop headaches as side effects of the treatment (3). The headache is usually mild, transient and tolerable, often diminishing in intensity

and duration with continued application (3,6). In some cases the headache may be sufficiently severe to reduce compliance or lead to cessation of treatment. One article claimed that better outcome was seen with the use of higher concentration (72% with 0.5% vs 64% with 0.2%). (1) This benefit, however, occurs at the expense of more headache and lower compliance rate. In our study the healing rate was high with only 0.2% concentration and non-compliance and headache were studied and found significantly high in patients who stopped their course of treatment before 6-8 weeks. What remains unclear in all published series is whether headaches are in part due to absorption of GTN via the finger, given that not all patients use gloves while applying the medication. Furthermore, given the absence of a reliable dosage system, the actual quantity may be different in each patient.(1)

An uncontrolled prospective observational study looked at the use of isosorbide dinitrate spray in the treatment of anal fissures.(2) In 81 patients studied, symptoms had been present for two to 120 months with classical signs of chronicity present in only 61% of cases. All the patients had failed to heal after three weeks of conservative management. In this group of patients, isosorbide dinitrate 1.25 or 2.5 mg (one or two sprays) applied three

times a day for four weeks produced healing in 83% of patients at four months. There was an 18% relapse rate after a mean follow-up of 11 months, all of which were successfully treated with a further four week course. Headaches occurred in 19.5%.

In general, most studies report healing in the majority of cases within eight weeks of treatment (1, 3, 4 & 7). In one article a review through the Pub Med (1996-May 2003) and Cochrane Library (May 2003) for all reports that compared non-surgical therapy with surgery, showed that GTN had higher healing rates than placebo (11 trials). This also showed that GTN had lower healing rates than sphincterotomy (4 trials) but did not differ for minor incontinence. GTN did not differ from botulinum toxin injection (botox) (2 trials) or calcium channel blockers (1 trial) (9).

The duration of treatment in our patients ranged between one week and 28 weeks. About 62.9% took the treatment for 6-8 weeks or more.

Early recurrence (less than 6 months) has occurred in 48% of patients. It does not appear to be a problem as it was mild in almost half and was treated conservatively either with traditional ointments or repeated GTN course. The recurrence was severe in 29 patients only and these were the ones who needed surgical treatment. In our results we found a significant strong relationship between the duration of treatment and duration of recurrence. This indicated that prolonged courses of treatment 8-12 weeks or more had better results and longer periods of free of symptoms.

Other series showed that fissures which initially healed on GTN will recur within 12 months but respond to further courses of GTN (6).

From our results and other studies we conclude that less than eight weeks of treatment with topical GTN is likely to be unsuccessful in truly chronic fissures as it takes chronic fissures eight weeks to heal; indeed some fissures may only partially heal within eight weeks but will fully heal if treated longer (6).

The duration of follow-up of our patients was significantly high which was not found in some other studies. (1,2)

Conclusion

GTN is a useful therapeutic modality in the management of acute and chronic anal fissures, with an 80.3% healing rate in this study, which are refractory to dietary modifications, fiber supplements and sitz baths. As GTN is safe and effective we suggest performing a randomized comparative study with surgical gold standard treatment.

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Patient's Satisfaction: Insight into Access to Service, Interpersonal Communication and Quality of Care Issues

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Abstract

Objective: To assess patient satisfaction and expectations from the family medicine department at a newly established public sector hospital in Riyadh.

Methodology: A cross sectional study. Pre tested, pre designed, well structured questionnaire written in English with Arabic translation was administered to randomly selected volunteer patients, who presented to family medicine clinics of a tertiary care hospital from February to March 2014. A total of 148 anonymously completed questionnaires were returned to the investigator. Data were analyzed using SPSS-21 and the results expressed as counts and percentages.

Results: The overall level of patient satisfaction on a Likert scale from 1 to 5 was indicated by a mean score of 3.84 ± 1.27 for pre-consultation process and 4.63 ± 0.75 for process of consultation by family physicians. The highest satisfaction was with family physicians who clearly explained what is wrong before giving any treatment (4.72 mean points) and the lowest for availability of reading material in the waiting room (2.93 mean points).

Conclusion: Consultation by family physicians followed by nursing services were highly satisfactory whereas the satisfaction score and written comments of some of the participants reflected a need to improve some infrastructure and administrative aspects.

Key words: Patient's satisfaction, Likert Scale, Family Medicine, Primary Care

Introduction

Patient satisfaction is deemed to be one of the important factors which determine the success of a health care facility and has long been considered as an important component when measuring health outcomes and quality of care (1-4). Health care consumers today, are more sophisticated than in the past and now demand increasingly more accurate and valid evidence of health plan quality. Hence, basic to the success of any practice is to satisfy patients by thoroughly understanding their needs, which definitely can make a big impact on the service and improves the overall quality of care (5-9).

Patient satisfaction survey is an effective tool to either design a new practice plan or to improve a practice plan in which stakeholders are already participating (10).

Studies have shown, that patient satisfaction is directly related to adherence with the pharmaceutical and non pharmaceutical advice; it improves trust and loyalty and decreases the number of lawsuits (11, 12).

A well established process to measure client satisfaction is by a survey, which is usually performed by using a short and easily administered questionnaire, that provides information and insight on patients' views of the services they receive (13).

We conducted this study due to the increasingly competitive environmental and global trend in healthcare development towards integrating client satisfaction into the evaluation of medical service quality. The Family Medicine Department at Prince Mohammad Bin Abdulaziz hospital (PMAH) is considered to act as a gatekeeper of treatment for patients. Thereby, Family Medicine must achieve customer satisfaction by providing quality services. This study was therefore undertaken with the aim to find out the level of patient satisfaction related to different parameters of quality of health.

Subjects and Methods

This cross sectional study was conducted among patients of Prince Mohammad Bin AbdulAziz Hospital (PMAH) during their visit to the family medicine clinics. PMAH is a community based tertiary care hospital with 500 beds. This hospital serves the referral patients from 21 public primary health care centers of Riyadh. The study was conducted from February to March, 2014 to assess the patient's satisfaction related to the service being provided at family medicine clinics at PMAH. A systematic randomized sampling technique was used to select the participants irrespective of their gender, nationality, age, marital status, educational level or Bio-Psycho-Social status. A pre tested, pre designed well structured questionnaire containing open-ended and close-ended questions written in English with Arabic translation, was administered to every 5th volunteer patient, during working hours i.e. 8:00 Am - 4:00 Pm from Saturday to Wednesday. The covering letter of the questionnaire outlined the title and the purpose of the study and the identity of the researcher. Participants

were informed about the importance of the study and were encouraged to participate. The questionnaire was divided into various sections with 26 items to highlight the most important issues related to the quality of care, accessibility to the service and interpersonal attitude and etiquette. Closed question responses requested for items were in a 5-point Likert scale, ranging from 'poor =1' to 'excellent = 5'. In a section at the end of the survey questionnaire, comments/suggestions were requested from the participants to improve the quality of service. Various steps were taken to increase the content validity of the questionnaire. Firstly, a comprehensive review of the relevant literature was carried out. Secondly, a pilot survey of 30 participants was conducted and on the basis of that a few questions were reformed, added or deleted. Lastly, all participants were informed and assured about the issue of anonymity and no identifying information was included in the questionnaire. The pilot survey questionnaires were not included in the main survey. The data for this study were collected by staff nurses working in the primary care clinics of PMAH.

Statistical Analysis

The Likert scale was used in this survey research. It is often used to measure respondents' attitudes by asking the extent to which they agree or disagree with a particular question or statement. A typical scale of "poor, fair, good, very good and excellent" was used. Data was entered into a spread sheet and processed on Statistical Package for Social Sciences-21 (SPSS-21). Demographic data and answers to the questions in the questionnaire were analyzed in a descriptive fashion. Results were expressed as counts and percentages. When necessary, data were also presented in Mean \pm SD.

Results

Out of 200 administered questionnaires, one hundred and forty eight (74%) anonymously completed questionnaires were returned to the investigator. Fifty seven respondents were men and 91 women.

The mean age of respondents was 37.40 ± 14.87 years.

The majority of the respondents refused to answer their educational and job status. Participants, who responded were university level education (31.8%) and were professionals (20.9%).

The questionnaire was divided into two main parts:
A). PRE-CONSULTATION PROCESS AND AVAILABLE FACILITIES,
B). CONSULTATION PROCESS.

When items of Likert scale for areas of satisfaction were recorded, the mean and standard deviation for overall level of satisfaction was 3.84 ± 1.27 for pre-consultation process and 4.63 ± 0.75 for process of consultation by family physicians.

Table 1: Demographic Details Of Participants

Age	37.40 ± 14.87 years
Gender	
Men	57 (38.5 %)
Women	91 (61.5 %)
EDUCATION	
No response	59 (39.9%)
Illiterate	04 (2.7%)
Primary	06 (4.1%)
Secondary	21 (14.2%)
College	11 (7.4%)
University	47 (31.8%)
JOB	
No response	62 (41.9%)
House wife	14 (9.5%)
Student	17 (11.5%)
Retired	07 (4.7%)
Jobless	02 (1.4%)
Managerial	06 (4.1%)
Professional	31 (20.9%)
Technician & associate professionals	04 (2.7%)
Service & sales worker	02 (1.4%)
Skilled agricultural, forestry and fishery worker	01 (0.7%)
Plant and machine operator and assemblers	02 (1.4%)

The respondents reported their highest level of satisfaction with the quality of the services provided by doctors followed by registered nurses. The lowest level of satisfaction was for access to medical care, waiting time, appointment time and comfort of waiting room.

Table 2A presents the results of the pre consultation process and available facilities. The main area of less satisfaction were enough reading material in waiting room, waiting time, pleasant environment of waiting room and to get an appointment at a convenient time. Most of the patients were satisfied with the nurses who listened to them carefully and addressed their concerns carefully. Their response also showed that nurses were very reassuring.

Table 2B (page 22) presents data for consultation process. Patients were satisfied with all the attributes of consultants. Mean response was greater than 4.5 out of 5 for all the questions.

Discussion

Consumer's satisfaction is generally considered as the extent to which the consumers feel that their needs and expectations are being met by the services provided. Patients usually express their views through complaints procedures (12), changing doctors (14) and by expressing their opinion on the quality of services received (15).

In our study, the overall level of patient satisfaction with the services before consultation, on an ascending scale from 1 to 5, was indicated by a mean score of 3.84 implying that, in general, they perceived that the quality of the healthcare services before consultation were relatively moderate. They were not entirely dissatisfied with the quality of the services, but they were not entirely satisfied. On the other hand, patients were highly satisfied with all the attributes of consultation by family physicians (mean score 4.63). The findings of this study

related to patient satisfaction are comparable to a similar study from Kuwait (16), Egypt (17) and Nigeria (18). Patients are more satisfied in our study compared with the studies from Hail and Jeddah cities, where the mean score was 3.60 and 3.76 (7, 19).

Physician's good communication skill is a well recognized key component of patient satisfaction (20-22). Based on the results of this study, almost all patients reported a high level of satisfaction with various aspects of family physician's consultation. The most likely explanation for this positive finding could be the excellent communication skills of the family physician. Respondents in the current survey also reported the highest level of satisfaction for the friendliness, courtesy, personal interest, reassurance, respect, support and time offered to the patients by the physicians.

Table 2A: Patient's Satisfaction with Family Medicine Department, PMAH

<i>Characteristics</i>	<i>Poor</i> <i>(1)</i>	<i>Fair</i> <i>(2)</i>	<i>Good</i> <i>(3)</i>	<i>Very good</i> <i>(4)</i>	<i>Excellent</i> <i>(5)</i>	<i>Mean ± SD</i>
PRE-CONSULTATION PROCESS AND AVAILABLE FACILITIES						
Easy to get an appointment	12 (8.12)	13 (8.81)	24 (16.2)	27 (18.2)	72 (48.6)	3.91±1.32
Easy to see a doctor of choice	10 (6.8)	14 (9.5)	34 (23)	22 (14.9)	68 (45.9)	3.84±1.29
Easy to get an appointment at a convenient time	14 (9.5)	12 (8.1)	31 (20.9)	22 (14.9)	69 (46.6)	3.81±1.35
Pleasant environment of waiting room	14 (9.5)	13 (8.8)	27 (18.2)	34 (23)	60 (40.5)	3.76±1.32
Enough seats in waiting room	7 (4.7)	16 (10.8)	20 (13.5)	22 (14.9)	83 (56.1)	4.07±1.25
Enough reading material in waiting room	47 (31.8)	16 (10.8)	23 (15.5)	24 (16.2)	38 (25.7)	2.93±1.61
Waiting time was satisfactory	21 (14.2)	27 (18.2)	25 (16.9)	32 (21.6)	43 (29.1)	3.33±1.43
Receptionists treated me with patience and understanding	7 (4.7)	9 (6.1)	26 (17.6)	24 (16.2)	82 (55.4)	4.11±1.18
Nurses listened carefully	3 (2)	10 (6.8)	24 (16.2)	35 (23.6)	76 (51.4)	4.16±1.05
Nurses were very reassuring	4 (2.7)	10 (6.8)	24 (16.2)	30 (20.3)	80 (54.1)	4.16±1.09
Nurses answered all questions	3 (2)	15 (10.1)	23 (15.5)	27 (18.2)	80 (54.1)	4.12±1.13
Overall mean ± SD						3.84 ± 1.27

Table 2B: Patient's Satisfaction with Family Medicine Department, PMAH (Part A)

<i>Characteristics</i>	<i>Poor</i> <i>(1)</i>	<i>Fair</i> <i>(2)</i>	<i>Good</i> <i>(3)</i>	<i>Very good</i> <i>(4)</i>	<i>Excellent</i> <i>(5)</i>	<i>Mean ± SD</i>
CONSULTATION PROCESS						
I felt confident discussing problems with the doctor	2 (1.4)	1 (0.7)	12 (8.1)	24 (16.2)	109 (73.6)	4.60±0.78
Doctor showed a genuine interest in my problem	1 (0.7)	3 (2)	7 (4.7)	21 (14.2)	116 (78.4)	4.68±0.72
Doctor did not feel rush during consultation	4 (2.7)	5 (3.4)	13 (8.8)	25 (16.9)	101 (68.2)	4.45±0.98
Doctor was very careful to check everything important	1 (0.7)	4 (2.7)	12 (8.1)	22 (14.9)	109 (73.6)	4.58±0.81
Doctor treated me in a very friendly and courteous manner	0(0)	1 (0.7)	10 (6.8)	20 (13.5)	117 (79.1)	4.71±0.62
Doctor clearly explained what is wrong before giving any treatment	1 (0.7)	1 (0.7)	10 (6.8)	15 (10.1)	121 (81.8)	4.72±0.68
Doctor explained at the level of my understanding	0(0)	1 (0.7)	11 (7.4)	26 (17.6)	110 (74.3)	4.66±0.65
Doctor requested necessary tests and explained them to me	1 (0.7)	0(0)	11 (7.4)	22 (14.9)	114 (77.0)	4.68±0.67
Doctor gave me good advice and treatment	1 (0.7)	1 (0.7)	12 (8.1)	18 (12.2)	116 (78.4)	4.67±0.71
Doctor took care of my privacy and confidentiality	1 (0.7)	2 (1.4)	11 (7.4)	23 (15.5)	111 (75.0)	4.63±0.74
Doctor respected my cultural and religious norms	2 (1.4)	0(0)	10 (6.8)	21 (14.2)	115 (77.7)	4.67±0.72

Table 2B: Patient’s Satisfaction with Family Medicine Department, PMAH (Part B)

I think my doctor is competent and well trained	2 (1.4)	1 (0.7)	8 (5.4)	24 (16.2)	113 (76.4)	4.66±0.74
I have confidence in my doctor	2 (1.4)	1 (0.7)	11 (7.4)	25 (16.9)	109 (73.6)	4.61±0.77
I am satisfied with the medical care I received	2 (1.4)	4 (2.7)	11 (7.4)	27 (18.2)	104 (70.3)	4.53±0.85
I am satisfied with the consultation time	2 (1.4)	1 (0.7)	10 (6.8)	27 (18.2)	108 (73.0)	4.61±0.76
Overall mean ± SD 4.63 ± 0.75						

Waiting time and waiting room facilities directly influence the satisfaction of patients (10). In our study, patients were least satisfied with waiting time and availability of facilities in the waiting room. Findings of this study are comparable with the study from United States in which longer waiting times were associated with lower patient satisfaction ($p < 0.05$) (23). In another study, availability of a video in waiting room significantly increased the satisfaction score (24).

Some limitations should be considered when evaluating this study. Relatively small sample size, not interviewing patients directly and limiting the study to one institute may influence negatively towards the generalizability of the results. Patient’s satisfaction alone, is not an appropriate indicator to make favorable comments on quality of primary health care services. Therefore, there is a need to assess and evaluate other indicators of quality in depth, like error rate, patient’s complaints, lawsuits, physician’s documentation, etc. However, the significantly high level of patient’s satisfaction, related to various areas which were assessed, justifies a degree of generalizability.

Conclusion

Patient satisfaction is an increasingly important issue, both in evaluation and the shaping of health care. The findings from this study showed that the overall satisfaction with services at the family medicine clinics of a tertiary care hospital (PMAH) was above average, however, we observed varying degrees of dissatisfaction with some services. The results of this study will support policy and decision makers to make better plans to address the attributes falling under satisfaction.

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“Health Education Epidemiology”: An interdisciplinary science that comes into being through the integration of epidemiology and health education

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Introduction

Epidemiology, as the science of studying the patterns and the causes of health-related phenomena in human societies could provide evidence on how the health of a society can be shaped by diverse factors. Over time epidemiologists have established various study methods e.g. cross-sectional, case-control, cohort, clinical trial, etc. in order to study diverse public health issues.

As a result of applying these designs they have produced a lot of jargon. To name a few, we can refer to risk, rate, point prevalence, period prevalence, sensitivity, specificity, cumulative incidence, incidence density rate, odds ratio, relative risk, confounder, bias, potential effects of exposure, etc.

By using all these methods and related jargon epidemiologists are able to quantify the relation between exposure and outcome, or even to highlight if we are able to reduce the current exposure to a defined level, what would be the potential impact of this reduction either in the exposed group or the whole population.

Nevertheless, these methods and their related terminology are only useful for epidemiologists and other public health specialists who are familiar with them. When it comes to the public and when communicating the results of an epidemiological study to the lay people we should translate this jargon into ordinary language which they would be better able to relate to.

How we could translate methods and jargon into a comprehensible language

For conducting this critical and highly important step, there are other scientists who could assist epidemiologists. These are health educators (or public health officials) whose job is to help people change their attitude and behaviors to restore their full health. Public health officials could also base their initiatives on epidemiological data. These scientists translate the results of new findings, including epidemiological findings, into a language which is comprehended by the lay people, as well as, hopefully, a system of public health based on those findings. Further, epidemiology allows for the assessment of health education and public health initiatives.

Abstract

By integrating epidemiological techniques with health education techniques, we could witness the birth of a new interdisciplinary branch of science that we could call “Health Education Epidemiology”. This new branch of science will greatly assist in the promotion of health of all human societies. This article aims at initiating such integration.

Key words: Epidemiology, Health Education, Integration

Scientists or public health officials disseminate this new knowledge through appropriate media, including mass media, in order to reach the highest coverage as possible. They apply various communication techniques to pass on the knowledge in a way that influences the attitude of people. By influencing the attitudes of the people it is possible that they adopt a new behavior which improves their health.

Sometimes the health-related problem is too crucial or its consequences might be too immense. Besides it might be possible that people become accustomed to it and as a result it would be very difficult to change the situation. Therefore, we need to mobilize the community by the means of social campaigns.

An outstanding example might be the act of self-immolation or self-burning especially in developing countries. Under such circumstances the health educationists could help to organize social campaigns in order to prevent this destructive behavior. They could also help to initiate media advocacy which is fundamental in such public health campaigns.

A reciprocal relation

However, it should be noted that the relation between epidemiologists and health educators is not a one-way relationship. On the contrary, epidemiologists would also be able to help health educators to measure how successful their translations and/or social campaigns would be and have been.

Choosing a suitable study design, selecting an appropriate number of samples, recruiting those samples in a scientific and proper way, designing an appropriate method for measuring the impact of education and/or campaigns, carrying out the appropriate statistical analyses, etc. are to name just a few of skills that epidemiologists could provide for the health educators.

Conclusion

Epidemiological studies can provide evidence on how the health of human communities is shaped by the role of diverse factors. However, the science is full of methods and related jargon which make it very difficult to communicate new results to lay people.

Health education is a discipline that would translate any findings including epidemiological ones into a language which is comprehended by lay people. The diverse methods applied by health educators could help to disseminate new knowledge into appropriate audiences. This makes it possible that eventually a new healthy behavior will emerge.

However, to assess the success of such translations and interventions we still do need epidemiological techniques. The integration between these two disciplines is inevitable and could give birth to a new interdisciplinary branch of science that we could name as “Health Education Epidemiology”.

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Iraqi girl's education: challenges and opportunities

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The girls in the photo say; 'I want to become an attorney and be an important person'; 'I want to become a teacher'; 'I keep coming to school because I am a top performer and I want to finish my education'; 'I like to go to school and learn'; 'I want to learn how to read and write.'

To Whom Is Concerned!

A coalition to fight ISIS has been launched; again this is another open war with no time table, and the battlefield is Iraq, the world's favoured weapon trials laboratory on the experimental models Iraqis by the justificatory rhetoric of war (collateral damage!).

"What hypocrisy when some people grow 'indignant' because one or two of their citizens are killed".

War has been described as 'development in reverse'. Even short episodes of armed conflict can halt progress or reverse gains built up over generations, undermining economic growth and advances in health, nutrition and employment. The impact is most severe and protracted in countries and among people whose resilience and capacity for recovery are weakened by mass poverty. Education seldom figures in assessments of the damage

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War has been described as 'development in reverse'. Even short episodes of armed conflict can halt progress or reverse gains built up over generations, undermining economic growth and advances in health, nutrition and employment. The impact is most severe and protracted in countries and among people whose resilience and capacity for recovery are weakened by mass poverty. Education seldom figures in assessments of the damage inflicted by conflict. International attention and media reporting invariably focus on the most immediate images of humanitarian suffering, not on the hidden costs and lasting legacies of violence. Yet nowhere are those costs and legacies more evident than in education. Across many of the world's poorest countries, armed conflict is destroying not just school infrastructure, but also the hopes and ambitions of a whole generation of children. Education is seldom a primary cause of conflict. Intra-state armed conflict is often associated with grievances and perceived injustices linked to identity, faith, ethnicity and region. Education can make a difference in all these areas, tipping the balance in favour of peace -or conflict. When the political leaders do acknowledge the need to tackle literacy, (allow Iraqis to extend their knowledge through free fellowships in the developed countries) only then they will guarantee winning the war.

History

All the available data and available published information make it clear that Iraq's women, once a highly educated group, have lost ground in the last 15 -20 years as girls' participation in education has declined. A good quality educational system, which includes and encourages the full participation of girls, is vital for any country's development. The full participation of girls is needed not only because of the value of the contribution that women are then able to make in social, economic and political spheres, but because of the well documented benefit that the educational level of the wife and mother in a family makes to the health, well-being and success in life of all family members. The value of providing good education for all children is even greater in the case of Iraq because of the immense development tasks facing the country. However the available information suggests that educational disadvantage is increasing for Iraqi girls as they are disproportionately less likely to participate and succeed in education at every age and every level. Half the future of the country is being wasted. Educational disadvantage for girls in Iraq has complex causes. It is inextricably linked with the status of women in Iraqi

society and with the opportunities available to women in the workplace and in public life, as well as with social conditions such as poverty, security and the quality of educational provision.

Although historically Iraqi women and girls had relatively more rights than many of their counterparts in the Middle East, major discrepancies have always existed between rich and poor, urban and rural, traditional and liberal families with regard to the education of girls. The Iraqi Provisional Constitution (drafted in 1970) formally guaranteed equal rights to women and other laws specifically ensured their right to vote, attend school, run for political office, and own property. Since the 1991 Gulf War, the position of women within Iraqi society has deteriorated rapidly, with the predictable impact on girls' education. Women and girls were disproportionately affected by the economic consequences of the U.N. sanctions, and lacked access to food, health care, as well as education. These effects were compounded by changes in the law that restricted women's mobility and access to the formal sector in an effort to ensure jobs to men and appease conservative religious and tribal groups.

After seizing power in 1968, the secular Ba'ath party embarked on a programme to consolidate its authority and to achieve rapid economic growth despite labour shortages. Women's participation was integral to the attainment of both of these goals, and the government passed laws specifically aimed at improving the status of women. The status of Iraqi women was directly linked to the government's over-arching political and economic policies. Until the 1990s, Iraqi women played an active role in the political and economic development of Iraq. A robust civil society had existed prior to the coup d'état in 1968, including a number of women's organizations. The Ba'ath Party dismantled most of these civil society groups after its seizure of power. Shortly thereafter it established the General Federation of Iraqi Women. The General Federation of Iraqi Women played a significant role in implementing state policy, primarily through its role in running more than 250 rural and urban community centers offering job-training, educational, and other social programmes for women and acting as a channel for communication of state propaganda. Female officers within the General Federation of Iraqi Women also played a role in the implementation of legal reforms advancing women's status under the law and in lobbying for changes to the personal status code.

The primary legal underpinning of women's equality was set out in the Iraqi Provisional Constitution, which was drafted by the Ba'ath party in 1970. Article 19 declares all citizens equal before the law regardless of sex, blood, language, social origin, or religion. In January 1971, Iraq also ratified the International Covenants on Civil and Political Rights and Economic, Social and Cultural Rights which provide equal protection under international law to all.

In order to further its programme of economic development, the government passed a compulsory education law mandating that both sexes attend school at the primary level. The Compulsory Education Law 118/1976 stated that education is compulsory and free of charge for children of both sexes from six to ten years of age. Girls were free to leave school thereafter with the approval of their parents or guardians. Although middle and upper class Iraqi women had been attending university since the 1920s, rural women and girls were largely uneducated until this time. In December 1979, the government passed further legislation requiring the eradication of illiteracy. All illiterate persons between ages fifteen and forty-five were required to attend classes at local "literacy centers," many of which were run by the General Federation of Iraqi Women (GFIW). Although many conservative sectors of Iraqi society refused to allow women in their communities to go to such centers (despite potential prosecution), the literacy gap between males and females narrowed. The Iraqi government also passed labour and employment laws to ensure that women were granted equal opportunities in the civil service sector, maternity benefits, and freedom from harassment in the workplace. Such laws had a direct impact on the number of women in the workforce. The fact that the government was hiring women contributed to the breakdown of the traditional reluctance to allow women to work outside the home. The Iraqi Bureau of Statistics reported that in 1976, women constituted approximately 38.5 percent of those in the education profession, 31 percent of the medical profession, 25 percent of lab technicians, 15 percent of accountants and 15 percent of civil servants.

During the Iran-Iraq war (1980-88), women assumed greater roles in the workforce in general and the civil service in particular, reflecting the shortage of working age men. Until the 1990s, the number of women working outside the home continued to grow.

Legislative reforms in this period reflected the Ba'ath Party's attempt to modernize Iraqi society and supplant loyalty to extended families and tribal society with loyalty to the government and ruling party. In the years following the 1991 Gulf War, many of the positive steps that had been taken to advance women's and girls' status in Iraqi society were reversed because of a combination of legal, economic, and political factors. The most significant political factor was Saddam Hussein's decision to embrace Islamic and tribal traditions as a political tool in order to consolidate power. In addition, the U.N. sanctions imposed after the war have had a disproportionate impact on women and children, especially girls. The gender gap in school enrolment (and subsequently female illiteracy) increased dramatically due to families' financial inability to send their children to school. When faced with limited resources, many families chose to keep their girl children at home. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), as a result of the national literacy campaign, as of 1987 approximately 75 percent

of Iraqi women were literate; however, by year-end 2000, Iraq had the lowest regional adult literacy levels, with the percentage of literate women at less than 25 percent.

Women and girls have also suffered from increasing restrictions on their freedom of mobility and protections under the law, which again predictably impact on the access of girls to education. In collusion with conservative religious groups and tribal leaders, the government issued numerous decrees and introduced legislation which had a negative impact on women's legal status in the labour code, criminal justice system, and personal status laws. In 2001, the U.N. Special Rapporteur for Violence against Women reported that since the passage of the reforms in 1991, an estimated 4,000 women and girls had been victims of so called "honour killings."

Additionally, as the economy constricted, in an effort to ensure employment for men the government pushed women out of the labour force and into more traditional roles in the home, so that the education of girls became less significant as they were unlikely to work outside the home. In 1998, the government reportedly dismissed all women working as secretaries in governmental agencies. In June 2000, it also reportedly enacted a law requiring all state ministries to put restrictions on women working outside the home. Women's freedom to travel abroad was also legally restricted and formerly co-educational high schools were required by law to provide single-sex education only, further reflecting the reversion to religious and tribal traditions. As a result of these combined forces, by the last years of Saddam Hussein's government the majority of women and girls had been relegated to traditional roles within the home and the education of girls had, predictably declined still further. By 2000, budget constraints were also seriously limiting the provision of textbooks and other teaching and learning materials. Less money was available to rehabilitate dilapidated school so children were increasingly unable to study in properly functioning school buildings. The war begun in 2003 further contributed to the decline in the quality of education with the greatest impact on the education of girls with an increase in both real and perceived levels of danger outside the home, declining quality teaching and an increase of religious conservatism in some parts of the country.

Currently, despite some positive achievements in northern and southern Iraq, ongoing violence is posing new challenges in the country's central zone. In an insecure atmosphere where schools have been targeted, many parents have to choose between education and safety for their children, with girls once again the most affected.

When wars break out, international attention and media reporting invariably focus on the most immediate images of human suffering. Yet behind these images is a hidden crisis. Across many of the world's poorest countries, armed conflict is destroying not just school infrastructure, but the hopes and ambitions of generations of children.

Half of them are girls. The hidden crisis in education in conflict-affected states is a global challenge that demands an international response. As well as undermining prospects for boosting economic growth, reducing poverty and achieving the Millennium Development Goals, armed conflict is reinforcing the inequalities, desperation and grievances that trap countries in cycles of violence.

Displaced populations are among the least visible

Mass displacement is often a strategic goal for armed groups seeking to separate populations or undermine the livelihoods of specific groups. At least 500 000 people in Mosul have been displaced, according to the International Organization for Migration (IOM). 100 000 of these people are being hosted in Kirkuk, Erbil, Duhawk and Sulaimanya, while 200 000 people who were not able to pass through border checkpoints remain located in disputed areas adjacent to the Kurdish border. A further 200 000 people have been displaced from the west to the east side of Mosul. An additional 470 000 people were displaced earlier by fighting between the Iraqi army and armed opposition groups who have controlled the cities of Ramadi and Fallujah since January. The new flood of displaced people from Mosul almost doubled Iraq's internally displaced persons caseload in less than 1 week and "created an alarming environment in Iraq", though the real number is almost certainly higher. Recent estimates suggest that almost half of refugees and internally displaced people (IDPs) are under 18. Many do not have the documents. Gender parity in education is a fundamental human right, a foundation for equal opportunity and a source of economic growth, employment and innovation. Gender disparities originate at different points in the education system. Tackling gender disparities in secondary school poses many challenges. Some of the barriers to gender parity at the primary level are even higher at the secondary level. Secondary schooling is far more costly, often forcing households to ration resources among children. Where girls' education is less valued, or perceived as generating lower returns, parents may favour sons over daughters. Early marriage can act as another barrier to secondary school progression. Parents may also worry more about the security of adolescent girls because secondary schools are often further from home than primary schools. The case for gender fairness in education is based on human rights, not economic calculus. Schooling can equip girls with the capabilities they need to expand their choices, influence decisions in their households and participate in wider social and economic processes. By the same token, there is clear evidence that economic returns to female education are very high - and, at the secondary level, higher than for boys. The implication is that countries tolerating high levels of gender inequality in education are sacrificing gains in economic growth, productivity and poverty reduction, as well as the basic rights of half the population. When girls enter school they bring the disadvantages associated with wider gender inequality, which are often transmitted through households, communities and established

social practices. Education systems can weaken the transmission lines, but building schools and classrooms and supplying teachers is not enough. Getting girls into school and equipping them with the skills they need to flourish often require policies designed to counteract the deeper causes of gender disadvantage. Public policy can make a difference in three key areas: creating incentives for school entry, facilitating the development of a 'girl-friendly' learning environment and ensuring that schools provide relevant skills. In most cases, simultaneous interventions are required on all three fronts.

In Iraq young girls are less likely to enter the school system and more likely to drop out of primary school, and few make it through secondary school. Interlocking gender inequalities associated with poverty, labour demand, cultural practices and attitudes to girls' education create barriers to entry and progression through school and reduce expectations and ambition among many girls.

In Iraq the overall number of children receiving primary education has declined between 2004-05 and 2007-08 by 88,164, with no improvement in the percentage of girls enrolled. Gross enrolment figures provided for the academic year 2005 - 2005 show 5,163,440 children enrolled in primary education. Girls account for 44.74% of students. Figures for 2007-2008 show 5,065,276 children enrolled in primary education, with 44.8 % being girls. This means that for every 100 boys enrolled in primary schools in Iraq, there are just under 89 girls. This under representation of girls in primary school in Iraq has been known for many years. The fact that there are declining numbers of girls in each successive grade has also been identified by analyses of the data. Analysis of the 2007 -2008 data shows the same picture. In every governorate a smaller percentage of girls than boys start school. There are no governorates where the number of children completing primary education is acceptable, and it is even less acceptable for girls. The current data replicates previously available data in showing a generally declining percentage of girls in each successive primary school grade. Some 75% of girls who start school have dropped out during, or at the end of, primary school and so do not go on to intermediate education. Many of them will have dropped out after grade 1. When all governorates' figures are combined, there are 21.66% fewer girls in grade 2 than in grade 1. Similarly there is a 28.63% national drop in the number of girls between grades 5 and 6. By the first intermediate class, only 25% the number of girls in grade 1 are in school; by the third intermediate class the figure is 20%.The percentage of girls in primary school classes is highest in Erbil, Dohuk and Sulaimaniya. These three governorates also have the highest percentage of children in pre-school education. In Erbil 15.8% of children attend preschool provision, Dohuk 11.3% and Sulaimaniya 11.4% compared with, for example 5.7% in Baghdad, 8.6% in Kirkuk, or 3.3% in Diyala. There is also a major issue with the number of children in each grade who are over age. The difference between gross and net enrolment data for 2007-08

shows that 659,896 children are above the age for the grade that they are in. This represents 13% of all primary school children - more than one in every ten. Of those children, 228,829 children were still attending primary school when they were aged 13 - 15+. The net enrolment rate for girls is 45.8%, as against a gross enrolment rate of 44.8%. This shows a significantly greater number of overage boys than girls. For example, only one third of teenagers still in primary schools were girls.

In order to increase girls' participation in education, it is vital to gain an insight into why they never attend school or drop out before completing their basic education. A small scale survey of 80 Iraqi girls was therefore included in the piece of work. While this is not a large or statistically valid sample, their responses provide a clear insight into many of the reasons why girls do not go to school. As would be expected, parents, particularly fathers, play a major role in whether the girls can attend school or not. The girls refer to a range of reasons why families do not support girls attending school. These include concerns about safety, family poverty, a reluctance to allow adolescent girls to continue to attend school, the distance from home to school, early marriage and the need to help at home. The journey to and from school presents problems caused by fast traffic, dogs or boys. Girls are frequently demotivated by the behaviour of teachers who beat them, distress them and are unwilling to explain subject matter that a student does not understand. Their answers make frequent references to being beaten or insulted by teachers, and to teachers being unwilling to give explanations in lessons or support students in their learning. The girls describe their schools as unwelcoming and unpleasant with too few facilities and resources. Schools are described as dirty, poorly maintained and uncomfortable, with dirty lavatories and no drinking water available. Safety is an issue, particularly in areas of major instability and insecurity. The concerns about safety relate to both military conflict and civil crime such as abduction and rape.

To address the issues identified, sets of recommendations are included in the report for the government and education services in Iraq, to address key policy issues and their implementation; Those for the government focus on policy development and implementation are, awareness-raising, school improvement and development, pre-service and in-service teacher training, curriculum development, alternative education strategies, and security for girls travelling to and from school.

The education system is facing a number of major difficulties. The system is chronically underfunded and is currently unable to respond to the demands despite efforts being made to improve the situation. Even where conditions are improving, a significant number of older children and young adults have missed out on crucial phases of their education and there are few opportunities for them to make good the years they have lost. The factors that contribute to placing Iraqi girls at an educational disadvantage and which need to be addressed through educational policy and its

implementation include:

- Lack of a school place;
- Shortage of teachers, particularly experienced teachers;
- The unacceptable behaviour of some teachers and principals;
- Dirty and dilapidated school buildings which lack basic facilities;
- Attitudes to girls' education;
- Lack of security;
- Lack of transport when distances are considerable or
- The journey is hazardous;
- Poverty; no money for clothing and school supplies and other indirect costs of going to school;
- Disability;
- Being needed in the home;
- Being needed to make a contribution to the family's business or income;
- Lack of official papers

Issues related to school infrastructure

If girls are to attend school, there must be a school for them to attend and teachers to teach them. Currently, there is an insufficient number of schools in good repair, with basic facilities for all girls to receive their entitlement to schooling and it is often difficult for girls to travel to and from school and there are particular issues when intermediate schools are situated outside the communities in which girls live. The third most frequent response to the question as to why girls between 6 and 17 who are not in school are not attending was that no school was available nearby. The number and location of schools, and their capacity, must therefore become a key educational issue for each governorate. There are places where schools are not available locally and some schools are very overcrowded and some have too few pupils. If universal basic education is to be achieved, there must be a school place for every child. This cannot be achieved easily or quickly, but an analysis of the number of school places needed, and where they are needed, could lead to an effective and realistic action plan to provide them. An adequate number of school places would encourage more girls to enrol in school and decrease the need for the shift system, which many girls in the survey indicated that they disliked. The rehabilitation of dirty and dilapidated school buildings which lack basic facilities must also be a policy priority if girls are to be encouraged to participate in education. In many cases the quality of the physical environment does not encourage girls to go to school. Many schools are in poor repair, are being used for other purposes or have been destroyed. The lack of acceptable sanitation and hygiene facilities is particularly unacceptable to girls and to their parents. Even if a school place in a clean, modern building were available for every girl in Iraq, this would count for nothing unless well trained teachers, upholding the expected standards of their profession were available to teach them. There is currently a shortage of teachers, particularly experienced teachers. The number of teachers available, particularly well qualified and experienced teachers is an issue and currently it is

doubtful that there are sufficient skilled and experience teachers in Iraq to make it possible for all girls to go to school and receive good quality teaching. "The number of teachers leaving the country this year (2006) is huge and almost double those who left in 2005," Professor Salah Aliwi, director-general of studies planning in the Ministry of Higher Education told reporters during an Aug. 24, 2006 interview in Baghdad. "Every day, we are losing more experienced people, which is causing a serious problem in the education system." This has caused a decline in the quality of teaching as experienced teachers left the country or ceased teaching because of attacks and lack of security. As security is improving teachers may return to Iraq, or return to teaching, but it is unlikely that they will all do so. To address this issue, in-service training needs to be provided to existing teachers to upgrade their skills and the number of well trained new teachers entering the profession needs to be increased. High quality training programmes and packages need to be developed to achieve this. The biggest drop in the number of girls enrolled in primary school in Iraq takes place between grade 1 and grade 2. Measures need to be taken to address this. The practice of using subject teachers rather than one class teacher for all subjects in the early grades makes schooling unfriendly for younger children and consideration should be given to phasing this out by training primary school teachers to deliver the whole curriculum to their classes, with only a very few exceptions for specialist subjects. The unacceptable behaviour of some teachers and principals in terms of physical and psychological punishments must be stopped, through training, effective management and through the creation and implementation of an effective disciplinary system to deal with those who behave unacceptably. Buildings and teachers, however high quality both may be, are of no value if girls are prevented from attending school by families, or societal attitudes or by cultural norms and expectations which do not encourage the education of all children. There is considerable anecdotal evidence and some research evidence, such as Yasmin Husein Al-Jawaheri's empirical research, published in *Women in Iraq: The Gender Impact of International Sanctions*, that attitudes towards girls and women have become, and are still becoming, more repressive and against the participation of girls in education and women in public life. Conservative beliefs are believed to be leading to violations of the rights of girls and women to life, physical integrity, education, health and freedom of movement. A lack of optimism about the future means that families see little point in making the investment in the future that education represents, particularly for girls who are seen to be unlikely to have careers - "Combined with the high rates of anxiety, depression, and post-traumatic stress disorders suffered by a large part of the war-affected population, these factors could have serious consequences on the physical and psychological health of Iraqi women, requiring interventions to help families and communities cope." A major challenge to the development of an effective education system for girls in 21st century Iraq is the need to challenge and change attitudes to girls,

their education and their future lives as women in society. Families and fathers in particular, need to be persuaded that their daughters must attend school. Religious and community leaders are key figures in promoting education for all children and for girls in particular and consideration should be given to involving them at all levels in campaigns to bring about universal basic education in Iraq and restoring the country to its previous position as a leader in region. Informal and non formal educational provision should be developed for girls who are not allowed to go to school and for older girls and young women who have missed the opportunity to benefit from basic education and are now too old to return to school.

Issues related to security and the journey to and from school

However much they may value education and however good it may be, parents are always unwilling to expose their children and particularly their daughters, to danger. The lack of security in some parts of Iraq makes parents reluctant to allow their daughters to go to schools and makes girls reluctant to attend. There is no doubt that the government of Iraq is making every possible effort to bring security to the country, but there are major issues in many areas which cannot be resolved quickly or easily. There are also issues concerning the lack of transport when distances are considerable or the journey is hazardous. The Ministry of Education should therefore consider home and distance learning options for girls for whom attendance at school is too difficult, dangerous or impossible in current circumstances. Home and distance learning options could also be useful for girls who cannot travel outside their home area to intermediate school, for example, or for girls whose families will not allow them to attend school.

Issues related to poverty

Although education is free in Iraq, school attendance is not without costs, both direct and indirect. Some families have insufficient money for clothing and school supplies and others need their daughter's contribution to the family's business or income either by the girl working or by her providing domestic help so that others may work. In the northern Kurdish territory, mounting poverty is said to contribute to the use of child labour and prevents children from attending school.

Although Iraqi officials believed that the 2007-2008 school year would see a much larger number of new school enrolments, 76.2% of respondents to A Women for Women survey of 1,513 Iraqi women said that girls in their families are not allowed to attend school, and 56.7% of respondents said that girls' ability to attend school has become worse over the last four years. According to Women for Women International Iraq staff, the primary reasons for this are poverty and insecurity. While 49.6% of respondents describe their opportunities for education as poor, and 16.6% say they have no opportunities at all, 65.1% of respondents say it is extremely important to the welfare and development of their communities that

women and girls in Iraq be able to access educational opportunities.

Issues related to disability

Every difficulty faced by Iraqi girls of school age in attending school will be at least doubled for girls with a disability. If the distance to school, the poor state of the buildings, the absence of basic facilities, unsympathetic teachers, and lack of help in understanding lessons, family protectiveness and the attitudes of society are barriers to many girls attending school, they are likely to be insurmountable blocks for girls with disabilities. Careful consideration needs to be given to preventing disability wherever possible and to providing different access routes to education, including distance and home learning opportunities, for girls who cannot attend schools with their non-disabled peers.

Lack of official papers

Many children come from internally displaced families and do not have the documents required to register for school and this needs to be addressed through the appropriate channels as quickly as possible so that children do not continue to miss out on education. Children who stop going to school become less and less likely to return as time goes by and so it is essential that any gaps in school attendance are remedied as soon as possible and that children who have had a period out of school are helped back into regular attendance through bridging programmes.

Children who lack the skills for school

Although girls have more limited access to education than boys, are less likely to complete their primary education and are much less likely to complete their secondary education, there is also an increase in the number of boys not attending school or succeeding in their education.

Participation would be improved by the provision of pre-school education, linked to feeding programmes in very poor areas, to increase children's language development and prevent the consequences of poor nutrition. Evidence is increasing that it is likely that a large number of children in Iraq suffer from preventable learning difficulties related to lack of early stimulation and learning. The Multiple Indicator Cluster Survey carried out in 2006 found that 18% of two year old Iraqi children could not name at least one object. In Salahuddin as many as 35% of two year olds were not able to do this. Two year olds with normal language development could be expected to have a vocabulary of some 150 -300 words. This degree of language delay may result from widespread psycho-social consequences of war, including increased poverty and fearfulness. In times of peace and optimism adults naturally talk to babies and young children without being taught about the benefits of early stimulation. However, psychosocial difficulties and poverty, including, preoccupation with day-to-day survival, amongst adults prevent them from being able to talk to or stimulate their

children in the normal way. The children therefore do not develop adequate language skills. Children with such very limited language are very unlikely to be ready to succeed in education when they reach school age. They will be unable to understand or respond to the school curriculum and are at risk of dropping out of school. The same survey reports that 15% of Iraqi children between 2 and 14 years of age have at least one type of disability - a large number being impairment of speech and language. An emphasis on the development of early language skills could therefore increase the number of children entering school with enough language to participate in learning and decrease the number of children who drop out of school in the early grades because they do not have sufficient language skills to benefit from the education provided. Such initiatives would benefit all young children, but girls would benefit most. Language delay and difficulties make school enrolment less likely as families will often keep children at home if they know that they will not be able to cope at school. For those who do enrol, difficulties in such a crucial area for learning create major barriers to achievement in school. Failure then causes children to drop out of education. In addition to the difficulties caused by lack of stimulation, children's cognitive development is also affected by poor nutrition. Brain development is most sensitive to a baby's nutrition between mid-pregnancy and two years of age. Children who are malnourished throughout this period do not adequately grow, either physically or mentally. Their brains are smaller than normal and they also lack a substance called Myelin. Myelin is a very dense, fatty substance that insulates the electrical pathways of the brain, rather like the plastic coating on a power cable. It increases the speed of electrical transmission and prevents adjacent nerve fibres from mixing their messages. Myelination (the coating or covering of axons with myelin) begins around birth and is most rapid in the first two years. Because of the rapid pace of myelination in early life, children need a high level of fat in their diets -some 50 percent of their total calories- until about two years of age. Inadequate brain growth and inadequate myelination are reasons why children who were malnourished as foetuses and infants suffer lasting behavioural and cognitive deficits, including slower language and fine motor development, lower intelligence (IQ), and poorer school performance. So decreasing stunting and wasting as a result of poor nutrition will also increase the chances of children attending school and achieving.

Figures suggest that in addition to the worryingly large numbers of children who never enroll in school, over 100,000 children who enroll in grade 1 each year do not enter grade 2 and another 100,000 drop out between grades 2 and 3. Many of these children will fail in these early grades because they have learning difficulties caused by lack of brain development in their early years as a result of under stimulation or poor nutrition which has impaired their ability to learn.

Recommendations to the government of Iraq to improve the current situation

As the 2007 Annual Report for UNICEF Iraq rightly notes 'Substantial impact on children's wellbeing will only emerge once major gaps in Iraq's weak legislative and social work systems for children are bridged - an effort likely to take some years.' The people who will be part of bridging those major gaps are the children of today. Half of them are girls. Unless efforts are made today to improve the education of children, especially girls who fare even worse than boys in the current situation, the nation's capacity to build a strong and effective legislative framework and a much needed, fully functioning social work system, will be severely compromised.

To improve the education system, it is recommended that the new Government of Iraq that will be in power following the 2010 elections:

- Makes education a key priority by publicly and wholeheartedly subscribing to a vision for compulsory primary education in which all children are able to attend school, learn well and achieve their potential. This should be based on the concept that, other than in rare health related cases, there are no valid reasons for a child of primary school age to be out of school. All policies, strategic plans and action plans must include a specific section on the education of girls and strong reassertion, at national level of the right of every girl to attend school and the benefits of education to the girls, their families and to the country in general
- develop an updated national policy framework based on the inclusion of every child of primary school age in school;
- implement the content of the policy through a clear 10 year national strategic plan for improving education for all Iraqi children, with a substantial separate section on the issues which have a particular impact on girls' education. The strategic plan would include, for example, the identification of areas of greatest deprivation and need; the building and refurbishment of schools so that they all have decent lavatories and access to drinking water, the phasing down of the shift system, national awareness and attitude changing campaigns; strategies to enable even the poorest children to attend school; improving the training, in-service support and improved management of teachers. The section on issues which relate to the issues which have a particular impact on girls' education would include, for example, an increased number of intermediate schools for girls, strategies for keeping girls safe, the development of teaching materials and teaching methodologies which include girls and their learning styles
- establish an annual action plan, linked to the national plan, in every governorate in Iraq, which is monitored and its implementation evaluated each year
- develop a major national initiative for the in-service retraining and management of teachers so that they develop skills for effective teaching to enable the range of children in their classes to learn effectively and do not physically or mentally abuse students and so that they

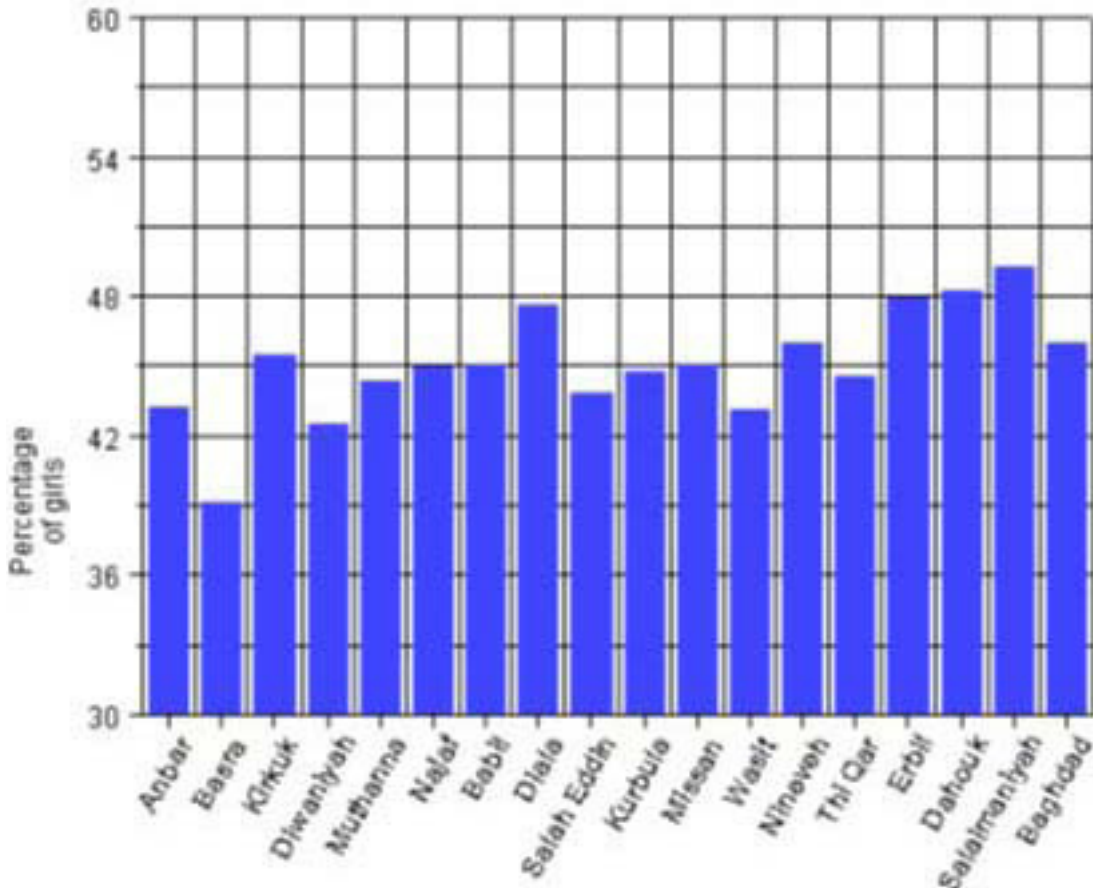
can be taught effectively

- plan and implements a national campaign, supported by influential religious and civil leaders and linked to improved security, to encourage families to see it as their religious duty and duty as citizens to send their daughters to school.
- increase pre-school education for 3-5 year olds to ensure that they are developing the skills and concepts that they need to learn successfully in school.
- develop home and distance learning programmes, and informal and non-formal educational approaches for girls who cannot attend school for any reason, including lack of security, parental attitudes, and disability.
- develop programmes for older girls and young women who have not completed their basic education and are now too old to return to school.

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- (continued page 43)

Figure 1: Percentage of girls in primary education by governate



Governorates Net enrolment data

Figure 2: Girls decline in numbers. Grade 6 compared to Grade 1

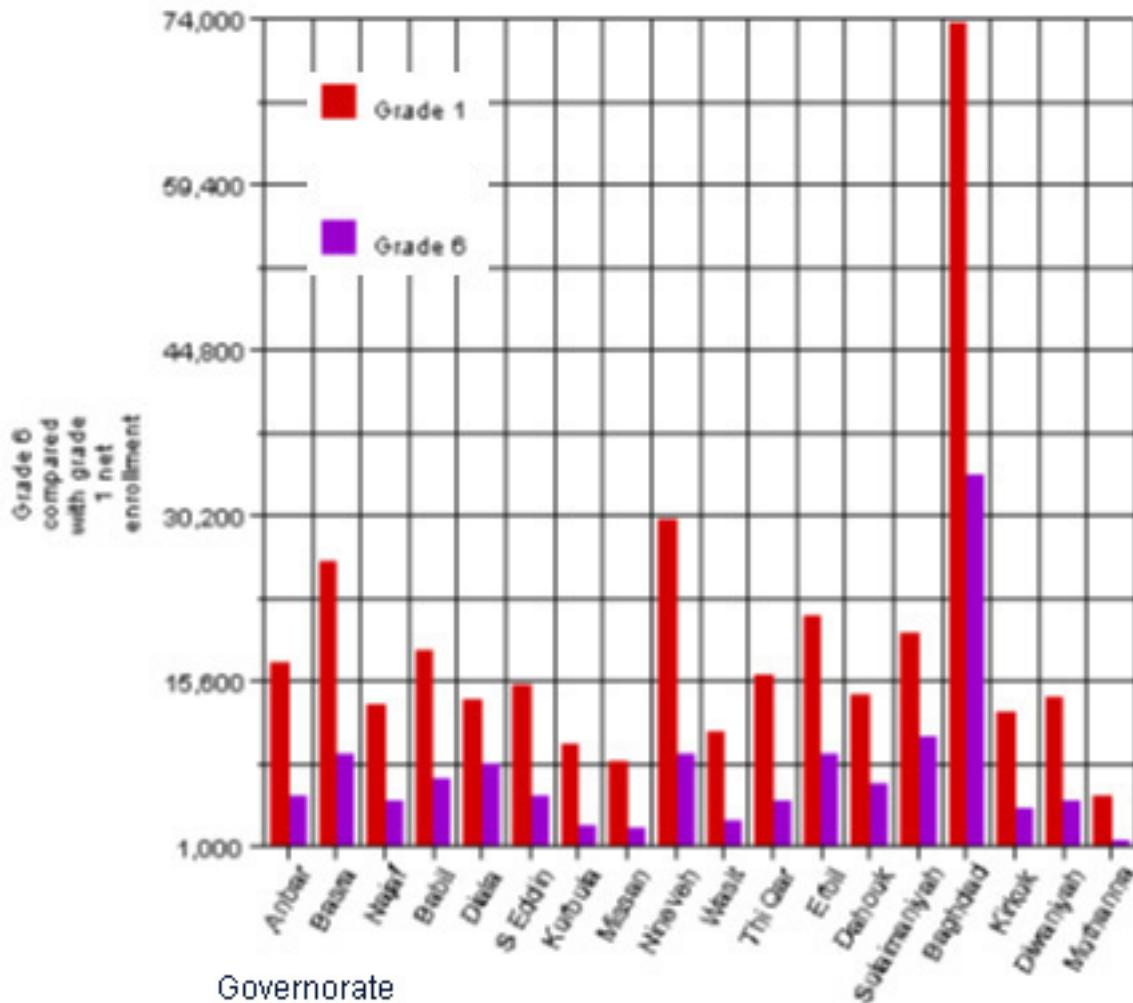


Figure 3: Girls decline in numbers. Grade 6 compared to Grade 1

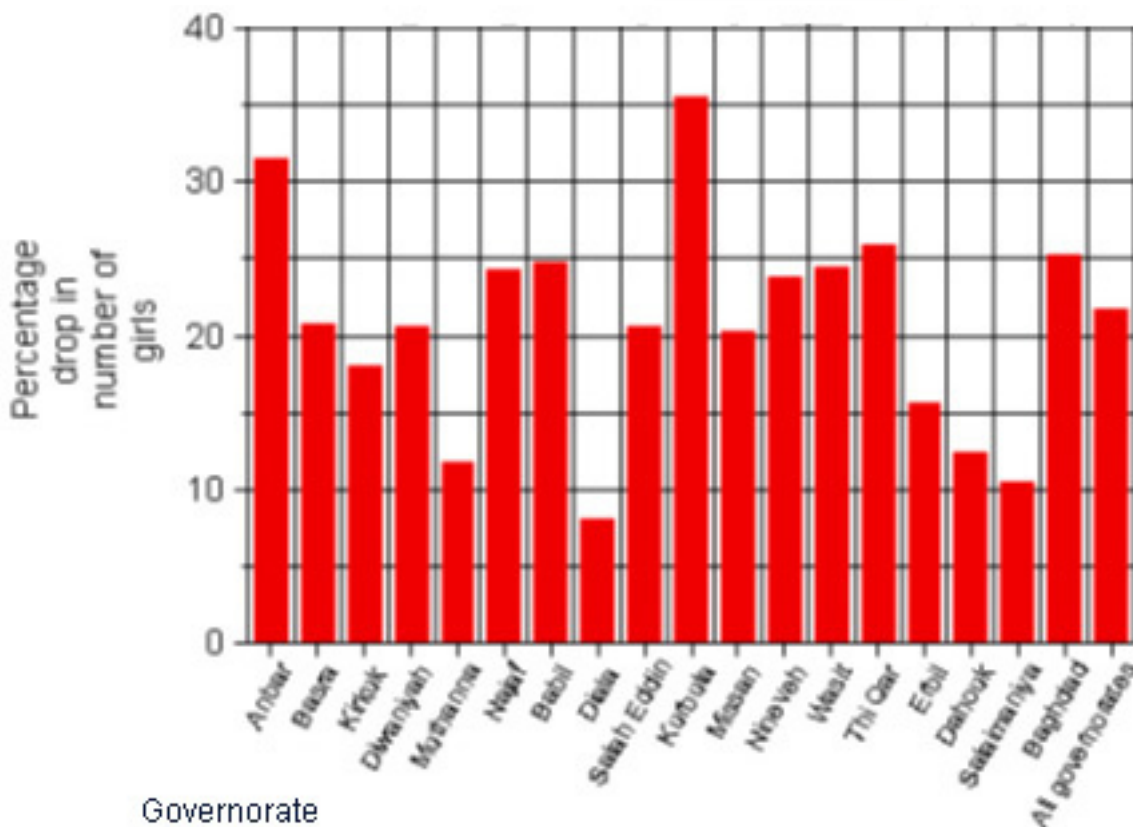
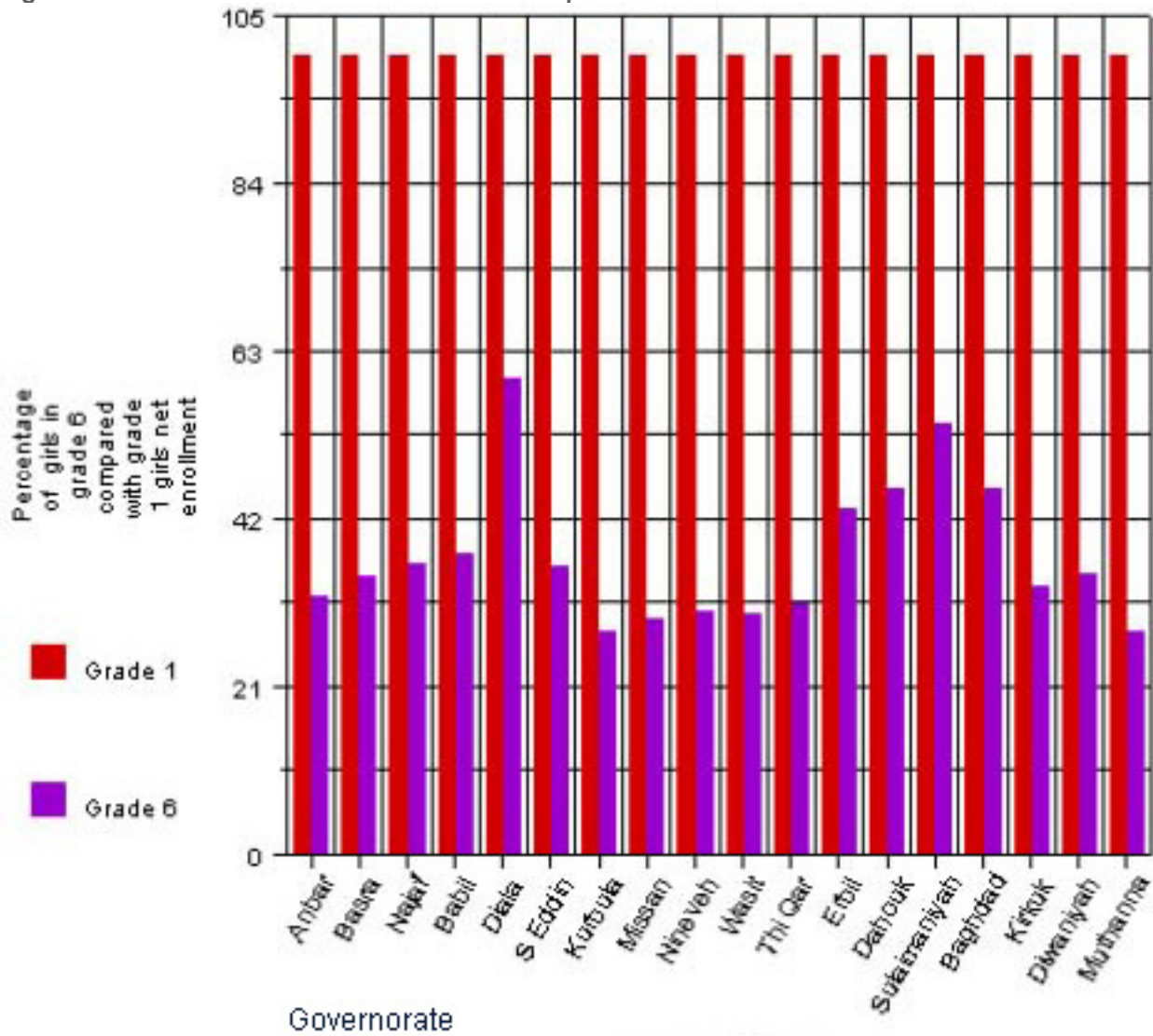


Figure 4: Percentage drop in the number of girls between Grades 1 and 2

Figure 5: Percentage drop of number of girls between Grade 6 and 1st intermediate

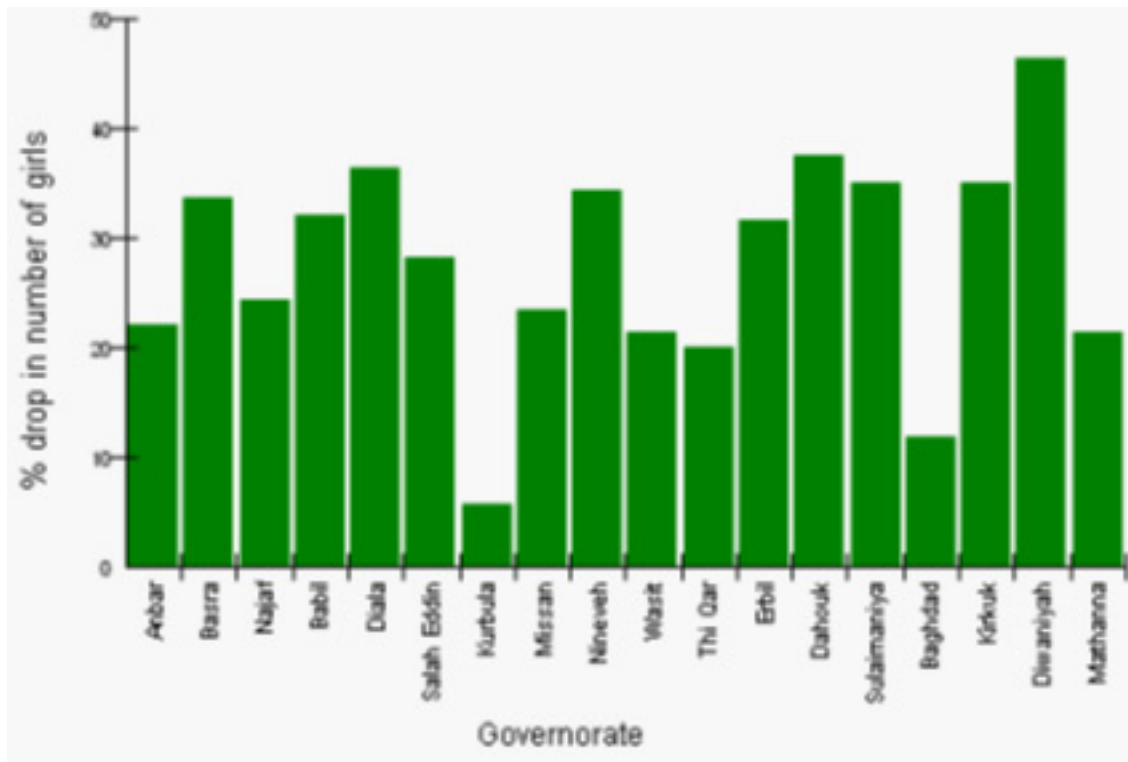
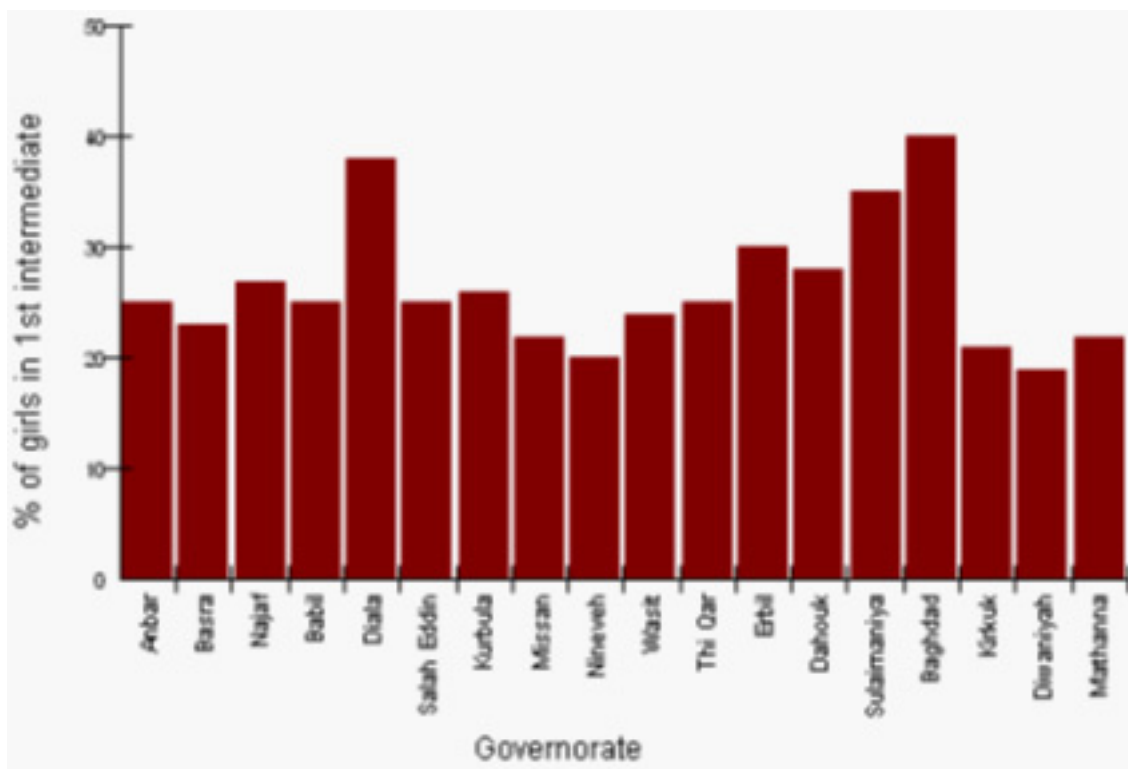


Figure 6: Percentage of girls in 1st Intermediate class as compared with Grade 1



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Figure 7: Decline in numbers in net enrolment of girls - Grade 1 to 3rd intermediate

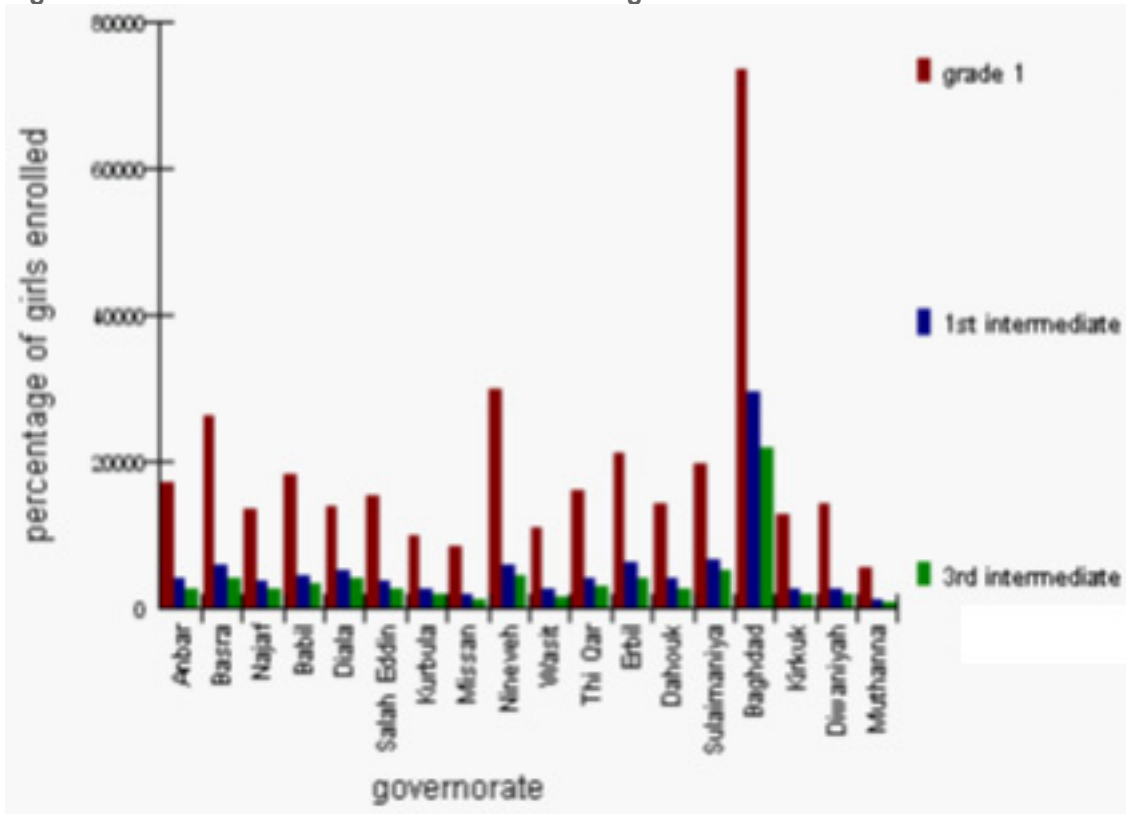


Figure 8: Girls decline in numbers - Grade 1 to 3rd intermediate class

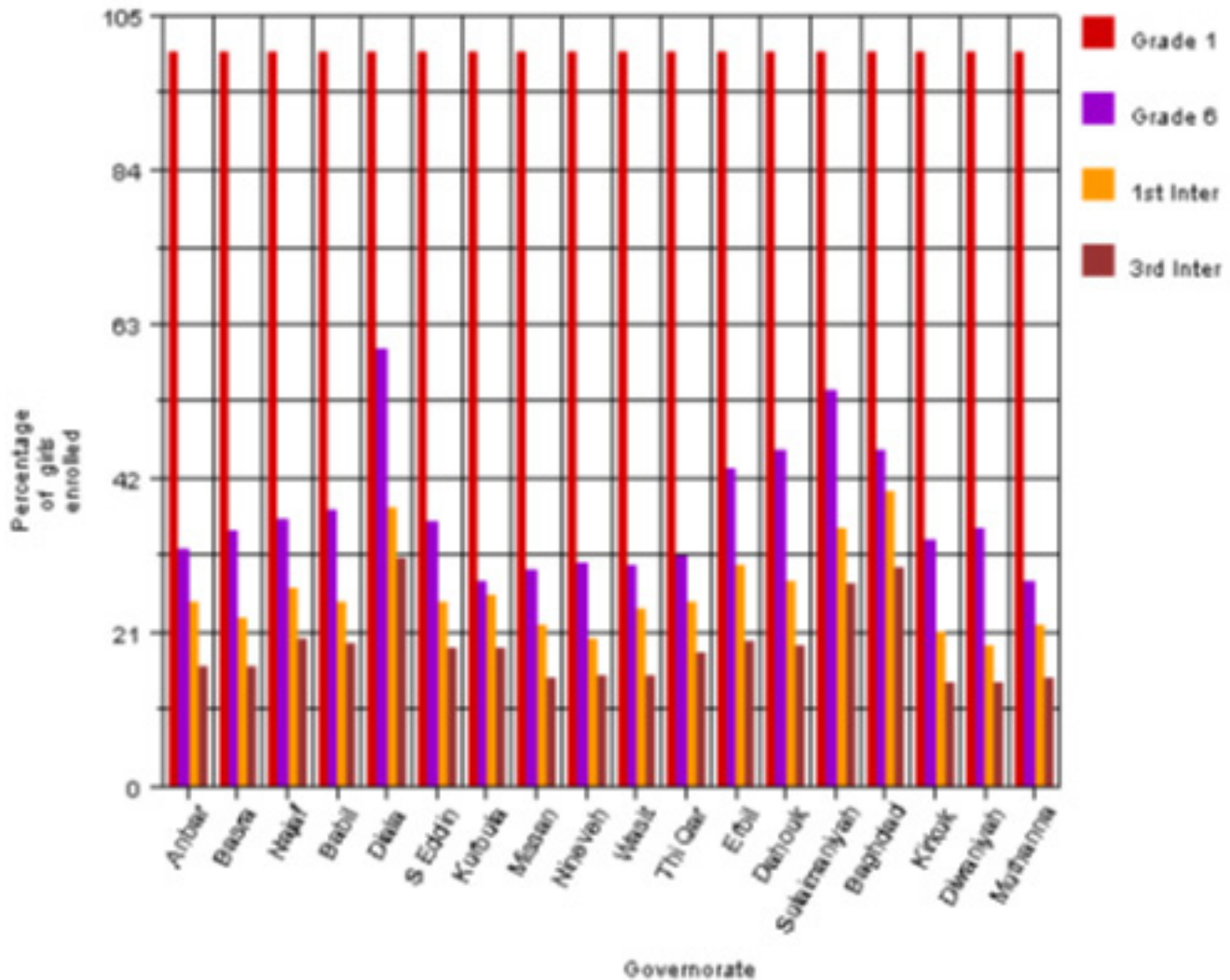
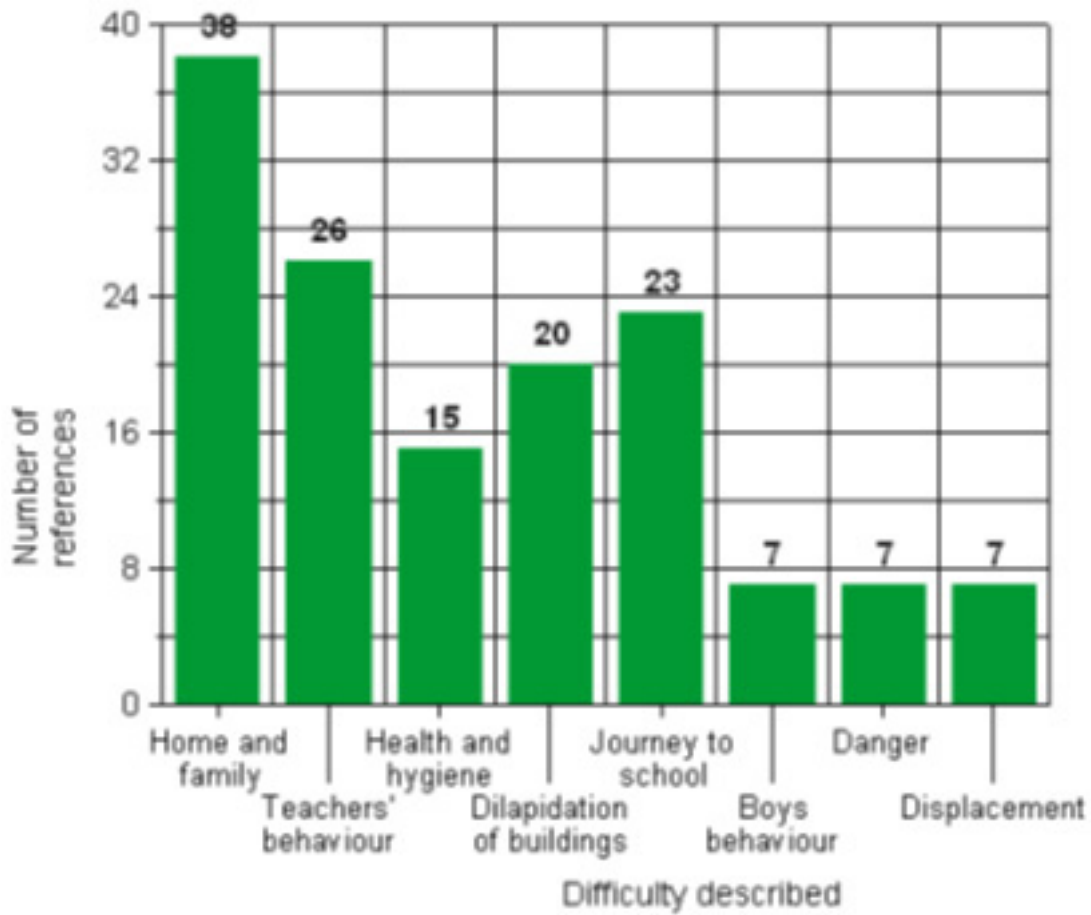


Figure 9: Difficulties in school access



Emerging trends of Shisha smoking in Pakistani youth

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Shisha seller

Origin of hookah smoking

Hubble bubble, hookah or waterpipe smoking historically started in the time of the Safavid dynasty in the Persian Empire. From there, it reached the Indian subcontinent, Egypt and the Levant during the Ottoman dynasty. Hookah smoking is now prevalent over many countries of the world mainly due to immigrants from the native areas.

Introduction

Hookah is a way of smoking dry or wet tobacco through a bowl of water with a tube or pipe. Most people use dry or wet tobacco but some also mix tobacco with molasses sugar. Traditionally it was popular in the old and adult (mainly men) but now it is more prevalent and popular in youth who through their innovations transformed traditional hookah into modern Shisha with the belief of making smoking safe. The incidence of shisha smoking is rising quickly in young boys and even in children in Pakistan. A small number of girls also use shisha on special occasions. This starts as fashion but soon becomes a need due to nicotine addiction.

Shisha smokers mostly use flavored tobacco mixed with fruit or molasses sugar which makes the smoke more

aromatic than cigarette smoke. Popular flavourings include apple, plum, coconut, mango, mint, strawberry and cola. The fruit syrup or sugar renders the tobacco damp, therefore, wood, coal, or charcoal is burned in the shisha pipe to heat the tobacco and create the smoke.

Misconception about shisha smoking

Many people believe that shisha smoking is not addictive because the water used in the shisha / hookah can absorb nicotine. This is not true as only some of the nicotine is absorbed by the water and enough nicotine enters their blood to cause an addiction.

Our youth claim that the Shisha is not just an activity rather its part of an interesting lifestyle that brings along with it good times, good company and great memories. Shisha smoking is typically done in groups, with the same mouthpiece passed from person to person. Shisha cafes are now increasingly popular in Pakistan.

The latest trends in shisha smoking

Many new types of Shisha have been invented. These are marketed with the claim of no or very low toxicity. These include Herbal Shisha, Shisha pens and steam stones. Shisha Pens also known as Shisha sticks are the world's first portable electronic shisha smoking device.

Non-tobacco Hookah Products

Some sweetened and flavored non-tobacco products are sold for use in a hookah. Labels and ads for these products often claim that users can enjoy the same taste without the harmful effects of tobacco. Studies of tobacco-based shisha and “herbal” shisha show that smoke from both preparations contain carbon monoxide and other toxic agents known to increase the risks for smoking-related cancers, heart disease, and lung disease. [1]

Health hazards of Shisha smoking

Shisha smoking has now become an industry comprising of shisha manufacturers, tobacco sellers and shisha café owners. There are false claims of harm reduction and safety as compared to cigarette smoking in print and electronic commercial media by the promoters.

Using a hookah / shisha to smoke tobacco poses serious health risks to smokers and others exposed to the smoke from the hookah. The main ingredient of hookah or Shisha is tobacco. Shisha / Hookah smokers may be at risk for some of the same diseases as cigarette smokers. These include: reduced lung function, lung cancer, heart disease, TB, oral cancer, stomach cancer, cancer of the esophagus and decreased fertility [1]

When someone smokes shisha, he and all sitting near him are breathing in smoke which releases toxins including carbon monoxide and heavy metals like arsenic and lead. Flavored tobacco is smoked over coals and fumes from these fuels add new toxins to the already dangerous smoke. A typical hour long shisha session involves inhaling 100 to 200 times the volume of smoke inhaled when smoking a cigarette. A latest study provides the first evidence about the potential hazards of exposure to waterpipe-associated secondhand smoke. Hazardous particles of various sizes can build up gradually during waterpipe use to reach dangerously high levels presenting a risk to non-smokers and a particular risk to pregnant women. [2]

Social hazards of Shisha smoking

The social hazards of Shisha may affect personal life, family and friends. These may reduce working ability and performance. Shisha smoking is done in groups. Youth is often in a high mood and it is not uncommon to see violence due to non tolerance of various groups. The quest for more pleasure and fun sometimes leads to drug addiction. Some are also involved in unprotected sexual activities leading to sexually transmitted infections (STIs), mostly gonorrhoea and hepatitis-B. The long hour sittings cause distraction from studies and other useful and healthy activities like sports.

Conclusions and Recommendations

Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) have clearly warned that Hookah smoking is not a safe alternative to smoking cigarettes. [1] [2] Tobacco users should quit all tobacco products to reduce health risks.[1] Waterpipes should be subjected to the same regulations as cigarettes and other tobacco products. Waterpipes and waterpipe tobacco should contain health warnings. Claims of harm reduction and safety should be prohibited.[2]

There is an intense need to address the misconceptions about the myths of shisha smoking. We should create healthy and useful activities for our youth. The youth councilors and sports institutions must play their proactive role towards this end.

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Roy Adaptation Model: Application of Theoretical Framework

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Abstract

Roy Adaptation Model has the five main concepts of nursing theory: the health, the person, the nurse, the adaptation and the environment. Roy views the person in a holistic way. The core concept in her model is adaptation. The concept of adaptation assumes that a person is an open system who responds to stimuli from both internal and external aspects of the person. This study will be guided by Roy Adaptation Model as a conceptual framework in order to (1) to investigate the relationship between environmental stimuli (focal, contextual, and Residual stimuli) and four adaptive modes of RAM which causes cancer related pain (2) and to note the effect of environmental stimuli on coping mechanism (3) to correlate research variable with theory concept, and to assist the researcher to predict the results and recommendations by answering the research question.

Key words: cancer pain, Roy Adaptation Model, barriers, barriers to cancer pain management, pain management, attitude, and beliefs.

Background

Breast Cancer is the most common malignancy in women and accounts for 22.9% of all female cancers worldwide (Ferlay, Shin, Bray, Forman, Mathers, Parkin, 2010). One in 8 women will be diagnosed with breast cancer in their lifetime (National Cancer Institute, 2010). In Jordan, breast cancer accounts for 18.8% of the total new cancer cases and is ranked first among cancer in females, accounting for 36.7% of all female cancers, and is the leading cause of cancer deaths among Jordanian women (Jordan National Cancer Registry, 2008). Approximately 925 breast cancer cases were registered among Jordanian women in 2011, according to official figures.

Recently, oncology researchers indicated that 44% of breast cancer patients experience pain (National Institutes of Health, 2002; Al Qadire, 2012; Potter, Wiseman, Dunn, et al. 2003). However, cancer pain is still inadequately treated among patients who are suffering from cancer disease (Ward, Donovan, Owen, et al. 2000). Generally, cancer pain may occur at any stage of the disease, and depends on the type of tumor, and location of metastases (Greenwald, Bonica, & Bergner, 1987). However, in breast cancer, pain is almost iatrogenic, due to many factors such as chemotherapy treatment, radiotherapy and postoperative complications (Marchettini, 2008). This specificity could be of some importance regarding barriers of breast cancer pain management.

Introduction

Uncontrolled cancer related pain is still a permanent, feared, and prevalent problem throughout the world (Bagciva, Tosun, Komurcu, Akbayrak, & Ozet, 2009). One in 8 women will be diagnosed with breast cancer in their lifetime (National Cancer Institute, 2010).

There are many factors contributing to ineffective pain management of cancer patients, including barriers within systems of care, health care professionals, and among patients and their family (Finley, Forgeron, & Arnaout, 2008).

The American Pain Society recommended patient involvement as a primary focus for improving the quality of cancer pain management (Gordon et al., 2005). Patients' beliefs about reporting pain and using analgesics have an important function in their pain levels (Vallerand, Templin, Hasenau, & Doucet, 2007) and the effectiveness of their pain

management (Bagciva, Tosun, Komurcu, Akbayrak, & Ozet, 2009; Gunnarsdottir, Donovan, Serlin, Voge, & Ward, 2002).

Many researchers reported that patients are reluctant to report their pain for reasons including fear of side effects, fatalism about the possibility of achieving pain control, fear of distracting physicians from treating cancer, tolerance, addiction and belief that pain is indicative of progressive disease (Potter, et al. 2003; Miaskowski & Dibble, 1995; Finley, Forgeron, & Arnaout, 2008). All of the factors mentioned previously represent worse factors affecting all dimensions of quality of life for patients and their families. (National Institutes of Health, 2002)

Many researchers have studied the barriers of pain management among cancer patients generally, but there has been little investigation of the barriers of pain management in breast cancer patients. In Jordan, breast cancer is the most common cancer afflicting women. According to statistics from Jordan, major obstacles to patients reporting pain and using available analgesics include misconceptions regarding beliefs about disease and pain, and pain medication (Dawson et al., 2002; Gunnarsdottir, Donovan, Serlin, Voge, & Ward, 2002; Jacobsen et al., 2012). However, little published research was found that discussed the pain barriers of Jordanian patients with breast cancer.

To enhance the quality of breast cancer pain management, it is very important to better understand the phenomenon of patient-related barriers to breast cancer pain management. For this reason, it is essential to explore the barriers from the patient's point of view. However, there have been knowledge gaps in the literature to date regarding barriers of breast cancer pain management. Thus, investigating the patient-related barriers to breast cancer pain management, will help to fill the gaps in knowledge related to patients' barriers and consequently will enhance the quality of breast cancer pain management. Thus, the aim of this study is to investigate the barriers that have impacted pain management of Jordanian breast cancer patients. The purpose of this study is to correlate barriers to effective pain management among breast cancer patients and RAM.

Conceptual Framework

The study will be guided by Roy Adaptation Model, 1991 (RAM). (RAM) is one of the most frequently used conceptual frameworks to guide nursing research, education and practice.

The contributions of this theoretical framework are that it will lead to a more systematic guide for researchers and an increased quality of nursing practice, as well as organized nursing knowledge through research and provides a more organized curriculum. The model provides a way of thinking about people and their environment that is useful in any setting. (Roy & Andrews, 1999)

Overview of RAM

Roy Adaptation Model has the five main concepts of nursing theory: the health, the person, the nurse, the adaptation and the environment. Roy views the person in a holistic way. The core concept in her model is adaptation. The concept of adaptation assumes that a person is an open system who responds to stimuli from both internal and external aspects of the person (Roy & Andrews, 1999). Environmental stimuli are categorized as focal, contextual, and residual stimuli. Focal stimuli represents an immediate and apparent cause of the problem (Roy & Andrews, 1999, p. 31); contextual stimuli are other causative factors whilst residual stimuli relate to the patient's past experiences with the illness and how these experiences may impact upon the patient's current condition. Regulator and cognator activities as a coping mechanism are manifested through a patient's illness. Regulator activities are physiological in nature whilst cognator activities may range from a physical attribute to a psychological or social attribute (Roy & Andrews, 1999, p. 32). The nurse's role while caring for a patient involves manipulating the stimuli that comes from the environment so that they fall within the client's field of positive coping resulting in adaptation. The adaptation is considered as the effective response to a stimulus, whereas a negative response is described as ineffective. Adaptation takes place in one physiological mode and three psychosocial modes. The psychosocial mode of adaptation includes self-concept; role function, and interdependence mode, four modes of adaptation are an interrelated relationship.

This study will be guided by Roy Adaptation Model as a conceptual framework in order to (1) to investigate the relationship between environmental stimuli (focal, contextual, and Residual stimuli) and four adaptive modes of RAM which causes cancer related pain (2) and to note the effect of environmental stimuli on coping mechanism (3) to correlate research variable with theory concept, and to assist the researcher to predict the results and recommendations by answering the research question.

Relationship between Research Variables and RAM Concepts

Three type of stimuli that affect the four adaptive modes by making barriers to effective pain management in breast cancer patients are as follows: suffering of patient from pain causes physiological effect such as absence of activity, decreased rest, and poor nutrition (physiological mode); mastectomy affects sensation of body image among women, and could cause social isolation (self concept-group identity mode); the cancer disease itself and when adding cancer pain, affects the role of patients in family, with friends, and society and causes poor communication with others (role function mode); and it affects the ability of patients to love, respect, value, and make close relationships with others (interdependence mode).

Focal (breast cancer); contextual (cancer pain); and Residual stimuli (fear of addiction and side effect,

fatalism, and belief) are considered factors that affect coping mechanism (regulator and cognator). According to RAM, the coping mechanism in this study will be the regulator subsystem that helps patients to overcome cancer pain in response to neural, chemical, and endocrine systems (Roy and Andrews, 1999), while cognator subsystem helps patients to overcome cancer pain through the four types of systems involved (cognitive emotion channels, perceptual and information processing, learning, judgment, and emotion (Roy & Andrews, 1999). For example, uncontrolled pain and poor management over some side effects of pain medication such as opioids could be the causes of constipation and the beliefs regarding that pain medication is harmful for the human body creates a wrong belief among patients and causes a negative impact on this mechanism in order to cause the patients to refuse treatment. This is considered a barrier to pain management (relationship between regulator mechanism and residual stimuli).

Learning, perceptual, informational process, and judgmental activity have a strong relationship between belief and judgment of patients and their family over cancer and cancer related pain (Relationship between cognator mechanism and residual focal stimuli).

At the empirical level, the relationship between demographic data sheet (DDS) and BQ have a significant relationship between the pain level in stage I and stage II of cancer disease; also the mentality of patients regarding cancer and cancer pain differ according to age, educational level, and treatment method between patients etc.. In this study, the final result (output) will be assessed according to the following: if the BQ score is more than 2.5 and associated with DDS variable this patient is considered to have a positive relationship and have barriers to effective pain management and needs a feedback process immediately to overcome this barrier to alleviate suffering by changing the perception of patients toward pain treatment or a need to change or modify the treatment plan. On the contrary, if the patients have BQ score less than 2.5 this tends to have a negative relationship between DDS and BQ, thus there are no barriers to effective pain management among patients.

Summary and Conclusions

Research studies in the oncology field of western countries revealed several barriers to effective pain management such as fear of addiction, fear of developing tolerance, fear of side effects, and fatalistic beliefs. Identifying barriers to effective pain management from the patient's perspective in breast cancer patients in Arab and Islamic culture is the focus of this study.

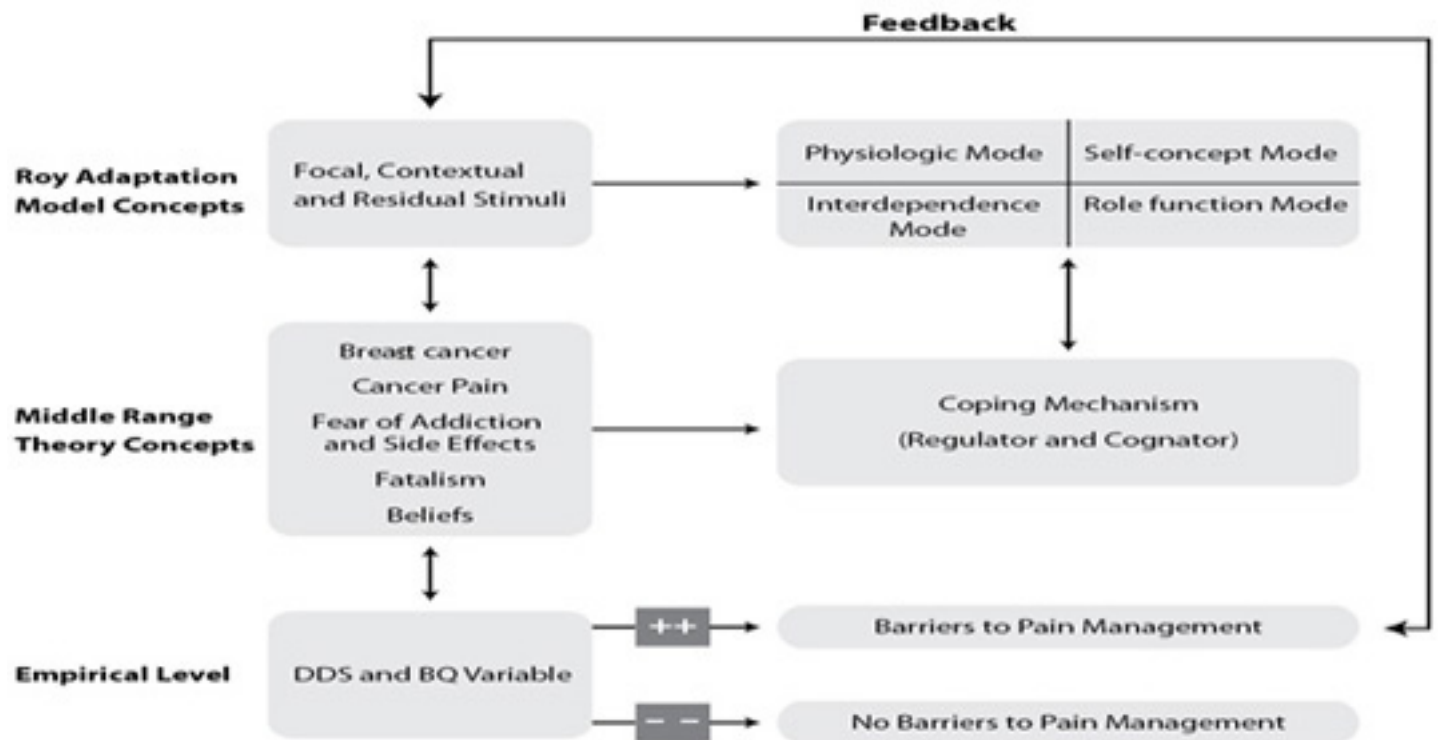
Cancer pain and its under-treatment is a major health issue. Multiple factors are associated with ineffective cancer pain management such as cultural factors, misperception about pain medication (fear of side effects, fear of addiction, and tolerance), patient's demographic characteristics and patient's beliefs such as fatalism, which increases the suffering and reduces quality of life for patient and their families.

Many barriers to effective cancer pain management have been reported in order to establish clear guidelines and an educational program to overcome these barriers, to relieve pain and suffering among cancer patients.

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Figure 1: The Conceptual Framework



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How to select and cite scientific works

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Abstract

Scientific progress depends on past achievements. Therefore, it is necessary to select and cite very accurately previous works in order to prepare solid ground for further progress. The aim of the present article therefore is to provide some practical guidelines in the selection and citation of previous works when writing a scientific article.

Key words: References, citations, guidelines

Introduction

“If I have seen further it is by standing on the shoulders of giants”. This historical famous quote which has been reused by Sir Isaac Newton in a letter to Robert Hooke (http://en.wikipedia.org/wiki/Standing_on_the_shoulders_of_giants) clearly highlights the importance of previous scientific works in further progress of any given subjects of human knowledge.

Scientific progress depends on past achievements. Therefore, it is necessary to select and accurately cite previous works in order to prepare solid ground for further progress. The aim of the present article therefore is to provide some practical guidelines in the selection and citation of previous works when writing a scientific article.

Practical guidelines

1. Before writing a scientific article make sure you read all the relevant and valid literature related to the topic. In this context relevant implies literature that helps you to write the Introduction, Methods and Discussion sections of your article. Furthermore, implies articles which are published in the peer reviewed prestigious journals.
2. Bear in mind that literature, such as theses, meeting abstracts, weblogs, newspapers, etc. should be avoided as much as possible. This literature is usually categorized as “Grey literature” i.e. literature that usually does not pass peer review process. Moreover, try to minimize the use of textbooks.
3. When you determine all the relevant and valid literature you can start the process of writing. Be careful to cite a reference whenever an idea is given. However, when you have some references that support one idea and you should select between them, cite more “up-to-date” and “easy to access” articles.

4. "Easy to access" or "open access" references are those that you need not pay money to read. However, you should be able to distinguish between real and prestigious "open access" journals from less prestigious ones.
5. Never cite a reference before you thoroughly comprehend it. Similarly, it is not wise to cite a reference only because someone else has cited it. The reason for this is clear as people might erroneously cite previous works. It is your duty to read the original reference and only then cite it as appropriate.
6. On very rare occasions when you do not have access to the original reference you should tell the reviewers and readers of your article that you are citing a reference (e.g. A) that you have read in another reference (e.g. B). In your reference list first give the details of reference A and then say "cited in" and then give the details of reference B.
7. In order to avoid plagiarism and self-plagiarism it is wise to avoid copy and pasting from your references even if they encompass some of your previous articles. Instead, you should get the main idea, re-write or paraphrase and place the proper citation immediately after it.
8. On the rare occasions when you decide to directly quote a sentence or two from a reference, make sure to use quotation marks and place the proper citation immediately after them, similar to what I have done at the beginning of this article.
9. Always carefully follow the "instructions for authors" of your target journal. Bear in mind that usually two major types of style might apply in referencing i.e. the Vancouver and the Harvard styles. The Vancouver style is used more frequently compared with Harvard style.
10. In Vancouver style each reference is identified by a number based on its order of appearance in the text. Then the details of the references are arranged in the reference list based on their number. In Harvard style each reference is identified by the surname of its first author plus the year of publication. Then the details of the references should be arranged alphabetically in the reference list.
11. Nowadays different software has been designed to help the authors to automatically place relevant literature in their articles. Although using such software would substantially ease such cumbersome activities authors should check meticulously their final draft as some unwanted errors might have occurred.
12. Based on the "instructions for authors" of your target journal use the appropriate number of references. However, if such number is not given within the "instructions for authors", use most of your relevant and valid references. As a golden rule it is always better that reviewers ask for reduction of the number of your references rather than asking you to raise them. One of the worst criticisms that reviewers might put forward would be that you have missed one or more relevant and valid items of literature.

Conclusion

The importance of proper citation of previous scientific works in the further progress of any given subjects of human knowledge is evident. In this article twelve practical guidelines are provided to help authors how to select and cite valid previous works when writing a scientific article.

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CME Quiz

Sami is a previously well 3 year old boy who presents with a spreading rash around his left armpit. Can you identify his condition?



Answer

Sami's lesions are typical of bullous impetigo. The shallow spreading weeping lesions, absence of surrounding erythema and the presence of new lesions nearby are typical features.

Practice tips

- If you are unsure of the diagnosis, you should take swabs for bacterial microscopy and culture.
- Treat with an appropriate oral antibiotic (e.g. erythromycin or flucloxacillin). Small areas can be treated with topical mupirocin.
- If crusts are present, soak to remove
- Reduce scratching of dry areas with a topical ointment (e.g. paraffin).
- Isolate from other children until one day after commencing antibiotics.

