

Aqil M. Daher¹
Tahseen A. Al-Rubai
Ahmed S. Al-Nuaimi
Ameel F. Al-Shawi
Usama Medhat

THE IMPACT OF BREAST CANCER ON QUALITY OF LIFE AMONG A SAMPLE OF FEMALE IRAQI PATIENTS

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Abstract: *Objectives:* Breast Cancer (BC) is the most common cause of cancer-related death among females which affects quality of life. This study aimed at describing the impact of Breast Cancer (BC) on quality of life among a sample of Iraqi patients. *Methods:* A sample of 263 Breast cancer patients attending Al-Amal National hospital for Cancer management was invited to participate in this study. The impact of BC on quality of life was measured using the newly developed Impact of breast cancer questionnaire. It is composed of 20 domains that tap different aspect of life might be affected by BC. *Results:* More than half of the interviewed female patients were in their 50s and attained secondary education. About 60.8 % were married and more than half had more than one child. Around 56 % were skilled workers and quarter of respondents came from rural areas. The highest negative impact was for Breast Cancer impact on happiness, followed by “ability to focus on daily tasks”. Sleep was the third negatively affected domain of life and “carrying out house chores” was the fourth and last domain where more than half of participants showed a negative impact. There was a high percentage of observed agreement between the calculated breast cancer impact and the perceived overall negative impact of breast cancer assessed by direct questioning. This high observed agreement was significantly beyond chance. *Conclusions:* Breast Cancer negatively impacted Quality of life. A physician in charge of patients’ management should pay attention to this when arranging a treatment plan.

Keywords: Breast Cancer, quality of life, Iraqi patients

1. Introduction

As a variant of patient reported outcomes, Quality of Life (QOL) is getting recognition as end point of clinical trials involving patients with cancer (Osoba et al., 1994).

Notoriously, Breast Cancer (BC) is the most common cause of cancer-related death among females (Key et al., 2001) with excess of more than a million inflict this disease every year (Boyle and Levin, 2008). QOL is seen as an important end point in evaluating patients with BC due to increasing incidence of the disease (Montazeri, 2008), high mortality (DeSantis et al., 2013) and impact on different health

¹ Corresponding author: Aqil Mohammad Daher
email: aqil702001@yahoo.com

domains (Boyle and Levin, 2008). BC was reported to affect physical and mental health among BC survivors. It was found that 50% of BC patients had depression and anxiety in the first year of diagnosis (Burgess et al., 2005; Ganz et al., 1996). Moreover, psychological factors and mental health were seen as major area to be considered when evaluating treatment as they impact QOL. In addition, QOL provided insight to patient's care and treatment in regards to different treatment modalities (Bottomley and Therasse, 2002). Chemotherapy was found to cause transient impairment in QOL among BC patients (Partridge et al., 2001). Late morbidity and restricted daily activities associated with BC were found to affect QOL significantly (Rietman et al., 2003).

Measurement of impact of BC has taken different forms; Objective measures that rely on health professional assessment and biomarkers that reflect deviation from wellbeing and subjective measures that reflect patient's expectations.

Instruments that have been used to measure QOL among BC patients ranged from general measures (generic) that assess health status, as such it can be used with different diseases and among general population to a more disease specific scales (Bowling, 2001) that gauge area of concerns to BC patients. Montazeri (Montazeri, 2008) and Sheila (Perry et al., 2007) have both provided comprehensive review of these instruments which have been used so far.

Although some of the famous QOL instruments has been translated into Arabic language, there is insufficient evidence of their psychometric quality (Al Sayah et al., 2013). Moreover, there is a growing concern about the utility of translated questionnaire especially when there is a great cultural differences between country of origin and that of target language (Fox-Rushby, 2000). Most of these questionnaire were developed for one culture in mind without considerable attention to future translation (Breugelmans, 2009). In addition, some bias including

construct bias and item bias are inevitable when translating or adapting health questionnaire to another language (Hambleton, 2001).

Little is known about the impact of BC on quality of life among Iraqi patients. The scarcity of data made it difficult for clinician to benchmark the new modalities of intervention that continuously made available with health care industry. The aim of this study was to develop a measure of impact of BC on QOL and to assess the impact of BC on QOL among sample of Iraqi patients.

2. Methods

2.1. Conceptualization of quality of life

The term Health related quality of life (HRQOL) emerged from the need for a measure that accommodates different views and different forms of health assessment which reflect the person's views about life with presence or absence of disease or illness. HRQOL is widely defined and conceptualized with reference to the WHO definition of health. HRQOL is a multidimensional concept reflecting the individual's subjective experience of illness and the impact that illness and its treatment has on the individual's occupational function, psychological state, social interaction and somatic sensation (Cella, 1995; Schipper et al., 1996). The philosophy underpinning the Schedule for the Evaluation of Individual Quality of Life (SEIQOL) (Joyce, 1991) and later the Audit of Diabetes Dependent Quality of life (ADDQoL) (Bradley et al., 1999) provided the framework for the design of the BCIS. The SEIQOL method asks the respondent to generate domains of importance for his/ her QOL, which are then rated for current quality. ADDQoL on the other hand provides a list of life domains that are possibly affected by the diabetes state in which patient rate the impact and importance of each life domain. BCIS was planned to

include life domains in which BC may affect QOL for the worse. A list of life domains was generated and presented for patient's rating.

2.2. Items selection

An inventory of life domains was generated from experience of QOL measurements in patients with BC. These domains were agreed upon by an expert group composed of oncologist, psychologist, and rehabilitation expert and research methodologist. The expert group identified 20 relevant life domains that are potentially affected by BC.

A sample of 15 BC patients was invited to participate in the items' selection process. The 20 domains were presented to each of the participants individually. Patients were asked to reflect on the inclusion of the listed domains. They were also asked to highlight problem in understanding the questions. Moreover, patients were asked if they think other domains, which are not listed, should be included in the newly developed scale.

Each question composed of two parts, impact of BC on life domain and the importance of that domain to the respondent. Example of the questions included:

Impact: My sickness negatively affects my ability to carry out the house chores.

Importance: For me, the ability to carry out the house chores is.

Impact of BC was rated on a 5 points Likert-type rating scale ranging from "to a very big extent" to "no effect". Importance of each domain was rated on 4 points Likert-type rating scale ranging from "very important" to "not important". Two global questions assessing QOL before and after diagnosis were rated as poor, average and good. In addition to the questions, patient-related information were sought including sociodemographic characteristics and disease related factor like disease duration, treatment modality, complications and comorbidities. The final version therefore composed of 20 life domains and two global questions.

2.3. Final instrument

The breast cancer impact scale (BCIS) was planned to include life domains in which BC may affect QOL for the worse. It was developed in Arabic language and was tested for its suitability to Iraqi patients with BC.

The instrument composed of a list of life domains which are presented for patient's rating. There are 14 life domains that were hypothesized to be affected by BC. Some domains were excluded for their sensitivity and/or irrelevancy to Iraqi culture. Each question composed of two parts, impact of BC on life domain and the importance of that domain to the respondent. Impact of BC was rated on a 5 points Likert-type rating scale ranging from "to a very big extent" to "no effect". Importance of each domain was rated on 4 points Likert-type rating scale ranging from "very important" to "not important". Two global questions assessing QOL were rated as poor, average and good. In addition to the questions, patient-related information were sought including sociodemographic characteristics and disease related factor like disease duration and treatment modality.

2.4. Patients and procedure

A sample of 240 Breast cancer patients attending Al-Amal National hospital for Cancer management was invited to participate in this study. Inclusion criteria were more than 18 years of age, diagnosed with BC for more than 1 year and being able to read and write in Arabic language. Those who didn't meet inclusion criteria or had a mental illness that impairs comprehension ability were excluded. Patients were selected through systematic random sampling technique from a list of patients attending the clinic whether presented for the first time or for follow up. Eligible patients were handed self-administered questionnaire to be filled under supervision of the investigator. The investigator was seated nearby to help

explain, clarify and direct the participants on filling the questionnaire when needed.

2.5. Statistical analyses

Descriptive statistics

Data was entered and analysed using IBMSPSS software V.21. Descriptive statistics was produced for the sample. Quantitative variables were described with mean (SD), while categorical variables were described with frequency and percentages.

2.6. Factor analysis

Principal Axis Factoring (PAF) with promax rotation of the weighted impact was used to identify the underlying factor structure of the proposed BCIS. Items of the questionnaire were entered and removed sequentially to identify the best model that describes the underlying dimensions of the scale. An item loading of more than 0.4 was considered significant to be retained. Item discriminant validity, evident with “the finding of high correlation between the item and its hypothesized construct than the correlation with other construct”. A difference of more 0.15 in the cross-loadings was considered supportive of item discriminant validity (Snell and Dean, 1992; Steiger, 1980).

2.7. Reliability

Item-internal consistency corrected for overlap represents the correlation between the item and its hypothesized scale, a value of 0.4 and more were considered satisfactory.

Internal reliability of items score was measured with Cronbach’s alpha, a value of 0.7 was deemed to be satisfactory (Nunnally and Bernstein, 1994). Test-Retest statistics including Kappa statistic and the Intraclass

Correlation Coefficient (ICC) were computed for impact, importance and for the weighted impact of each item.

2.8. Scoring

- Impact rating ranged from 5 (to a very big extent) to 1 (no effect). Higher rating reflects greater negative impact.
- Importance rating ranged from 4 (very important) to 1 (not important). Higher rating reflects greater importance.
- Weighted impact of each domain is calculated by multiplying the impact of each domain by its importance. Higher rating reflects greater negative impact of BC on QOL.
- Total score is computed by summing the weighted impact of all applicable domains, then transformed to a score of 0-100. The total transformed score was then categorized into quartiles. Higher score reflects greater negative impact of BC on QOL.

2.9. Ethics approval

The study protocol was reviewed and approved by ethics committee of college of medicine, Baghdad University.

3. Results

Table 1 shows the characteristics of the study sample. Out of the 263 invited patients, 247 responded yielding a response rate of 93.9 %. More than half were in their 50s and attained secondary education. About 60.8 % were married and more than half had more than one child. Around 56 % were skilled workers and quarter of respondents came from rural areas. In regards to treatment modality, all participants underwent surgery and more than 80% received chemotherapy.

Table 1. Characteristics of study sample

Variable		n	%
Age in years	< 50	40	19.7
	50-60	123	59.6
	60+	42	20.7
Educational Attainment	Primary	65	26.3
	Secondary	135	54.7
	University	47	19.0
Marital Status	Single	37	15.0
	Married	149	60.3
	Divorced	48	19.4
	Widow	13	5.3
Parity Status	Nulliparous	103	41.7
	Multiparous	144	58.3
Occupation	Skilled	138	55.9
	Unemployed	109	44.1
Dwelling status	Rural	62	25.1
	Urban	185	74.9
Gross monthly income	< 500000	58	23.5
	50000-1000000	119	48.2
	> 1000000	70	28.3
Chemotherapy	No	48	19.4
	Yes	199	80.6
Radiotherapy	No	236	95.5
	Yes	11	4.5
Surgery	No	0	.0
	Yes	247	100.0

3.1. Factor extraction

Out of the 20 items administered to the respondents, 14 items were retained and subjected to further factor and reliability analyses. Items that were removed due to high missing values; sexual life, menstrual

cycle, job (employment), and those did not fit the factor structure are enjoyment of holidays, worries about future and financial status.

The PAF with promax rotation showed two factors solution .These factors explained 77.66% of the total variance. High item

loading observed in each scale. The pattern of correlation supports the two factors model. Eleven of the 14 items loaded highly into one factor with loadings ranged from 0.698 to 0.994 and the remaining three items

loaded into the second one with loadings ranged from 0.538 to 0.993. The correlation coefficient between the two factors was 0.445 (Table 2).

Table 2. Factor loadings and item descriptive statistics

	Factor		Min	Max	Mean(SD)
	1	2			
Commute or travel	0.994	-.527	2.00	20.00	9.7 (4.71)
Sleep	0.891	-.323	3.00	20.00	12.44 (4.23)
Meeting family needs	0.867	.036	6.00	20.00	11.59 (4.13)
Use hands freely	0.851	.140	3.00	20.00	10.39 (5.2)
Appetite	0.833	.076	4.00	20.00	10.32 (4.66)
Focus on daily tasks	0.824	.134	6.00	20.00	12.27 (3.7)
Weight changes	0.814	.031	3.00	20.00	9.65 (4.97)
Socialise with others	0.747	.166	6.00	20.00	11.42 (4.84)
Carry out the house chores	0.735	-.010	9.00	20.00	14.12 (3.92)
Family relationship	0.735	.185	4.00	20.00	9.52 (5.39)
People's attitude towards me	0.698	.331	4.00	20.00	8.9 (4.28)
Look/physical shape	-.368	0.993	3.00	16.00	7.74 (3.82)
Self confidence	0.462	0.613	4.00	20.00	11.84 (5.54)
Happiness	0.436	0.538	8.00	20.00	15.34 (4.29)
Eigenvalues	9.007	1.866			
Variance explained	64.33	13.33			
Total variance explained	77.66				

3.2. Reliability

The item internal consistency of the first factor ranged between 0.703 and 0.887 with Cronbach's Alpha of 0.959, while those of

second factor ranged between 0.555 and 0.780 with Cronbach's Alpha of 0.829.

Kappa statistic, as shown in Table 3, was almost perfect in most instances >0.81 and was substantially high in some instance.

Table 3. Test-Retest statistics

Q	IMPACT		IMPORTANCE		Weighted
	Kappa	ICC(95%CI)	Kappa	ICC(95%CI)	ICC(95%CI)
Commute/travel	0.97	0.99 (0.98,1.00)	1	1	0.99 (0.98,1.00)
Sleep	1	1	1	1	1
Meeting family needs	0.80	0.70 (0.53,0.82)	1	1	0.75 (0.61,0.85)
Use hands freely	0.82	0.94 (0.90,0.97)	1	1	0.94 (0.89,0.96)
Appetite	0.69	0.83 (0.72,0.90)	0.97	0.92 (0.87,0.96)	0.90 (0.83,0.94)
Focus on daily tasks	0.97	0.96 (0.93,0.98)	1	1	0.95 (0.92,0.97)
Weight changes	0.8	0.91 (0.84,0.95)	0.79	0.49 (0.25,0.68)	0.87 (0.78,0.92)
Socialize with others	0.71	0.837 (0.79,0.93)	1	1	0.91 (0.85,0.95)
Carry out the house chores	0.97	0.93 (0.89,0.96)	0.96	0.96 (0.93,0.98)	0.92 (0.86,0.95)
Family relationship	1	1	*	**	1
People's attitude towards me	1	1	1	1	1
Look/physical shape	1	1	1	1	1
Self confidence	0.77	0.932 (0.88,0.96)	*	**	0.93 (0.88,0.96)
Happiness	0.82	0.89 (0.81,0.94)	*	**	0.89 (0.81,0.94)
Current QOL	1	1			
QOL before illness	-	**			

*Constant **Not computed

Perfect agreement was observed with many items. ICC was high in most cases except for the importance of weight. Current QOL demonstrated good retest reliability.

Table 4 shows the relative frequency of the BC negative impact for each domain out of the total sample. It is observable that the

highest negative impact was for BC impact on happiness then focus on daily tasks. Sleep was the third negatively affected domain of life and carrying out house chores was the fourth and last domain where more than half of participants had negative impact.

Table 4. The relative frequency of the BC negative impact for each domain

Important negative impact of the disease (n=247)	N	%
Affects happiness	184	74.49
Ability to focus on daily tasks	158	63.97
Affects sleep	143	57.89
Ability to carry out the house chores	131	53.04
Affects willingness to socialise with others	87	35.22
Affects self-confidence	82	33.20
Ability to meet family's needs	71	28.74
Ability to use my hand/both hands freely	71	28.74
Ability to commute or travel	70	28.34
Affects body weight (gain/ loss)	69	27.94
Affects appetite	64	25.91
Affects people's attitude towards me due to perceived stigmatization	57	23.08
Affects family relationship (husband, children)	51	20.65
Affects appearance/physical shape	35	14.17

Table 5 shows the total BCI score and overall rating of QOL. It is shown that being majority of the participants had medium negative impact of BC while around 13.6 % had high negative impact. Global rating of

QOL was comparable to BCI score categories, where just more than a half reported average QOL and around fifth described their QOL as good.

Table 5. BC impact total score

BC impact total score (/100)	N	%
Low negative impact (<25)	51	20.8
Medium (30-74.9)	163	65.6
High negative impact (75+)	33	13.6
Currently perceived quality of life		
Poor quality	62	25.2
Average quality	134	54
Good quality	51	20.8

The agreement between overall QOL rating and the BCI score was shown in Table 6. There was high percentage of observed

agreement which was significant beyond chance.

Table 6. Agreement between perceived quality of life and BC impact total score

Currently perceived quality of life	BC impact total score (/100)-categories			Total
	High negative impact (75+)/poor QOL	Average (30-74.9)/ average QOL	Low negative impact (<25)/ good QOL	
	N	N	N	
Poor quality	34	29	0	63
Average quality	0	133	0	133
Good quality	0	0	51	51
Total	34	162	51	247

Observed percent agreement=90% Kappa (agreement beyond chance) = 0.796P<0.001

4. Discussion

The current study reports on the impact of BC on QOL. QOL studies are getting recognition with the advance of technology and modern management modalities to reflect patient satisfaction and expectations.

Identifying area of concerns to the patient and health professional would help suggesting means to improve disease outcome and reduce patient’s suffering. Particularly, that the BC burden from developing countries is not well-understood due to lack of systematic quantification of this health problem (Shulman et al., 2010).

It is well documented that different method of factor extraction and rotation would yield different factor structure (Kim, 2008). Principal component analysis uses the total variance to reproduce factors, while common factor analysis decomposes the shared variance to identify underlying constructs. The use of principal axis factoring with promax rotation was warranted in this study with the assumption that the underlying subscales would correlate (Nunnally and Bernstein, 1994).

We have attempted different method of computing missing values of the non-applicable domains, namely sexual life,

menstrual cycle and employment. Inevitably, they were removed. Although three quarters of the respondents were married, it was not unexpected that respondent didn’t endorse sexual life domain due to sensitivity of such question in eastern Muslim culture (Dwairy, 2006; Gerholm, 2003) as was indicated in the debriefing session. Similarly revealing information about menstrual cycle would be seen as flagrant by the patients. Such items might be applicable in other cultures like the western. Although half of our sample was skilled, impact of BC on ability to do the job was removed during analysis due to high missing values that would degrade any method of scale analysis.

The use of patient’s weighting of the impact of disease on each life domain seems advantageous. Firstly it identifies area most influenced in BC that needs to be addressed. Secondly, the weight is patient-oriented unlike the regression weight derived from the sample and applied to each participant. Thirdly, it increases the range of the score allowing better discrimination between different quality of life strata.

Referring to the reliability of the scale, it was observed that many variables had perfect Kappa and ICC statistics, some item were constant, which reflects stability of the measure. It is worth to mention in this

argument that the importance of three items was uniform across the 50 participants who repeated the questionnaire. Happiness, family relationship and self-confidence were rated as very important in both test and test-retest steps. The results might be explained in relation to the role of the female as a spouse, mother, care giver and as a family pillar who is pivotal to ameliorate and support the family, thus these aspects are of unaltered importance. BC was reported to exert great psychological impact on female patients (Ganz et al., 1996). Nonetheless, BC does not only impact the woman but also the whole family considerably (Montazeri, 2008).

Assessing the reliability of the two global items showed that the current QOL item exhibited better reliability and was retained in the final version. While QOL before BC diagnosis failed to maintain its position as a reliable measure. This might be attributed to the fact that patients tend to forget what happened prior to the diagnosis.

Interestingly, majority of the participants were older than 50 years old. This might reflect the trends of occurrence of BC among Iraqi females. Nonetheless, with absence of national data, it might be difficult to make assumption about incidence of BC in Iraq.

Happiness is usually the most area affected not only in BC but most of end life disease which comes along with psychological morbidities (Peled et al., 2008).

BC was reported to exert great psychological impact on female patients (Ganz et al., 1996). The struggle with serious disease, attempt to remain active within the family and the impact on self-image have substantial psychological effect on BC patients (Abu-Helalah, et al., 2014; Council, 2004). Moreover, BC does not only impact the woman but also the whole family considerably (Montazeri, 2008). Our results are similar to those from Jordan in which patients had high social function level but lower emotional function (Abu-Helalah et al., 2014).

Our results are in line with published reports about the impact of BC on the quality and pattern of sleep. It is well documented that treatment modality contribute to sleep disturbances among BC (Costa et al., 2014). The reported prevalence of sleep disturbance ranged from 20% to as high as 70% among BC survivors. The actual mechanism stipulates that three main factors contribute to insomnia, these are ; predisposing (female sex, older age and family history), precipitating (pain, stress and concomitant menopausal symptoms) and perpetuating factors mainly maladaptive sleep habits like napping during the day and spending longer time in the bed (Bower, 2008; Girschik, Heyworth and Fritschi, 2013; Savard and Morin, 2001).

Focus on daily tasks and carrying household chores are seen as a crucial aspect for many women, as their family roles are plentiful. Literature has documented the association of such role and health (Arber and Khlal, 2002). Linked to psychological impact of BC along with sleep disturbances, it is expected that BC survivors would suffer lack of focus on their daily task which affect their QOL adversely.

On the other hand, the impact of BC on physical domain in terms of fatigue, post-therapy nausea and vomiting, poor appetite in addition to sleep disturbance contribute to significant impact on ability to carry out house chores and work-related activities (Ahn et al., 2009). Both biological makeup and social role of women (Page and Adler, 2008) are recognized as moderating factor that jeopardizes female health. A different perspective might arise in countries where maids play a major role in maintaining the home. The results of this study come in line with other studies in which physical function was not significantly affected (Cohen et al., 2012; Doorenbos et al., 2006).

It was not unexpected to find that family relations (with spouse), stigmatization-related society reaction and physical appearance were the least affected domains.

Arabic culture is well-known of its solidarity that is tightened with religious values. Reports showed the importance of public good dimension of health a society adopts for the sake of health (Illingworth and Parmet, 2015). Social domain was not affected among our sample which comes in line with other studies (Goodwin, 2003; Goodwin et al., 2004).

Although all participants underwent surgery but less than fifth reported negative impact of BC on physical appearance. This might reflect high self-confidence, better adjustment to disease conditions or that the appearance is not observed by others or not relevant anymore. Although data was not collected in this study, conserving surgery or mastectomy with reconstructive approach was found to confer better outcome compared to mastectomy (Markopoulos et al., 2009; Ueda et al., 2008).

Studies on QOL among BC survivors reported similar impact on different life domain where coping style, social support and less-physically demanding treatment are the main mediators of patients satisfaction (Elder et al., 2005; Thind et al., 2011).

It is pertinent to mention that the domains that were identified as relevant in Iraqi culture might not necessarily be the same for BC patients from other countries and or a different culture. The concept of health and illness is admittedly inherent within cultures, and social norms for most of communities (Bircher, 2005; Helman, 2007; Nash, 2012). Level of literacy, reading and comprehension abilities, and exposure to questionnaire affect questionnaire response (Al-Tayyib et al., 2002; Sartorius and

Kuyken, 1994). Optimum measures may necessitate a combination of generic and specific measures to better understand the scope of impact of BC.

5. Conclusions

BC negatively impacted QOL. Happiness, focus on daily task, sleep and carrying out house chores are the most widely affected aspect of life. A physician in charge of patients' management should pay attention to this when arranging a treatment plan.

Although a systematic approach was followed in conducting this study, some limitations have surfaced. The exclusion of some originally 14 domains suggested in the planning phase of the study instruments (like sexual life, employment, and worries about future that were excluded by factor analysis) might limit the possibility of translating the question for the use in in other cultures or ethnic groups. In addition, quantitative approach using disease specific questionnaire might conceal other aspects that are better manifested using qualitative approach. A Cross-sectional study might not reflect the changes in QOL. Therefore the authors recommend a follow study (using the same cohort of patients if possible) in order to explore factors affecting QOL and possible approaches to improve it. We also recommend a combination of quantitative and qualitative methods for data collection.

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Aqil M. Daher

National Defence University
of Malaysia,
Faculty of Medicine and
Defence Health
Sungai Besi Camp
57000 Kuala Lumpur
Malaysia
aqil702001@yahoo.com

Tahseen A. Al-Rubai

Alwiyh, Ministry of Health,
Al-Amal National hospital
for cancer management
Baghdad
Iraq
tahseenalrubai@yahoo.com

Ahmed S. Al-Nuaimi

Baghdad University,
College of medicine
Bab al-Moadham
Baghdad
Iraq
ahmedihss2@gmail.com

Ameel F Al-Shawi

Al-Mustansiriya University,
College of Medicine
Al-Yarmuk
Baghdad
Iraq
ameelalshawi@gmail.com

Usama Medhat

Baghdad University,
College of medicine
Bab al-Moadham
Baghdad
Iraq
usmed2005@gmail.com
