

Quality of online information on type 2 diabetes mellitus in Arabic language websites[†]

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ABSTRACT

The Internet has become a major source of health information. However, the accuracy and quality of this information might be questionable. The aim of this study was to evaluate the quality of online information on type-2 diabetes on Arabic websites. In this cross-sectional study, the term “type-2 diabetes” in the Arabic language was fed to popular search engines. The first 25 hits from each engine were considered. A list of 50 websites was evaluated in terms of formal quality, usability and accuracy of the information provided by the website. The average percentage of quality standards (QS) achievement of the evaluated websites was 31.6% (min=7 (15.9%) and max=28 (63.6%)). The author was identified in 40% of the websites; however the percentage of showing his/her affiliation, expertise and credentials were 18, 10 and 10% respectively. Only 12% of the websites provided information written by healthcare providers. Only half of the websites described the disease, and only 22% discussed the treatment options. This study demonstrates a lack of credibility and low quality for the information on type-2 diabetes mellitus provided by the majority of websites in the Arabic language.

Keywords: Type 2 diabetes mellitus, Online, Arabic, health, information, Quality.

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INTRODUCTION

During the last decades, people especially young adults are increasingly using the internet as a source of information. Health information is one of the most frequently sought topics. In the United States, it is estimated that half of the patients are feeling comfortable using the Internet as a health information resource (1), while 70% of the Canadians go online to search for medical or health-related information, and it has been reported that the Internet, rather than physicians, is the first source of information for many people (2). In France, over 48.5% of the web users used the Internet for health purposes (3), compared to 75% in India (4). Research carried out by the Oxford Internet Institute has shown that 71% of the UK population have sourced health information online (5).

The use of the Internet as a source of health information has different advantages, including convenient access to a massive volume of information, ease of updating information, and the potential for interactive formats that promote understanding and retention of information. However, the quality of information on the Internet is essential. Accurate relevant information is beneficial, while inaccurate information could be harmful (6, 7).

Diabetes mellitus is among the major chronic diseases worldwide. The disease burden is high and rising over the years(8). The latest estimates show a global prevalence of 382 million people with diabetes in 2013, expected to rise to 592 million by 2035, with type 2 diabetes accounting for the majority (>85%) of total diabetes prevalence. Both forms of diabetes can lead to

multisystem complications of microvascular endpoints, including retinopathy, nephropathy and neuropathy, and macrovascular endpoints including ischaemic heart disease, stroke and peripheral vascular disease (9).

A well-informed patient is better able to become an active participant in the process of health care. Self-management and shared decision-making between the patient and physician are two main aspects of patient involvement. Self-management means that the patient successfully copes with the challenges of living with and treating diabetes (Wagner *et al.*, 2001). As the patient might use the internet as a source for his information, the quality of the information the patient gets must be assured. In a cross-sectional study performed in 2015, Weymann *et al.*, assessed the quality of online information on type 2 diabetes in English and German language websites focusing on 3 domains; formal quality, usability and quality of decision support. They found great variability between the websites (10).

The prevalence of DM-2 in Arab world countries is high and affects more than 25% of the population in the Gulf area (11). In addition, the Arabic language is one of the six official languages of the United Nations (12). It is the official language of the 22 countries that form the Arab League, and there are more than 300 million Arabic speakers across the world (13).

To our knowledge, no previous studies were performed to assess the quality of online information on type 2 diabetes in Arabic language websites. This study was to evaluate the available online information on type 2 diabetes in the Arabic language in terms of scientific quality, reliability, usability and the quality of decision support they provide. The article shows that most online Arabic medical content on type-2 diabetes lack basic quality criteria. In addition, it revealed that most Arabic medical articles are likely written by unqualified authors. Interestingly, most of the

evaluated websites did not provide references for medical information and they provided poor patient education and counseling.

METHODS

Study design

The current cross-sectional study provides a systemic analysis of the Arabic websites within the Palestine domain that provides information on type 2 diabetes. The study was performed during the period from August to October 2017.

Procedures for data collections

The study was designed to mimic what an average person would find when searching the internet for diabetes. It dealt with websites in the Arabic language. The search for the websites was performed using the most popular search engines according to (searchenginewatch.com), which use (alexa.com) as its source. The most popular search engine in 2016 were Google, followed by Bing and Yahoo that ranked 2nd and 3rd respectively. The search on Google was performed by using the Palestine domain (<https://www.google.ps/>), while the Arabic interface for Yahoo (<https://maktoob.yahoo.com/?p=us>) and Bing (<https://www.bing.com/?setmkt=en-XA&setlang=ar-XA&sid=09C3730544E563C400B4787645DD6208>) was used.

The search keywords that we used were the common Arabic name for the term "type-2 diabetes" 'السكري من النوع الثاني'. We intended to resemble the regular behavior of any patient seeking health information about diabetes. Accordingly, each search engine was used just once. All searches were evaluated by one person, and the evaluation was validated by two healthcare experts. In order to imitate the user attitude, we considered the first 25 hits from each search engine. Exclusion criteria included hits that had no information about type-2 diabetes, required login or requiring user fees, duplicates of websites we had already included, YouTube videos, links, books, articles or online forums.

Measures

The current study followed the methodology and evaluation criteria used in a published study by Weymann and colleagues (10). In their article, the authors evaluated the websites that provided information on type 2 diabetes in English and German languages. They used three major categories in evaluating the searched websites: formal quality, usability and accuracy of information provided by the website. They implemented DISCERN instrument (www.discern.org.uk, 2012), the International Patient Decision Aid Standards (IPDAS, 2005) and the German Action forum for health information systems (Aktionsforum Gesundheitsinformationssystem (Afgis), 2012) to help extracting a list of core criteria that were formulated into a

tabulated coding sheet. In our study we adopted the same coding sheet, but with some modifications that included the introduction and exclusion of some quality standards (QS) as shown in table-1. The modifications include the introduction of five QS to the subdomain “formal criteria” that are numbered 3, 4, 6, 21 and 22. This is beside the addition of one QS (numbered 13) to the subdomain “usability”. At the same time, three QS were excluded from the subdomain “formal criteria”, that are “declaration of conflicts of interest”, “if there is advertising, it is disclosed” and “development of the website is described”. Also one QS from the subdomain “quality of decision support” (If decision aids are provided: Which ones?) was also excluded.

Table (1): Quality criteria used in the study*.

Formal quality		Usability		Quality of decision support	
1	The author is identified	1	The document has a distinguishable header, body and footer	1	The website describes the health condition
2	Author's Affiliation is identified	2	Are there headings or subheadings	2	Describe the procedures relevant for decision-making
3	Author's expertise	3	The major headings and subheadings easily identifiable	3	Describe the treatment options
4	What is his/her qualification	4	Are there diagrams	4	Include the option of doing nothing
5	Credentials identified	5	Hyperlinks to external sites	5	Describe how each treatment works
6	Information reflects the author's opinion	6	Advertising	6	Describe the benefits of each treatment
7	Co-operators identified	7	Are the advertisements placed within the body of the text	7	Describe the risks of each treatment
8	Ownership of the site disclosed	8	The search engine within the site	8	Include the chances of the risks and benefits of treatment
9	Sponsor disclosed	9	Provide audio or video support	9	Provide probabilities of outcomes in an unbiased and understandable way use event rates specifying the population and time period compare outcome probabilities using the same
10	Sources mentioned	10	Supporting bodies like forums and discussion rooms		
11	References/links provided	11	Opportunity to send queries to the webmaster or authors		

Formal quality		Usability		Quality of decision support			
12	Copyright information noted	12	Satisfaction and knowledge evaluation questionnaires for users		denominator, time period, scale use diagrams use multiple methods to view probabilities like words, numbers, and diagrams allow the patient to select a way of viewing probabilities allow the patient to view probabilities based on their own situation place probabilities in the context of other events Use both positive and negative frames (both death and survival rates)		
13	Date of the creation and latest modification of the site been specified	13	Site content appropriate to all Audience				
14	The Site has been modified in the past month and year						
15	Date of the next update of the site has been specified						
16	A statement declaring that "information provided on the site is meant to complement and not replace any advice or information from a health professional" is clearly provided						
17	Patients involved in website development						
18	Quality of scientific evidence explained					10	Describe what would happen if no treatment is used
19	Information on self-help and support provided					11	Provide support for shared decision-making
20	Aims of the website clear						
21	Type of the website						
22	Information about the organization behind the website						

* Adopted with modifications from Weymann and colleagues, 2015 (10).

The formulated coding sheet includes 46 quality standards (QS). They were categorized into three subdomains; formal quality (22 QS), usability (13 QS) and quality of decision support (11 QS). Of these, forty-four QS were numeric and were coded as (1) if the answer was present, (0) when absent and (2) when the answer was partially present (not fully explained or the mentioned information was not enough). QS 4 and 21 of the formal quality subdomain were string variables.

Data analysis

For descriptive analysis, the total score for all of the 44 numeric QS was collectively calculated for each website. All standards were weighed equally as in previous studies (10, 14, 15). When a QS is met, it was given a score of 1, when partial-

ly met it was given a score of 0.5 and when not it was given a score of 0. The QS 'Does it provide probabilities of outcomes in an unbiased and understandable way?' was represented by eight items. The value of this QS was calculated as a mean of these eight items (e.g. if a website provides information about 4 out of 8 items, then the score for this QS would be 0.5). The total score for each coding sheet was 44, so that if a website could meet all of the QS, it would take a total score of 44. The total score for all of the websites was determined and the percentage of the met QS was calculated for each website as the following $\left(\frac{\text{score}}{44}\right) \times 100\%$. For example, if the total score for a website was 15, the percentage of the met QS would be calculated as $\left(\frac{15}{44}\right) \times 100\% = 34\%$. The websites that

achieved most often the highest or lowest percentages of total scores were determined. This was also calculated for the percentage of achievement (highest and lowest) of each of the three subdomains individually.

Regarding QS 21, the websites were classified into five categories: commercial, non-for-profit (NFP) organization, governmental, health association and individuals. The website's affiliation was identified based on information about the ownership provided by the website itself. All of the evaluated websites disclosed this information. The mean QS score within each type of these websites was also calculated.

RESULTS

Overall, seventy-five search results were obtained using the search keywords. By applying the inclusion and exclusion criteria detailed before, as well as excluding the duplicates, a total of 50 websites that are listed in the appendix were retained and analyzed.

Forty-six QS were rated; two of them were string variables (4-what is the author's qualification. 21-what is the website type.) and were not included in the calculations. The top ten websites with the highest percentage of total QS achievement were listed in descending order in table 2, while websites with the lowest percentage of total QS achievement were listed in ascending order in table 3.

The average percentage of QS achievement was 31.6% (min=7 (15.9%) and max=28 (63.6%)). Wikipedia.com website achieved the highest score, whereas and the lowest result was achieved by 4 websites (Diabetes treatment guide, Archive.aawsat, Universe magic, and Barcelona-surgery).

The quality subdomain "usability" was the most met subdomain with a mean of about 43% (calculated by dividing the sum of the percentage achievement of the usability QS by the number of usability QS). Among the QS of the three subdomains, the highest QS that was met most often was

"is there search engine within site" (94%) and "is there opportunity to send queries to the webmaster or authors" (92%). Both of these two QS belong to the "usability" subdomain. The quality subdomain where the least standards were met was "quality of decision support" with a mean of 25.4% (calculated by dividing the sum of the percentage achievement QS by the total number of QS for quality of decision support).

Table (2): The top 10 websites that achieved the highest percentage of QS.

	Name of the website	type of website	% of achieved QS
1	Wikipedia	NFP Organization	63.6
2	Real-sciences	Individuals	59.1
3	Feedo	Individuals	54.5
4	Wikihow	Individuals	47.7
5	Vezeeta-health	Health association	47.7
6	Lahaonline	Individuals	45.5
7	Altibbi	Individuals	45.5
8	Alghad	Individuals	40.9
9	Daily medical info	Individuals	40.9
10	Maglthk	NFP Organization	40.9

Table (3): The 5 websites that achieved the least percentage of QS.

	Name of the website	type of website	% of achieved QS
1	Diabetes treatment guide	Individuals	15.9
2	Archive.aawsat	NFP organization	15.9
3	Universe magic	Individuals	15.9
4	Barcelona-surgery	Health association	15.9
5	Atheer	NFP organization	18.2
	Alyaum	Individuals	18.2
	Shabiba	NFP organization	18.2

Formal quality

As demonstrated in table 4, the most achieved QS in this subdomain were "was

relevant copyright information noted?" (74%) and "has the date of creation and latest modification of the site been specified?" (68%). None of the websites achieved the QS "was the date of the next update of the site been specified?" and only 6% of the websites achieved the QS "were the co-operators identified?". The author was identified in 40% of the websites; however the percentage of showing his/her affiliation, expertise and credentials was 18, 10 and 10% respectively. Interestingly, Only 12% of the websites provided information written by qualified persons (2% by scientists and 10% by doctors). In addition, 34 % of the websites mentioned the source of information and only 10% of them included references or links to the provided scientific information.

Table (4): The frequency and percentage of websites that met the formal quality subdomain.

	Formal quality	Frequency (%)
1	the author identified	20 (40)
2	Author's Affiliations identified	9 (18)
3	author's expertise disclosed	5 (10)
4	What is his/her qualification	Scientist: 1 (2) Doctor: 5 (10) Unknown: 44 (88)
5	Credentials identified	5 (10)
6	information reflects the author's opinion	18 (36)
7	co-operators identified	4 (8)
8	ownership of the site disclosed	25 (50)
9	sponsor disclosed	7 (14)
10	sources mentioned	17 (34)
11	references/links provided	5 (10)
12	copyright information noted	37 (74)
13	date of the creation and latest modification of the site been specified	35 (70)
14	the Site has been modified in the past	12 (24)

	Formal quality	Frequency (%)
	month and year	
15	date of the next update of the site has been specified	0 (0)
16	a statement declaring that information provided on the site is meant to complement and not replace any advice or information from a health professional is clearly provided	13 (26)
17	Patients involved in website development	4 (8)
18	quality of scientific evidence explained	9 (18)
19	information on self-help and support provided	13 (26)
20	aims of the website clear	30 (60)
21	type of the website	Commercial: 1 (2) NFP organization: 22 (44) Governmental: 1 (2) Health organization: 5 (10) Individuals 21 (42)
22	Information about the organization behind the website	22 (44)

In the quality subdomain (usability), the QS that were achieved most often were "is there search engine within site?" (94%) and "is there an opportunity to send queries to the webmaster or authors?" (92%). The QS that were achieved least often were "are there satisfaction or knowledge evaluation questionnaires for users?" (6%) and "are there diagrams?" (8%). Eighty-two percent of the websites have a distinguishable header, body and footer, and 46% of them had a hierarchy of headings and sub-headings. Few websites provided diagrams (8%), audio or video support (16%). The content of around 64% of the websites ap-

peared to be appropriate to all audiences. Forty- four percent of the websites showed advertisements, and in 12% of the websites the advertisement was placed within the body of the text (table 5).

Table (5): The frequency and percentage of websites that met the usability subdomain.

	Usability	Frequency (%)
1	the document has a distinguishable header, body and footer	41 (82)
2	Are there headings or sub-headings	23 (46)
3	the major headings and subheadings easily identifiable	20 (40)
4	Are there diagrams	4 (8)
5	hyperlinks to external sites	18 (36)
6	Advertising	22 (44)
7	advertising, it is placed within the body of the text	6 (12)
8	the search engine within the site	47 (94)
9	provide audio or video support	8 (16)
10	supporting bodies like forums and discussion rooms	6 (12)
11	opportunity to send queries to the webmaster or authors	46 (92)
12	satisfaction and knowledge evaluation questionnaires for users	3 (6)
13	site content appropriate to all audience	32 (64)

Quality of decision support

In this domain, the top achieved QS were 'does the website describe the health condition?' (50%) and 'does it describe the treatment option?' (22%), and the QS that were achieved least often were 'does it provide probabilities of outcome in an unbiased and understandable way?' (11.5%) and 'does it include the chance of the risk and benefits of the treatment?' (14%).

Table (6): The frequency and percentage of websites that met the quality of decision support subdomain.

	Quality of decision support	Frequency (%)
1	the website describes the health condition	25 (50)
2	describe the procedures relevant for decision-making	11 (22)
3	describe the treatment options	11 (22)
4	include the option of doing nothing	11 (22)
5	describe how each treatment works	9 (18)
6	describe the benefits of each treatment	11 (22)
7	describe the risks of each treatment	8 (16)
8	include the chances of the risks and benefits of treatment	7 (14)
9	provide probabilities of outcomes in an unbiased and understandable way	-- (11.5)*
	a- use event rates specifying the population and time period	10 (20)
	b- compare outcome probabilities using the same denominator, time period, scale	6 (12)
	c- use diagrams	3 (6)
	d- use multiple methods to view probabilities like words, numbers, and diagrams	8 (16)
	e- allow the patient to select a way of viewing probabilities	3 (6)
	f- allow the patient to view probabilities based on their own situation	3 (6)
	g- place probabilities in the context of other events	6 (12)
	h- use both positive and negative frames (both death and survival rates)	6 (12)
10	describe what would happen if no treatment is used	12 (24)

	Quality of decision support	Frequency (%)
11	provide support for shared decision-making	8 (16)

* Calculated as the average of the substandards a to h

Correlation of website quality subdomains and website type:

According to QS 21, 46% of the analyzed websites were NFP, 42% were individual websites and 10% were health associations. There was only one commercial website. NFP organization websites achieved a significantly higher percentage of the formal quality subdomain standards as compared to

health association's websites (figure-1A). However, they poorly fulfilled the QS of the "quality of decision support" subdomain (figure-1D). Individual websites could best fulfill the QS of usability subdomain, which they could achieve even better than NFP organization websites (figure-1B and D).

The NFP had better formal quality than the individual websites (31% vs. 27%), whereas individual websites had better usability than NFP websites (50% vs. 34%) (Figure-1 D). The fulfillment of quality of decision support subdomain was quite variable among all website categories, therefore the data were not consistent (figure-1C).

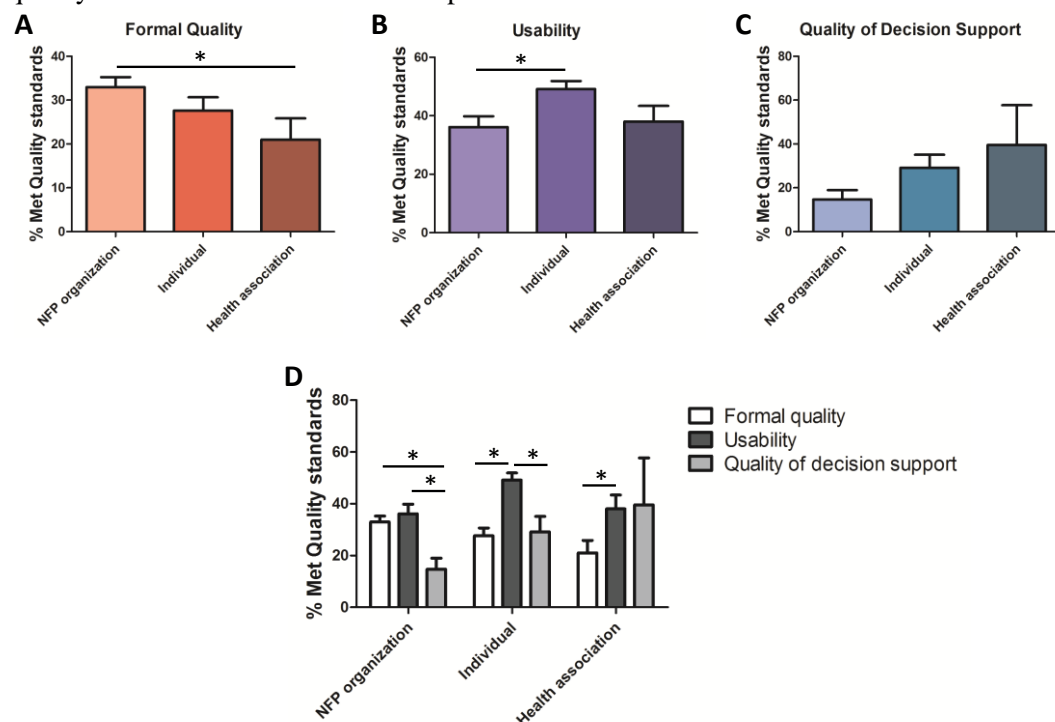


Figure (1): Correlation of website categories with the achieved quality subdomains (* $p < 0.05$).

DISCUSSION

Diabetic patients need to be involved in the decision-making process so that the best results can be achieved from the treatment while minimizing the accompanying risks. In addition, a well understanding of the disease helps the patient in coping with the various challenges and barriers, which the patient has to face and manage daily to keep adequate control of the disease (10). At the same time surfing the internet while looking for medical information might expose the patients to potential risks which include access to inaccur-

rate or misleading information and violation of individuals' privacy, but there are limited available data on the negative outcomes resulting from such activities (16). Therefore, extensive research activities that are focused on the quality of online health information is becoming more and more necessary in order to define and characterize the challenges, limitations and risks. Such information can, on one hand, help the website administrators or owners improve the quality of their own websites, and on the other hand, might help regulatory authorities set legislation and take

measures that can protect the average healthcare information seekers.

In this project, we focused on the quality of online information in the Arabic language provided by websites on type II diabetes. The data revealed that most of the websites did not meet the basic quality criteria, for example, more than half of the articles were written by anonymous authors, and only 12% of the articles were written by likely qualified authors (doctors and scientists). Moreover, the majority of the websites did not mention the source of the information or provide references or external links in order to verify the correctness of the information. Taken together it could be concluded that there is a high risk that most of the websites in the Arabic language could provide health information on diabetes mellitus that might be mixed with personal beliefs, myths and misunderstanding of scientific facts. In addition, the majority of these websites do not clearly tell the reader that the provided information should not replace any advice or information from a professional health care provider, something that can inspire the reader to take such information for granted, without having the chance for questioning this information. As a matter of concern, the majority of the websites do not disclose the sponsorship of the web page, which might render the reader as a victim for commercial campaigns.

The majority of the evaluated websites cared about the implementation of good usability criteria. Mainly, most of them provided texts that are written in a simple language that can be virtually understood by readers from different backgrounds, and the texts were formatted into distinguishable header, body and footer that makes it easier for the reader to navigate through the text and to find the required information. In addition, almost all of the websites provided a search engine within the webpage and offered the opportunity to send queries to the authors or webmasters. Such factors might increase the attractiveness and popularity of the websites, which can be reflected as an increase in website visits and therefore improve their market value.

Only half of the websites provided an adequate description of diabetes disease, and

around a quarter of them explained the consequences of leaving the disease without treatment, which can deprive the patient of a valuable opportunity to understand and appreciate the potential disease complications, which is necessary to motivate the patient to adhere to the treatment instructions and the recommended lifestyle modifications. In addition, less than a quarter of the websites discussed the treatment options or the benefits and risks of each treatment, which might negatively influence the quality of decision support. This shortage might be due to several reasons like the lack of qualifications and expertise of the authors, weakness of competency among websites, poor medical writing skills or inadequate financial investment, especially that the majority of the websites belong to individuals and NFP organizations.

Generally, there was a difference in quality subdomains among different website categories. Interestingly, the formal quality standards were better met by a website run by NFP as compared with those run by health associations, which in common sense should have been the opposite. However, individual websites scored best in usability, which might imply that these websites are more focused on design and ease of use rather than providing the patient with necessary and credible information.

A limitation of this study is that the investigation of some information on the websites is dependent on the investigator's own evaluation skills. In order to minimize the impact of this limitation on the outcome of the study, the collected data was verified by two investigators separately.

CONCLUSIONS

In conclusion, the data demonstrated a lack of credibility and low quality for the information on type-2 diabetes mellitus provided by the majority of websites in the Arabic language. Legislative authorities, health authorities and associations, and mass media should collaboratively intervene to enforce the implementation of quality standards on the online Arabic health information. On the other side, the owners of the websites should carry more sense for responsibility towards the public health and

the quality of the health information they provide online, and fore that they should accept the publication of information only when they are prepared by qualified authors and evidenced by credible references.(17)

CONFLICT OF INTERESTS

The authors declare that no conflicts of interest in this manuscript.

REFERENCES

- 1) Licciardone JC, Smith-Barbaro P, Coleridge ST. Use of the internet as a resource for consumer health information: results of the second osteopathic survey of health care in America (OSTEOSURV-II). *J Med Internet Res.* 2001; 3(4):E31.
- 2) Hesse BW, Moser RP, Rutten LJ. Surveys of physicians and electronic health information. *N Engl J Med.* 2010; 362(9): 859-60.
- 3) Baker L, Wagner TH, Singer S, Bundorf MK. Use of the Internet and e-mail for health care information: results from a national survey. *JAMA.* 2003; 289(18): 2400-6.
- 4) Akerkar SM, Kanitkar M, Bichile LS. Use of the Internet as a resource of health information by patients: a clinic-based study in the Indian population. *J Postgrad Med.* 2005; 51(2): 116-8.
- 5) Kelly L, Jenkinson C, Ziebland S. Measuring the effects of online health information for patients: item generation for an e-health impact questionnaire. *Patient Educ Couns.* 2013; 93(3): 433-8.
- 6) Murray E, Lo B, Pollack L, Donelan K, Catania J, Lee K, et al. The impact of health information on the Internet on health care and the physician-patient relationship: national U.S. survey among 1,050 U.S. physicians. *J Med Internet Res.* 2003; 5(3):e17.
- 7) Laugesen J, Hassanein K, Yuan Y. The Impact of Internet Health Information on Patient Compliance: A Research Model and an Empirical Study. *J Med Internet Res.* 2015; 17(6): e143.
- 8) WHO. Diabetes 2018 [updated 30 October 2018. Available from: <https://www.who.int/news-room/fact-sheets/detail/diabetes>.
- 9) Forouhi NG, Wareham NJ. Epidemiology of diabetes. *Medicine (Abingdon).* 2014;42(12):698-702.
- 10) Weymann N, Harter M, Dirmaier J. Quality of online information on type 2 diabetes: a cross-sectional study. *Health Promot Int.* 2015;30(4):821-31.
- 11) Meo SA, Usmani AM, Qalbani E. Prevalence of type 2 diabetes in the Arab world: impact of GDP and energy consumption. *Eur Rev Med Pharmacol Sci.* 2017;21(6):1303-12.
- 12) United-Nations. Official Languages 2019 [Available from: <http://www.un.org/en/sections/about-un/official-languages/>].
- 13) British-Counsel. A few surprising facts about the Arabic language 2015 [Available from: <https://www.britishcouncil.org/voices-magazine/surprising-facts-about-arabic-language>].
- 14) Griffiths KM, Christensen H. Quality of web based information on treatment of depression: cross sectional survey. *BMJ.* 2000;321(7275):1511-5.
- 15) Kisely S, Ong G, Takyar A. A survey of the quality of web based information on the treatment of schizophrenia and Attention Deficit Hyperactivity Disorder. *Aust N Z J Psychiatry.* 2003; 37(1): 85-91.
- 16) Hilliard ME, Sparling KM, Hitchcock J, Oser TK, Hood KK. The emerging diabetes online community. *Current diabetes reviews.* 2015; 11(4): 261-72.
- 17) Hasassneh, M. (2018). Quality of Online Information on Type-2 Diabetes Mellitus in Arabic Language Websites. (Master dissertation). An-Najah National University, Nablus, Palestine.