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Original Article

The Role of Virtual Education Networks on Students' Mental Health

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Abstract

Background: The Covid-19 pandemic changed the world; its most important achievement for education was changing the approach from traditional to virtual education. The present study aimed to investigate the role of virtual education networks on mental health of students including personality, beliefs, scientific, and cultural dimensions, in selected countries.
Methods: This was an exploratory and applied study. According to the phenomenology strategy, theoretical saturation occurred after 24 semi-structured and targeted qualitative interviews with teachers from Iran, Iraq, Syria and Lebanon, in 2023**.** Quantitative data was collected through a researcher-made online questionnaire with 423 participants. Teachers with at least a Bachelor's degree and five years of teaching experience were selected as the study participants. PLS software version 3 was used to analyze the quantitative data.
Results: After analyzing the qualitative interviews, 131 open codes were extracted, and grouped into 22 components and 4 concepts. The results of the quantitative data analysis (factor load) showed the effect of virtual education networks on personality (0.590), beliefs (0.819), scientific (0.564), and cultural (0.815) dimensions which indicate a statistically significant effect. Accordingly, students' belief is mostly affected by virtual education networks. The subcomponents of duality and moral-social confusion in the belief dimension, changing life and nutrition patterns in the cultural dimension, increasing communication and interpersonal problems in the personality dimension, and boredom and frustration in the scientific dimension were highly effective.
Conclusions: The study results showed that virtual education acts like a double-edged sword, with both negative and positive effects on the body and mind of students, which necessitates more careful monitoring.

***Keywords*:** Education, Students, Mental health, Coronavirus

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1. Introduction

The COVID-19 pandemic had a great impact on all areas of life, including education. Educational institutions were closed during the pandemic (1). Its outbreak in 2019 prevented traditional and face-to-face (one-on-one) education; as a result, virtual education was proposed as the first solution to prevent the interruption of education (2). On the one hand, almost all educational institutions in the world have turned to virtual education. This huge and unexpected transition from the traditional to the virtual education approach introduced a new methods of preparing educational contents (3). On the other hand, the methods and means of education are changing as technology expands continuously (4). New and evolving technologies create many opportunities for education and learning (5). The emergence of new devices (mobile phones and personal computers) indicate that information can be accessed without place and time limitations. Virtual education has a significant ability for teaching and learning in formal and informal education environments. Virtual education is one of the most prominent types of formal education that spread widely in the world during the Coronavirus pandemic (6). Most of the schools started virtual education for the first time during the pandemic without previous experience about such a method of education. Although students in developed countries were, to some extent, familiar with virtual education and had sufficient experience, this level of familiarity and experience was lacking in developing and impoverished countries (7-9). Virtual education is a set of educational activities that are carried out using electronics (audio, video devices, computer, and network) (6). In other words, virtual education is referred to as a powerful medium in education and learning while it is an integration of technology

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and education (10). Access to information and communication technology and eliminating the digital gap is essential for the success of virtual education. In the realm of education, it is crucial to draw attention towards the aspect of students' acceptance or preference (11), their experience and satisfaction (12) from the educational environment. Satisfaction causes the students to be kept, and makes them loyal to education (13). Student satisfaction is a valuable asset for educational institutions since the students talk about their positive or negative experiences and return as graduates (14).

The determinants of satisfaction with virtual education include the quality of: technical system, information, service, support system, learner, and teacher (7, 10, 12, 15, 16). According to previous studies, almost 80% of the participants prefer face-to-face education to virtual education (11, 17).

The sudden transition from traditional to virtual education caused negative reactions among students (18). The most common challenges at the onset of virtual education were lack of student participation, insufficient interaction of students with the teacher, lack of feedback or response at the wrong time (11), lack of interaction (19), lack of preparation for virtual education, insufficient learning resources, poor planning and the educational content's not being prepared (11), difficulty and unfamiliarity with how to use the virtual education system, computer anxiety (8). It seems that the cost of connecting to the Internet is expensive for a large percentage of people, especially in developing countries (20). Internet connection problems, including network congestion, high cost of Internet access, and inability to provide high-quality devices were the most important challenges (11, 21).

Given the mandatory quarantine, one of the concerns of researchers and educational officials is to investigate the impact and role of virtual education on students. Many studies have been conducted in recent years with regard to various variables and different methods. Also, several studies have evaluated the students' experience during virtual classrooms to better determine the factors that significantly affect the overall success of virtual education (7, 16, 17).

Social distancing has also led teachers to rely on a variety of media to interact with students; consequently, virtual education changed cultural norms and social behaviors among students (22). Opportunities and strengths were created on the one hand and threats and challenges were created on the other hand as virtual education formed (6). Among the positive results and effects of virtual education, the following can be mentioned: the impact of virtual education on cultural intelligence and cultural exchange among students with different cultural backgrounds, cultural expansion (cultural capital, cultural diffusion, cultural intelligence), expansion of family relationships, more communications and familiarity with diverse and different cultures, scientific exchange among students and their cooperation and participation in the learning process (6), gaining self-confidence, participation in the class, access to the Internet and their preference for virtual education (5, 21), acquiring academic self-efficacy, increasing computer literacy and ease of using technology in education, student satisfaction (7, 23, 24), personal adaptation of students to use technology, as well as increasing their motivation and self-efficacy in virtual education (25, 26) expansion of social presence (23), strengthening and maximizing independence in learning and active participation, transitional preparation of students to continue university education and job search, responsibility-taking, personalization of education, knowledge sharing at the national and local level, renewal of methods to receive information, redesigning the course by the learner (27), promoting media literacy, promoting the spirit of cooperation, self-directed learning, research-orientation (28), creating the homogeneity of cultures in the world (29), strengthening religious attitudes and beliefs, religious information, practices and religious experiences of students. However, the adoption of virtual educational methods has not made any significant impact on the adherence to responsibilities and overcoming religious taboos (30).

Among the results and negative effects of virtual education on students, the following can be mentioned: increased stress, anxiety, isolation and loneliness, lack of security among student (18), negative impact on mental health and mood behaviors of a number of students (31), negative impact on sleep quality, high anxiety and distress, depression and avoidance (Post-Traumatic Stress Disorder symptoms) (32) lack of social interactions, receiving too much information, ambiguous communications (8), elimination of hidden culture

and educations, diminished communications and participation with friends, reduction of group behaviors, promotion of self-disclosure (22), lack of real interaction and communication, lack of time commitment, lack of responsibility, increase in online campaigns, lack of motivation, increase in fraud, lack of class discipline (27), failure and weakening of national identity and national traditions (29).

Recently, the world has faced a devastating plague. The COVID-19 pandemic left many casualties worldwide in 2019. Students and teaching staff were forced to make changes in their teaching methods. However, an important question remains to be answered: What effects does virtual teaching have on students' mental health? Therefore, the present study aimed to investigate the role of virtual education networks on the mental health of students (in terms of personality, beliefs, science and culture) in selected countries (Iraq, Iran, Lebanon and Syria).

2. Methods

The present study aimed to examine the effects of virtual learning networks on various life aspects such as personality, beliefs, scientific and culture among high school students in a couple of selected countries (Iraq, Iran, Lebanon, and Syria). The exploratory mixed method was used in this applied study. The researcher employed both qualitative and quantitative research techniques. Initially, qualitative data were collected through semi-structured interviews, and analyzed using the Colaizzi method analysis. Subsequently, a researcher-designed questionnaire was used to collect quantitative data. The findings from both qualitative and quantitative data were integrated during the interpretation phase, in order to further analyze the data.

In the qualitative phase, the authors applied a phenomenological approach and purposeful sampling technique to conduct 24 semi-structured interviews. The participants were secondary school teachers from four countries: namely, Iran, Iraq, Lebanon, and Syria. The interviewees included a diverse group in terms of gender (9 women and 15 men) and nationality (10 Iranians, 7 Iraqis, 4 Syrians, and 3 Lebanese). Their teaching fields were (English Language, Physics, Biology, Literature, Geography and Religion). Four of the interviewees had a PhD degree, 3 were PhD students, 10 had a Master's degree, and 7 had a Bachelor's degree. The minimum work experience of the interviewees is 5 years and the maximum is 23 years. It is noteworthy that some interviews were conducted via WhatsApp with the assistance of a translator due to language differences (Persian and Arabic). Each interview lasted between 60 and 120 minutes and was recorded, transcribed, and carefully analyzed. Key themes were extracted from the interview texts, and coded. Given the relationships between codes and categories, the research team reached a final agreement on these categories. In order to validate the results of the qualitative data, various methods such as triangulation, paired sample tests, expert verification, and peer review (refereeing) were employed. Relative content validity was used in the qualitative phase to ensure validity, while the research reliability was determined (0.87) using Holsti's method.

The quantitative phase of the study falls within the applied research group based on the objectives of the study and a descriptive-survey method was used. The statistical population consisted of 423 secondary school teachers from four the countries who responded to a researcher-developed questionnaire online through random sampling method. Teachers with at least a Bachelor's degree and five years of teaching experience were selected as the study participants. The online questionnaire respondents were categorized by gender (164 men, 256 women, and 3 unspecified cases) and nationality (148 Iranians, 148 Iraqis, 52 Syrians, and 75 Lebanese). Eighty-three teachers who responded to the online questionnaire had a PhD degree, 66 had a Master's degree, 265 had a Bachelor's degree, and 3 were unspecified. The minimum and maximum work experience of the interviewees was 5 and 23 years, respectively. Based on the results obtained from the qualitative data and the identified themes, some adjustments were made to the questionnaire. A total of 74 items were included in the questionnaire, rated on a 5-point Likert scale (ranging from completely agree=5 to completely disagree=1).

Face validity was assessed by four university professors. To determine content validity, a separate questionnaire with 100 items was prepared, and each item was evaluated by 15 experienced teachers using a three-part spectrum: "necessary," "useful but not necessary," and "not necessary". Based on

Lawshe's table for an expert panel (15 people), the minimum acceptable CVR value was determined to be 0.49. Questions with a CVR value lower than 0.49 were excluded. As a result, 26 items were removed from the test questions, while the remaining 74 items were picked for the following phases of the research. The Cronbach's alpha coefficient was employed to measure the reliability of the questionnaire. The reliability coefficients obtained for different dimensions were as follows: scientific (0.86), personality (0.87), cultural (0.93), beliefs (0.97), and overall questionnaire reliability (0.96). PLS software was utilized for data analysis.

3. Results

In this mixed-methods study, the effects of virtual learning networks on certain dimensions of personality, beliefs, scientific, and culture among high school students in a selected number of countries (Iraq, Iran, Lebanon, and Syria) were examined.

3.1. Qualitative Results

After analyzing 24 interviews in the qualitative phase, 131 sub-categories were identified, which were categorized into 22 main categories and 4 dimensions. The dimensions, namely, scientific (6 main components and 41 sub-categories), personality (5 main components and 33 sub-categories), culture (6 main components and 33 sub-categories), and beliefs (5 main components and 24 sub-categories) were extracted. Figure 1 refers to the main components.

3.2. Quantitative Results

After analyzing the results obtained from the qualitative data, the researcher prepared a questionnaire with 74 items, answered online by 423 teachers. Figure 2 reports the value of the t-statistic related to the effect of virtual learning networks on the students' personalities, beliefs, scientific, and culture.

According to the Figure 2, the value of the t-statistic related to the effect of virtual learning networks on personality, beliefs, scientific, and culture was reported as 6.643, 29.310, 7.664, and 24.118, respectively, highlighting the existence of a correlation.

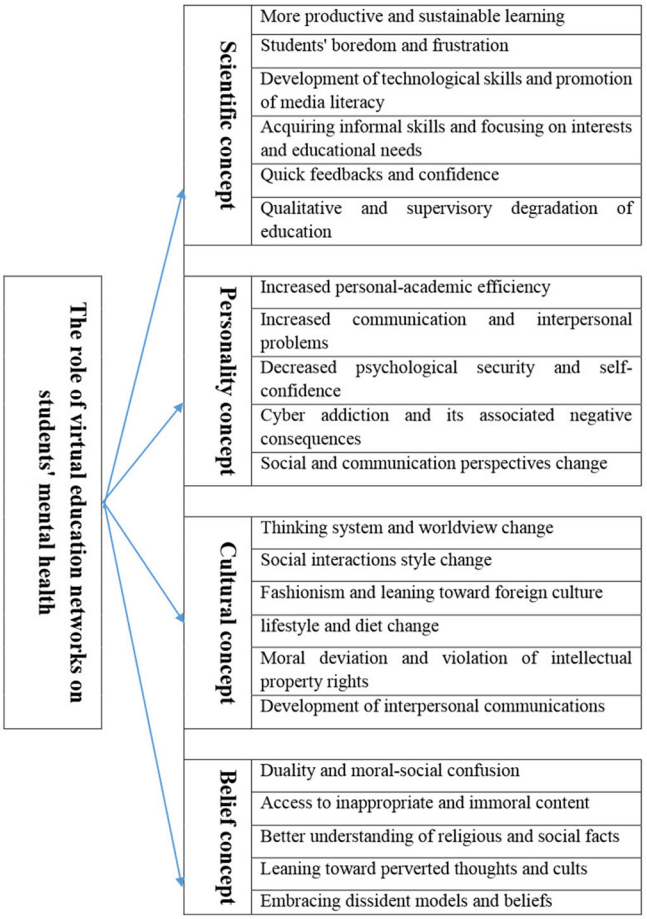

Figure 1: The figure shows the role of virtual education networks on students' mental health.

Figure 3 presents the factor loading coefficients model of the effect of virtual learning networks on students' personalities, beliefs, scientific, and culture.

As can be seen in Figure 3, the effect of virtual learning networks on students' personalities, beliefs, scientific, and culture has been reported as 0.590, 0.819, 0.564, and 0.815, respectively. These indicated a direct and moderate effect and are statistically significant. In fact, given that other variables are constant, a one-unit increase in virtual learning networks can raise the value of dimensions of personality, beliefs, scientific, and culture by 0.590, 0.819, 0.564, and 0.815, respectively.

Also, the coefficient of determination for the dimensions of personality, beliefs, scientific, and culture were 0.348, 0.671, 0.319, and 0.664, respectively. This suggested that the variable of virtual learning networks can account for 0.348, 0.671, 0.319 and 0.664 percent of changes in personality, beliefs, scientific, and culture.

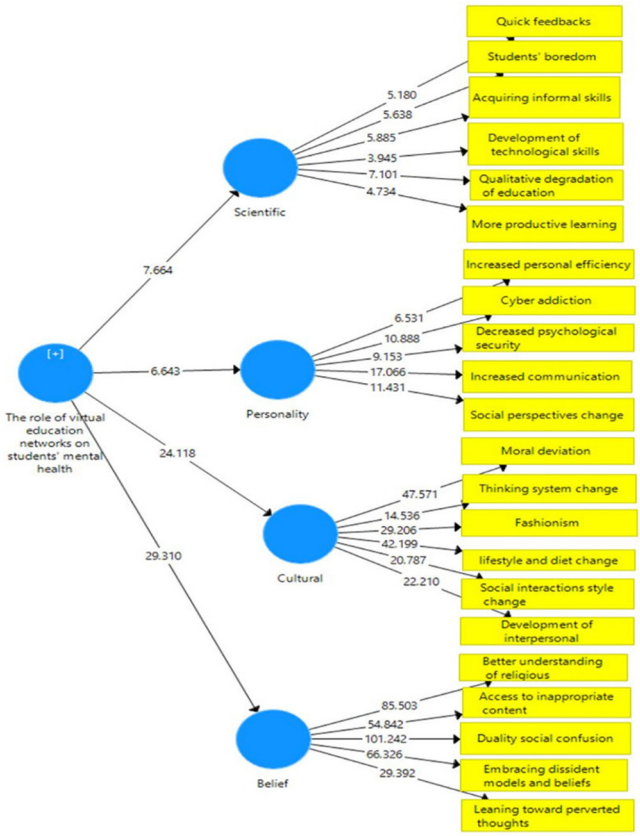

Figure 2: The figure shows the significance model of the impacts of virtual learning networks on students' personalities, beliefs, scientific, and culture.

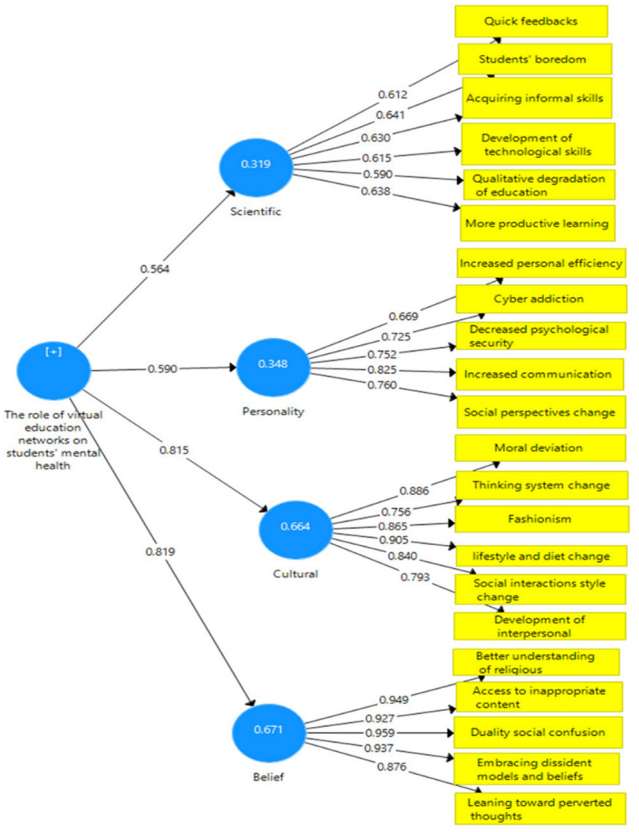

Figure 3: The figure shows the factor loading coefficients model of the impacts of virtual learning networks on students' personalities, beliefs, scientific, and culture with P<0.001.

The results reported in Figure 3 suggested that beliefs are mostly affected by virtual learning networks. Also, the sub-category of duality and moral-social confusion in the belief component, the sub-category of lifestyle and diet change in the cultural dimension, the sub-category of increased communication and interpersonal problems in the personality component, and the sub-category of boredom and frustration in the scientific component are the most affected areas.

As can be seen in Table 1, the values obtained from the model fit are acceptable and therefore the model fit is confirmed.

4. Discussion

The results of the present exploratory study showed that virtual education has both positive and negative effects on personality, belief, cultural and scientific dimensions of students. According to the results, it should be acknowledged that virtual learning networks had the greatest impact on students' beliefs. The authorities should focus on both the overt and covert functions of education at the same time. Students were thrust into a new world following the outbreak of COVID-19 and the expansion of virtual learning networks, a world without boundaries, where time and space are irrelevant. This free and limitless space comes with

Table 1: Model fit indices

Statistical index	Acceptable values	The values obtained
Relative chi-square	<3	2.54
SRMR	<0.1	0.083
NFI	>0.9	0.93
d-ULS	<0.95	0.91
d-G	<0.95	0.87
Gof	Close to number 1	0.91

SRMR: Standardized Root Mean Squared; NFI: Normed Fit Index; d-ULS: Squared Euclidean Distance; d-G: Geodesic Distance; Gof: Goodness of Fit

opportunities and challenges, encouraging some evil countries to shift from armed conflicts to soft wars. A conflict in which the soul, mind, beliefs, culture, and, to put it in a nutshell, the teenagers' entire life are being targeted.

The belief concepts include: duality and moral-social confusion, access to inappropriate and immoral content, better understanding of religious and social facts, leaning toward perverted thoughts and cults, embracing dissident models and beliefs. The sub-category of duality and moral-social confusion, with a factor load of 0.959 in the beliefs category, had the greatest impact on secondary school students. Therefore, students should become aware of the covert, behind-the-scenes objectives of many websites that are making propagandas against the Islamic lifestyle and childbearing, promoting infidelity, normalizing pre- and extramarital relations, promotion of promiscuity and variety seeking, advocating the raising of marriage age, making propaganda against authentic national traditions, housewifery, and promoting women's employment outside the home while authenticating it with the western model, openly questioning and propagandizing against hijab, creating false doubts and questioning the principles of Islam, spreading rumors about religious leaders, promoting perverted or distorted cults and religions to mislead and corrupt the youth. Due to a variety of misleading contents accessible on the Internet, students are now terribly doubtful and hesitant and cannot distinguish right from wrong. The results of the present study were consistent with the results of some previous studies (33-35).

The cultural concepts include: thinking system and worldview change, social interactions style change, fashionism and leaning toward foreign culture, lifestyle and diet change, moral deviation and violation of intellectual property rights, development of interpersonal communications. The sub-category of lifestyle and diet change, with a factor load of 0.905 in the culture category, ranked second. Along with virtual education, there are always some advertisements and propaganda that are fed to the audience with the hidden and obvious purpose of changing their lifestyles and diets. Our results from both quantitative and qualitative data referred to the changes in students' lifestyles and diets. Media have fueled this problem by using targeted advertisements for processed foods, slimming or obesity drugs, promoting unrealistic models for teenagers. A high level of trust in media advertisements has caused a fundamental change in students' lifestyle and nutritional behavior; thus, students have turned to fast food and western foods, showing less desire for traditional and national foods. This has caused problems and conflicts between parents and students while affecting their health, which is consistent with the results of some previous studies (29, 34).

The personality concepts include: increased personal-academic efficiency, increased communication and interpersonal problems, decreased psychological security and self-confidence, cyber addiction and its associated negative consequences, social and communication perspectives change. The sub-category of increased communication and interpersonal problems, with a factor load of 0.825 in the personality category, ranked third. Along with the opportunities, there are always some problems and challenges, and virtual education is no exception. Despite the advantages of virtual learning, different challenges exist, such as increased communication and interpersonal problems among students. In the interviews, teachers raised issues like an increase in negative psychological variables such as neuroticism, anxiety, fear, feelings of inferiority and misery. The results were in line with two previous studies (18, 31).

The scientific concepts include more productive and sustainable learning, students' boredom and frustration, development of technological skills and promotion of media literacy, acquiring informal skills and focusing on interests and educational needs, quick feedbacks and confidence, qualitative and supervisory degradation of education. The sub-category of students' boredom and frustration, with a factor load of 0.641 in the scientific category, earned the fourth and last position. Any activity requires some planning and preparation of infrastructure before it can start. The unexpected and forced migration from traditional education to virtual learning did not allow for planning and preparing conditions, especially in developing countries; students faced many challenges and problems from the very beginning of the virtual education path, which were mentioned by teachers in their interviews. Problems like unfamiliarity with how to use virtual education systems, a huge amount of time wasted on the preparation of educational materials by the teacher for online

lectures, low-speed Internet, and a lack of access to smartphones and tablets left the students bored and frustrated. This was consistent with previous results (36) indicating the limitations teachers faced to communicate with their students, confusion resulting from the lack of preparedness in the infrastructure, and lack of training on how to use the system.

4.1. Limitations

The main limitations of the present study were as follows: questionnaires and online surveys increase the possibility of response bias. In online questionnaires, the researcher has no control over the respondents (the real identity of the respondent is not known). Also, "online survey fatigue" which can affect the accuracy of the response was another potential limitation of this study. Language and cultural difference were other limitations in this study.

5. Conclusions

Virtual learning serves as a double-edged sword in the education system. Given the two-year experience of virtual learning during the COVID-19 pandemic, some students prefer face-to-face classes to virtual education, and most of the students do not want virtual education in the future. However, most teachers believe that their colleagues tried to provide maximum help and useful feedback to students during the virtual education period. On the other hand, some students achieve high media literacy and come to the conclusion that teachers are not the only source of knowledge and information; they are just facilitators in teaching and learning. Hence, students can use various Internet sources as their main source of information, and play an effective role in creating a better future. A number of students have proven to be capable of taking the responsibility of their own teaching and learning, being active in evaluating curriculums, and personalizing the learning process.

Ethical Approval

This study was authorized by the ethics committee of Khorasgan Azad University with the code of IR.IAU.KHUISF.REC.1402.286. Also, written informed consent was obtained from the participants. Informed consent was not obtained by compulsion, and participants had the option to withdraw at any time during the research. Finally, the participants were ensured of the confidentiality of the information supplied.

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Authors' Contribution

Oday Khalid Lazim AL- Tameemi: Substantial contributions to the conception and design of the work; the acquisition, analysis, and interpretation of data for the work, drafting the work and reviewing it critically for important intellectual content. Mohammad Ali Nadi: Contribution to the design of the work, reviewing the manuscript critically for important intellectual content. Zahra Yazdani: Contribution to the conception of the work, drafting the work and reviewing it critically for important intellectual content. Raed Rasim Younus Aljbara: Contribution to the design of the work, reviewing the manuscript critically for important intellectual content. All authors approved of the final version to be published, and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflict of interest: None declared.

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