

PAPER • OPEN ACCESS

The Impact of Six Decades of Trauma on the Health of Iraqi People

To cite this article: Hikmet J Jamil *et al* 2019 *J. Phys.: Conf. Ser.* **1294** 062101

View the [article online](#) for updates and enhancements.



IOP | ebooks™

Bringing you innovative digital publishing with leading voices to create your essential collection of books in STEM research.

Start exploring the **collection** - download the first chapter of every title for free.

The Impact of Six Decades of Trauma on the Health of Iraqi People

Hikmet J Jamil¹, Manhel R A Albahri², Nadia Al-Noor³, Taghreed Al Noor⁴ and Thamer Hamdan⁵

¹ Michigan State University, Department of Family Medicine, Michigan, U.S.

² Wayne State University, Department of Nutrition and Food Science, (PhD Chemistry as volunteer adjunct faculty), Michigan, U.S.

³ Mustansiriyah University, Department of Mathematics, College of Science, Baghdad, Iraq.

⁴ University of Baghdad, Department of Chemistry, Education for Pure Science College, Ibn Al-Haitham, Baghdad, Iraq.

⁵ University of Basra, Department of Surgery, Basra Iraq.

E mail : hikmet.jamil@gmail.com

Abstract. Over the course of six decades, Iraq exposed to many events that have affected the Iraqi people from the social, physical and mental aspects. In this study, two groups of people (2369), from Iraq (G1) and the Michigan, United States (U.S) of America (G2) selected to compare the prevalence rate and effects of trauma factors such as mental illness (anxiety, depression and PTS), somatic diseases (heart disease, hypertension, and diabetes), substances abuse (illicit drugs, alcohol and tobacco), and chemicals pollution), and self-rated health among the two groups. The study results reveals a significant different between the two groups in the all indicators for trauma. The study conclude that Iraqi in U.S. (G2) suffer from factors completely differed from that Iraqi who are resident in Iraq (G1).

Key Words: Substance Abuse, Mental diseases, Somatic Diseases, Self-rated Health, Iraq.

Introduction:

Iraq is a Mesopotamia, “the land between the two rivers”, Tigris and Euphrates (1). It has also become the center of attention in modern political and military conflicts (1).

People in Iraq have experienced a continuing traumatic history during the last six decades. Starting 1958 with military revolution in changing the Royal regime to Republic regime, followed by Bath Party regime in 1963, followed by military government then Bath party come to the government in 1968. In 1980, Iraq has war with Iran, followed invasion of Kuwait in 1990, then suction on Iraq, from 1991 until 2003, when U.S. and its allied invade Iraq. This followed by civil war, with Islamic Sector of Iraq and Sham (ISIS) till 2017 officially, together with political and religious violence & oppression, forced displacement and migration, human right abuses, unemployment, and poverty have scourged Iraqi society, creating major public mental health crises (1-4). Because of such high levels of armed violence, millions of Iraqis, particularly young people, have been killed or injured (3, 4). More than 4 million Iraqis forced to leave their homes, either internally displaced, or becoming refugees in neighboring countries. In addition, the educational and health systems failures in



Content from this work may be used under the terms of the [Creative Commons Attribution 3.0 licence](https://creativecommons.org/licenses/by/3.0/). Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.

particular have affected the wellbeing of Iraqis (5-7). However, such traumatic events produce large adverse scale on physical and mental health especially among adolescents, as they are vulnerable groups for adverse effects of wars and community violence (8, 9). However, in Iraq, there is a unique situation of conflict consisting of a combination of war, terrorism, and sectarian violence (10, 11). Such environmental condition will be vulnerable sect of our society, in developing mental disorders such as depression and stress disorders, which increase the chances of using alcohol and illicit drugs (12-14).

However, the Iraqi refugees as other are escaping a war-torn region with an elevated risk of pre-displacement trauma (15). Among the most important challenges refugees face upon arrival in the host country is finding gainful employment. Surprisingly, research suggests the chances of employment have little to do with how severely refugees traumatized in their country of origin (16, 17). In a meta-analysis, Porter and Haslam (2005) found a robust relationship between poor refugee mental health and limited economic opportunities in the host country, suggesting that both pre-displacement factors, such as trauma exposure in the country of origin, and post-displacement factors, such as unemployment, contribute to poor mental health in refugees (18).

The study objectives are: (1) to explore the prevalence rate of trauma through examine (a) mental diseases, (b) some somatic diseases, (c) substance abuse and, (d) self-rated health (SRH) in Iraqis residents at South of Iraq (G1), and Iraqis residents at Michigan, U.S. (G2). The second objectives are: to explore risk factors for (a) mental diseases, (b) somatic diseases, (c) substance abuse, and (d) wellbeing (self-rated health), in Iraqis at G1 and G2. We hypothesize that: Iraqis in G1 will (a) suffer more mental disease; (b) have higher somatic diseases, (c) use more substances abuse especially illicit drugs, and (d) have worse health compared to Iraqis at G2.

Methods:

Data from five previous researches selected for this study (19-23), all of them based on random sample. Only male Iraqi people selected, three out of the five researches the participants consented and responded to an interview in Arabic using a validated structured survey, the other two studies based on charts review from clinics of primary healthcare physicians who is Iraqi in origin. Four studies conducted in Michigan, U.S and one in South of Iraq where only male were included in the study because it was plan for that research to compare the results with American veteran who participates in Gulf-war 1991 and as no Iraqi woman were participates in the Iraqi army who were involve in Gulf-war 1991. Variables related to study objective selected and if it was not available in any studies count as missing data. The total study population of 2369 (1155 resident in Iraq and will called "G1" and 1214 in Michigan, U.S., which form four studies). Applying "ANOVA" analysis for the four studies reveal no significant differences between them (Table 1), so were combined and called "G2". The selected data covered questions related to socioeconomic, suffered from one or more of defined physician-diagnosed somatic diseases (Heart problems, Hypertension and Diabetes), these three somatic diseases were chosen because could resultant from the impact of continuous trauma on the people, in addition to mental diseases (Depression, PTSD and Anxiety), and substance abuse (Illicit drugs, Alcohol and Tobacco). The Illicit drugs included several items (sedative, stimulant, pain killers for non-medical reasons, inhalants such as glue or aerosol sprays, cocaine, crack, hallucinogens, and marijuana or hash). All participants were exposing to different level of chemical and non-chemical (Stressors) environmental pollution during the period starting 1958 to 2007 (date of the last data collection of these studies) but only three of these study (one in Iraq and two in U.S.) the participants reported their exposure to chemical pollution and two for non-chemical environmental pollution during Gulf-war 1991. The respondents rated their self-rated health (SRH) using a like-type respond scale. All participants of the three studies (two of G2 and G1) accept to participate volunteer, sign consent forms, and all five studies have Institute Review Board approval from Wayne State University and Basra University. Different types of statistical analysis were used (E.g. Chi-square, ANOVA) and significance was set to a p-value of <0.05.

Results:

Table 2 reveals significant differences between the two group (G1 and G2), in all variables. The mean (SD) age, of study population (2369), was 38.6(14.8), G1 were 62.4% married, 76.9% unemployed, which were mainly among G1 and also daily life stress were mainly on G1 (85.8%) while G2 reported higher exposure to chemical environment pollution (58.6%) and non-chemical environmental /stressors (53.1%); Table 3A reveals significant differences between the two groups in the three mental diseases studied. The G2 group showed higher prevalence in PTSD (5.5%) and Anxiety (14%) compare to G1 group, while table 3B shows that Binary logistic regression analysis that predicts risk factor for combined mental diseases (E.g. G2, and employed). Table 4A, reveals a significantly higher prevalence rate of all somatic diseases, in G2 group compare to G1 group. While table 4B shows that Binomial logistic regression analysis predicts two risk factors for combined somatic diseases (those with one or more mental diseases and those with poor to bad health). Table 5A reveals prevalence rate of substance abuse with significant differences between the two groups in all substance abuse. G1 was higher in smoking tobacco (51.3%), using illicit drugs (5.6%), while G2 was higher in drinking alcohol (28%). However, table 5B shows that Binary logistic regression analysis that predicts eight risk factors for combined substance abuse (e.g. G1, < H.S., employed, have daily life stress). Table 6A reveals that 39.4% of G2 group reported poor to bad health compare to 12.9% of G1 group, and the different was significant, while table 6B shows that Binary logistic regression analysis predicts four risk factors for excellent to good health (E.g. G1, no somatic or mental diseases).

Discussion:

The study hypotheses for having higher prevalence rate of mental diseases among G1 group was accepted for depression (37.2% for G1 vs. 30% for G2) but rejected for PTSD and anxiety (table 3A); also it was rejected for all somatic diseases studied because the prevalence rate were higher among G2 group (table 4A). The Study hypotheses, accepted as it reveals the prevalence rate of using certain substance abuse (smoke tobacco and use illicit drugs) but it was rejected for drinking alcohol (table 5A). While the hypothesis, was rejected for wellbeing as 39.4% of G2 group reported poor to bad health compare to 12.9% of G1 group (table 6A). Although both groups (G1 and G2) were Iraqis, but there were significant differences in their characteristics variables (table 2); mental diseases (table 3); somatic diseases (table 4); substance abuse (table 5) and even when they report their health (table 6). This different could due to several factors. However, G2 group left Iraq as either refugees or immigrants, seeking safer place and better life. G2 did not expect to phase daily life problems, which completely differ from its original country. The major problems could summarize as women right, child right, their profession not licenses, find a job. On other hand G2 have more access to healthcare where its health problems could diagnosed. This could explained why G2 group have higher prevalence rate in all somatic diseases, PTSD and anxiety in addition to drink more alcohol as well as to rate his health as poor too bad. On the other hand, G1 group who live in Iraq remain exposed to different types of trauma, which acclimatize him and make its daily environment as normal. This why we found G1 have higher rate of depression, smoking tobacco and using illicit drugs as well as report better health compare to G2. The results predict risk factors for exploring trauma disorders, which measured, by mental diseases, some somatic diseases, using substance abuse and wellbeing of the study population (Self-rated health). We used Binary logistic regression analysis in each of the four indicators. The results shows that the risk factors for combined mental diseases were those who are in G2 group, have somatic diseases, using substance abuse, and those employed (table 3B), while the predictor factors for somatic diseases were those who have mental diseases and reporting poor to bad health (table 4B). The risk factors for combined substance abuse were G1 group, older age, married/other, held less. High school, employed, have somatic diseases and mental diseases in addition to daily life stress (table 5B), while the predictor risk factors for excellent to good health were G1, have no mental diseases or somatic diseases and did not exposure to chemical environment (table 6B). Although G1 group reported better health than G2, but in reality is not because the

infrastructure of health and education in particular and other systems in general nearly destroyed after 2003. Expertise of authors as faculties at Iraqi University and two of them worked at Ministry of health and one of them worked more than 20 years in U.S. at university and community organizations which have contact with Iraqis make them were aware about what is going in the Iraq in the last six decade. All authors confident to say that health of Iraqis does not reflect what G1 reported to be healthier than G2 as research indicate the infant mortality in Iraq is very high (24, 25), and the prevalence rate of somatic diseases studied is also high (23), compare to other nation. Our results in general agree with other studies whose participants expose to different trauma or violence especially those who left their own countries (8-14, 16-18).

Study strength and limitation:

The study strength was (a) the original data files of the five studies were reserved at the first author. (b) The population of the five studies based on random samples. (c) The study population was all Iraqis sharing same environment and similar cultures even those who emigrated to U.S. (G2). (d) "ANOVA" analyses for the four studies, which make G2, reveal no significant differences between them (Table 1). (e) No similar published study that approaches the long-term impact of trauma on Iraqis who are residents in Iraq and compare them to Iraqis who left Iraq to a new host country (U.S.). The study limitation was (a) this study was not design for its objective, but its variables information collected from five published studies. (b) There were differences in the date of data collection of these studies especially among those who left to U.S. (G2). (c) The study population of G1 was resident at the South of Iraq while the population of G2 who immigrated to U.S was residents at different provinces of Iraq.

Conclusion:

The results showed that Iraqi who were resident in U.S. (G2) have higher prevalence rate of all somatic diseases studied and two out of mental diseases and substance abuse compared to G1. In addition, G2 reported worse health than Iraqis who are residents in Iraq (G1). Several risk factors predicted for mental diseases, somatic disease, substance abuse and self-rated health, which could help the policy maker to improve the wellbeing of Iraq in general and those who are still residents in Iraq in particular especially if the government considers rebuilding of health and educational system in particular and all the other infrastructure of the country.

Table 1A. ANOVA analysis for the four studies

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	820556.075	3	273518.692	7.562	.000
Within Groups	1302041.300	36	36167.814		
Total	2122597.375	39			

1B. Multiple Comparisons

		95% Confidence Interval				
(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1.00	2.00	289.10000*	85.05035	.002	116.6099	461.5901
	3.00	343.50000*	85.05035	.000	171.0099	515.9901
	4.00	346.90000*	85.05035	.000	174.4099	519.3901
2.00	1.00	-289.10000*	85.05035	.002	-461.5901-	-116.6099-
	3.00	54.40000	85.05035	.526	-118.0901-	226.8901

	4.00	57.80000	85.05035	.501	-114.6901-	230.2901
3.00	1.00	-343.50000-*	85.05035	.000	-515.9901-	-171.0099-
	2.00	-54.40000-	85.05035	.526	-226.8901-	118.0901
	4.00	3.40000	85.05035	.968	-169.0901-	175.8901
4.00	1.00	-346.90000-*	85.05035	.000	-519.3901-	-174.4099-
	2.00	-57.80000-	85.05035	.501	-230.2901-	114.6901
	3.00	-3.40000-	85.05035	.968	-175.8901-	169.0901

*. The mean difference is significant at the 0.05 level.

Table 2. Percentage¹ of variables by Study Group

Variable	Sub variable	G1 (n=1155)	G2 (n=1214)	Total (n=2369)
Age	Mean(SD)	28.5(7.4)	47.5(14.0)	38.6(14.8)
		%	%	%
Marital Status	Single	37.6	28.7	33.1
	Married/other	62.4	71.3	63.7
Education	< H.S	59.4	55.8	57.6
	HS +	40.6	44.2	42.4
Work	No work	95.9	63.8	76.9
	Employed	4.1	36.2	23.1
Daily Stress of Life	No disease	14.2	32.9	21.3
	Stress of life	85.8	67.1	78.7
Chemical _Exp.	No	81.8	41.4	73.7
	Chemical Exp.	18.2	58.6	26.3
Non-Chemical Exp.	No Exp.	80.8	46.9	75.9
	Non-Chemical Exp.	19.2	53.1	24.1

* P range between 0.01 - 0.001
¹Percentage base on the available data on each variable

Table 3A. Prevalence¹ of Mental Diseases by Group Studied

Mental Disease	G1 (n=1155)	G2 (n=1214)	Total (n=2369)
Depression*	37.2	30.0	33.6
Anxiety*	10.1	22.7	14
PTSD*	0.5	3.6	5.5

* P < 0.001

¹Prevalence based on the available data on each variable (total population for depression = 2307, for PTSD = 1863, for anxiety = 1665)

3B. logistic regression analysis to predict risk factors for Combined Mental Diseases

Risk Factor	B	Sig.	OR	95% C.I. for OR	
				Lower	Upper
G2	-1.40	0.000	0.25	0.15	0.39
one or more somatic dis	0.70	0.000	2.02	1.36	2.99
One or more substance abuse	-0.46	0.001	0.63	0.48	0.83
Employed	0.77	0.004	2.15	1.27	3.63

Variables in equation: age, marital status, employment status, education, substance abuse, somatic disease, daily life stress, chemical exposure, non-chemical exposure, two groups study and SRH

Table 4A. Prevalence¹ of Somatic diseases by Group Studied

Somatic Disease	G1 (n=1155)	G2 (n=1214)	Total (n=2369)
Hypertension*	9	19.5	14.3
Heart Problems*	2.3	9.2	5.8
Diabetes*	2.8	12.2	7.1

* P range between .01 - 0.001

¹Prevalence based on the available data on each variable (total population for hypertension = 2321, for heart problems = 2312, for diabetes = 2113)

4B. logistic regression analysis to predict risk factors for Combined Somatic Diseases

<u>Risk Factor</u>	<u>B</u>	<u>Sig.</u>	<u>OR</u>	<u>95% C.I. for OR</u>	
				<u>Lower</u>	<u>Upper</u>
Poor to Bad	0.87	0.000	2.40	1.60	3.60
One or more Mental dis	-0.63	0.002	0.53	0.36	0.79

Variables in equation: age, marital status, employment status, education, substance abuse, mental diseases, daily life stress, chemical exposure, non-chemical exposure, two groups study and SRH,

Table 5A. Prevalence¹ of substance abuse by study group

<u>Substance Abuse</u>	<u>G1 (n=1155)</u>	<u>G2 (n=1214)</u>	<u>Total (n=2369)</u>
Smoke Tobacco	51.3	40.7	46.1
Drink Alcohol	1.9	28	8.7
Use Illicit drug	15.6	11.5	14.5

* P range between .01 - 0.001

¹Prevalence based on the available data on each variable (total population for smoke tobacco 2234, for alcohol = 1562, for illicit drugs = 1572)

5B. Logistic regression analysis to predict risk factors for Combined Substance Abuse

<u>Risk Factor</u>	<u>B</u>	<u>Sig.</u>	<u>OR</u>	<u>95% C.I. for OR</u>	
				<u>Lower</u>	<u>Upper</u>
G1	1.10	0.000	3.01	1.89	4.78
Age	0.02	0.022	1.02	1.00	1.04
Married/Other	0.28	0.048	1.32	1.00	1.74
Have less than H.S.	-0.30	0.027	0.74	0.57	0.97
Employed	1.08	0.000	2.95	1.78	4.89
Have stress of life	0.38	0.022	1.47	1.06	2.04
One or more Mental dis	0.47	0.001	1.60	1.21	2.12
one or more somatic dis	0.40	0.039	1.50	1.02	2.20

Variables in equation: age, marital status, employment status, education, mental diseases, somatic diseases, daily life stress, chemical exposure, non-chemical exposure, two groups study and SRH.

Table 6A. shows significant difference in reporting Self-rated Health by the Group Studied

<u>SRH</u>	<u>G1 (n=1155)</u>	<u>G2 (n=1214)</u>	<u>Total (n=2369)</u>
Excellent	4.3	6.3	5.2
Very good	21	17.9	19.6
Good	61.7	36.3	50.7
Poor	11	28.3	18.6
Bad	1.9	11.1	5.9

6B. Logistic regression analysis to predict risk factors for Excellent to Good Health

<u>Risk Factor</u>	<u>B</u>	<u>Sig.</u>	<u>OR</u>	<u>95% C.I. for OR</u>	
				<u>Lower</u>	<u>Upper</u>
No Chemical Exp.	0.97	0.000	2.64	1.80	3.87
No Somatic_ Disease	-0.90	0.000	0.41	0.27	0.61
No _Mental Disease	0.73	0.000	2.06	1.42	3.01
G1	0.91	0.000	2.49	1.50	4.13

Variables in equation: age, marital status, employment status, education, substance abuse, mental diseases, somatic diseases, daily life stress, chemical exposure, non-chemical exposure, two groups study.

Acknowledgement:

Professor Jamil as the first author on the five published articles of these studies would like to acknowledge all the co-authors who participate in these articles.

References:

- [1] Sharma S, Piachaud J (2011) Iraq and mental health policy: a post invasion analysis. *Intervention* 9: 332-344.
- [2] Iraq report. On the road to recovery. *Middle East Health Magazine* 2012. <http://www.middleeasthealthmag.com/cgi-bin/index>. (Accessed March 14, 2018).
- [3] Hicks MH, Dardagan H, Guerrero Serdan G, Bagnall PM, Sloboda JA, et al. (2011) Violent deaths of Iraqi civilians, 2003-2008: analysis by perpetrator, weapon, time, and location. *PloS Med* 8: e1000415.
- [4] Hicks MH, Dardagan H, Bagnall PM, Spagat M, Sloboda JA (2011) Casualties in civilians and coalition soldiers from suicide bombings in Iraq, 2003-10: a descriptive study. *Lancet* 378: 906-914.
- [5] Refugees International (2008) Uprooted and unstable: meeting urgent humanitarian needs in Iraq.
- [6] Al-Obaidi AK (2011) Iraq Children and adolescents' mental health under continuous turmoil. *International Psychiatry* 8: 5-6.
- [7] AlShawi AF, Lafta RK. (2014) Relation between childhood experiences and adults' self-esteem: A sample from Baghdad. *Qatar Medical Journal*, 14: 82- 91.
- [8] Al-Jawadi A, Abdul-Rhman S. (2007) Prevalence of childhood and early adolescence mental disorder among children attend ending primary health care centers in Mosul, Iraq: a cross-sectional study: *BMC.*, 7: 274.
- [9] Ahmed SA. (2007) Post-traumatic disorders, resilience and vulnerability. *Advance in Psychiatric Treatment*. 13:369-375.
- [10] Khalil A. Hussien Aljurany (2013) "PERSONALITY CHARACTERISTICS, TRAUMA AND SYMPTOMS OF PTSD: A POPULATION STUDY IN IRAQ", Submitted for the degree of Doctor of Philosophy Heriot-Watt University School of Life Sciences /Applied Psychology July 2013.
- [11] Perkonig, A., Kessler, R. C., Storz, S., & Wittchen, H.-U. (2000) Traumatic events and post-traumatic stress disorder in the community: Prevalence, risk factors and co-morbidity. *Acta Psychiatrica Scandinavica*, 101(1), 46-59.
- [12] Magaña CG, Hovey JD (2003) psychosocial stressors associated with Mexican migrant farm workers in the Midwest United States. *Journal of Immigrant Health* 5: 75-86.
- [13] Ross HE, Glaser FB, Germanson T (1988) The prevalence of psychiatric disorders in patients with alcohol and other drug problems. *Archives of General Psychiatry* 45: 1023-1031.
- [14] Nesif Al-Hemary, Jawad Al-Diwan, Albert Hasson, Richard A. Rawson, (2014), "Drug and Alcohol Use in Iraq: Findings of the Inaugural Iraqi Community Epidemiological Workgroup", 49(13): 1759–1763. Doi: 10.3109/10826084.2014.913633. PMID: PMC4431571, NIHMSID: NIHMS687564, PMID: 24827867.
- [15] MICHELLE WRIGHT A., ABIR DHALIMI, MARK A. LUMLEY, HIKMET JAMIL, NNAMDI POLE, JUDITH E. ARNETZ and BENGT B. ARNETZ, (2016), "Unemployment in Iraqi refugees: The interaction of pre and Post-displacement trauma", *Scandinavian Journal of Psychology*, DOI: 10.1111/sjop.12320 <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4431571/pdf/nihms687564.pdf>
- [16] Schweitzer R., Melville F., Steel, Z. & Lachare, P. (2006) Trauma, post-migration living difficulties, and social support as predictors of psychological adjustment in resettled Sudanese refugees. *Australian and New Zealand Journal of Psychiatry*, 40, 179–187.
- [17] Teodorescu D., Siqueland J., Heir, T., Hauff, E., Wentzel-Larsen, T. & Lien, L. (2012). Posttraumatic growth, depressive symptoms, posttraumatic stress symptoms, post-migration stressors and quality of life in multi-traumatized psychiatric outpatients with a refugee

- background in Norway. *Health and Quality of Life Outcomes*, 10. Doi: 10.1186/1477-7525-10-84.
- [18] Porter, M. & Haslam, N. (2005). Pre-displacement and post displacement factors associated with mental health of refugees and internally displaced persons. *Journal of the American Medical Association*, 294, 602–612.
- [19] Jamil, H., Nassar-McMillan, S., Salman, W. S., Tahar, M., & Jamil, L. H. (2006). Iraqi Gulf War Veteran Refugees in the U.S.: PTSD and Physical Symptoms. *Journal of Social Work Health Care*, 43 (4): 85-98
- [20] Jamil, H., Farrag, M., Hakim-Larson, J., Kafaji, K., Abdulkhaleq, H., & Hammad, A. (2007). Mental Health Symptoms In Iraqi Refugees: Posttraumatic Stress Disorder, Anxiety, and Depression, *Journal of Cultural Diversity*, 14 (1) :19-25
- [21] Jamil, H., Fakhouri, M., Dallo, F., Templin, T., Khoury, R., & Fakhouri, H. (2008). Self-Reported Heart Disease among Arab and Chaldean American Women Residing in Southeast Michigan. / *Ethnicity and Disease Journal*, 18 (1):19-25. PMID: 18447094
- [22] Jamil, H., Ventimiglia, M., Mahmoud, R., & Arnetz, B. B. (2009). Somatic and Psychiatric Disorders and Health Care Utilization among Iraqi Refugees and Yemeni Immigrant, *The New Iraqi Journal of Medicine*, 5 (3): 14- 22
- [23] Jamil, H., Hamdan, T. A., Grzybowski, M., Arnetz, B. B. (2011). Health Effects Associated with Geographical Area of Residence During the 1991 Gulf War: A Comparative Health Study of Iraqi Soldiers and Civilians. *The Army Medical Department Journal*, July-Sept, 86-95. PMCID: PMC3159173
- [24] Child Mortality in Iraq since 1990, (2006), https://www.jstor.org/stable/4418840?seq=1#page_scan_tab_contents
- [25] Iraqi infant mortality soars by 150 percent—a damning revelation of US war crimes, (2007), <https://www.wsws.org/en/articles/2007/05/iraq-m09.html>