Towards a Unified Framework for Distributing Health Awareness Message Using Social Media Platforms

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***Abstract*— The use of social media as a platform to increase people health awareness has increased considerable in the last recent years. Although a growing research has demonstrated the tremendous value of using social media for promoting health awareness among the public, there is lack of framework that guide health organisations to design and deliver effective health awareness. The aim of this paper is to firstly assess the current process of publishing health awareness messages health organisations and subsequently provide a suitable framework for disseminating such messages via social media platforms. To this end, an initial literature review of the current best practices of social media was carried out and then a survey was developed and administered to selected health organisations seeking their current practices of publishing health awareness message. Based on the analysis of their information, a proposed framework of publishing health awareness message was developed. Initial results show the adaptability and importance of a unified social media context-aware framework in disseminating health awareness message to public. This paper concludes by identifying directions for future research.**

Keywords*— *Social Media; Health Promotion; Health Awareness; E-health, healthcare

I. INTRODUCTION

The rapid increase number of people with lifestyle health problems and infectious diseases created considerable pressure and challenges on national health systems across the globe. The reactive strategy of providing more health services to treat the increased number of public appears to be less effective [1]. This has driven policymakers to search for more effective proactive strategies to face this enormous challenge. One strategy, inspired by Benjamin Franklin axiom that "an ounce of prevention is worth a pound of cure'', is public health communication – conveying messages to public increase health awareness. The importance of this reactive strategy is illustrated in the emergence of health communication as a scholarly field on it is own that separated itself from communication studies, health education and promotion and related disciplines [2].

One aspect of public health communication which has received increasing attention is the channels (media) through which health message can be effectively delivered to, and reach, a wide range of relevant audience. In this respect, health organisations have traditionally focused on the printed media (e.g., poster, leaflet, etc.) and traditional media (e.g., SMS, phone calls, etc.) as the media through which that transfer their health messages.

With increasing people usability of, and access, to the Internet, health organisations have relatively recently turned to social media to promote health awareness among the public [3]. Social media (e.g., Facebook, Twitter and Snapchat, etc.) have enabled greater space for collaboration and facilitate the creation and exchange of information [4]. However, although the use of social media to convey health message has been hailed as a valuable tool due to several advantages (e.g. cost-effective) over the conventional media, the use of this new form of public health communication pose challenges [5]. The increased number in types of social media (e.g., Facebook, Twitter) and content of health message in these media create unmanageable source of information can create confusion for individuals and affect their capacity to obtain, process, and understand the basic health information and services needed to make appropriate health decisions [5]. However, there is limited studies in the current literature. Therefore, there is an urgent need for transformative the design (in term of content) and media) to reach to a guiding framework to help health organisation to effectively deliver health message and fully obtain the advantages of social media.

The aim of this paper is firstly to assess the current process of publishing health awareness message in health organisations and subsequently to provide a suitable unified framework for disseminating such messages via social media platforms. To this end, an initial literature review of the current best practices of social media was carried out and then a survey was developed and administered to selected health organisations seeking their current practices of publishing health awareness message the survey has been conducted for three months. Based on the analysis of their information, a proposed unified framework of publishing health awareness message was developed.

The remainder of this paper is structured as follows. In the next section, a brief review of the literature on health communication and social media is provided. Section 3 analyses the current process of publishing health awareness message in health organisations. Section 4 presents a proposed framework for publishing health awareness message. The paper concludes and provides future research to the public directions in Section 5.

II. LITERATURE REVIEW

The public health communication has emerged as a modern strategy to change public health behaviour by raising the awareness of risk diseases. Public health communication refers to 'the scientific development, strategic dissemination, and critical evaluation of relevant, accurate, accessible, and understandable health information communicated to and from intended audiences to advance the health of the public' [2]. Thus, the process of communicating health awareness message starts by ensuring an accurate content of the message to effectively delivering the message. This involves collecting information on health diseases from multiple sources and then transform them into an informative message. Having designed the content of the message, the next step is to select an effective media to deliver it. Health organisations have traditionally focused on the printed media and traditional media (e.g., SMS, phone calls, etc.) as the media through which that transfer their health messages. In addition, mass media has been used to expose a high percentage of population to health promotion message. This media involves a variety

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of form to convey health messages, including television, newspaper, radio, booklets, billboards, posters, and leaflets.

The transformation from Web 1.0 to the second generation of the World Wide Web (Web 2.0) facilitates information sharing, interoperability, user-centred design and collaboration [4]. The development of Web 2.0 has led to the web applications that generate social interaction and exchange of information between individuals. Social media includes collaborative projects, blogs, content communities, social networking sites, virtual game worlds and virtual social worlds are examples of these web applications [6]. Social media applied to almost every aspect of people interaction and has recently been used in public health communication [5]. The development of e-health promotion via social media platforms plays a significant role in the contribution to reinforcement the public health at the level of individual and society [7]. Since the Internet has expanded accessibility to a wide range of data, its advancement to Web 2.0 has given a contributory place where everyone can create, participate and, interact with others [8]. Nowadays, social networking sites including Twitter, Facebook, and Instagram, are popular online platforms which deployed as a new means for delivering health awareness knowledge to the public [5][9]. It enables individuals or groups of people to communicate, interact with each other, share information, collaborate and exchange content [10][11]. It can be categorised into various types, including social networking sites (e.g. Facebook and LinkedIn), blogs (e.g., WordPress and Blogger), microblogging (e.g., Twitter), media sharing sites (e.g., YouTube, Instagram and Flickr) and Wiki (e.g., Wikipedia) [11][12]. Twitter allows users to communicate and interact with followers in messages called a tweet with a maximum length of 280 characters. A tweet can be included with a photo or a video and link to the primary source (URL) [13][14]. According to global Statics [15], Twitter has an estimated 330 million active users per month. There are many features that reinforce the level of engagement in Twitter, such as retweets, likes, mentions and replies [16].

III. THE CURRENT PROCESS OF PUBLISHING HEALTH AWARENESS MESSAGE

The current process of publishing health awareness message has been captured at research visits in 10 participating healthcare organizations located in Kingdom of Saudi Arabia, namely; Ministry of Health in Riyadh, Ohud Hospital in Madinah, King Saud Medical City in Riyadh, King Fahad Medical City in Riyadh, King Faisal Specialist Hospital & Research Centre in Riyadh, King Fahad Armed Forces Hospital in Jeddah, King Abdulaziz Medical City in Jeddah, King Fahad Hospital in Madinah, King Fahad Specialist Hospital in Dammam, and Saad Specialist Hospital in Khobar. Selection of these organizations is primarily due to these organizations having a robust organizational culture clearly identified by their employees. Also, these 10 organizations possess a highly tested and highly reliable medical information database that were collected by health educators and physicians. Finally, these organizations utilize a diverse means of spreading health awareness messages; hence, an added motivation for choosing these 10 organizations. A mixed approach was adopted in order to acquire the results of the process of publishing such messages. Firstly, structured interviews were conducted by the researcher in 10 organizations with employees working in different departments, namely; Health Education Department, Media Administration, and the administration of identity and production. Secondly, a questionnaire was designed based on the literature review and distributed by email where different types of question/item was included. Finally, using IBM SPSS Statistics 25, data analysis was performed that captured the data influence and impact. Typical questions in the questionnaire include the following: 1. what are the most common diseases that public need to be continuously aware of? 2. What are social media platforms that are in use in your organization? 3. Who does formulate the models of scientific material of the health awareness message? 4. Who is in charge of designing the health awareness message after receiving the scientific material? 5. Who is in charge of publishing the health awareness message after being designed by the responsible party? 6. Which of the following do the health education specialists use to evaluate the health awareness message on targeted people in short term? 7. How important and effective are the following activities when assessing the impact of the health awareness message in long term? 8. How frequent and effective using the following media representation in the content of health awareness message? 9. How frequent and effective using the following component in the content of health awareness message?

The process varied in terms of the health problem targeted by the awareness message (e.g., diabetes), the media of publishing health awareness message (e.g., traditional channels, social media, etc.), the writer of the scientific material health awareness message, the designer of the health awareness message, the publisher of the health awareness message, the evaluation of the impact of the health awareness message on society in the short and long term, the media content of the health awareness message (e.g., text, video, etc.) and the content elements of the health awareness message (e.g., organization's badge).

The health awareness messages designed by the participated health organisations targeted various health problems (see Figure 1). The most frequent health problems covered is obesity (98%) followed by diabetes (94%) and then high blood pressure (88%). It is clear that the most frequently covered problems represent the most common and life-threating problems. The least frequent health problems depression (64%), liver disease (64%) and eye disease (62%). The remaining health problems with their frequencies are illustrated in Figure 1.

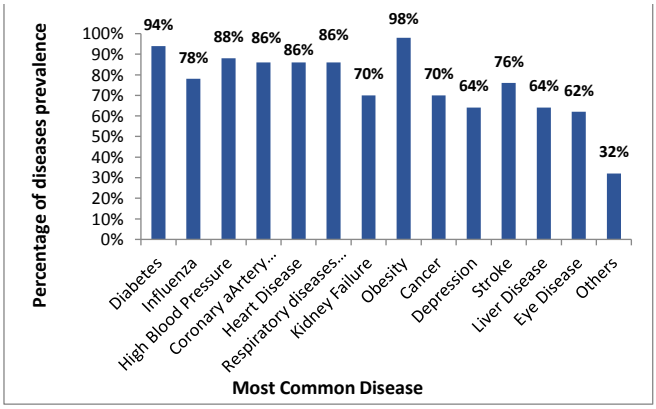

Figure 1. The most common diseases that people need to be aware

As for the media through which health organisations publish their health awareness message, organisations use three types of media namely, printed media (e.g., poster,

leaflet, etc.), traditional media (e.g., SMS, phone calls, etc.) and social media (e.g., Facebook, Twitter and Snapchat, etc.). Our analysis revealed that the printed media techniques still dominated as media to publish health awareness message. However, social media platforms are gaining momentum as are being, on average, used more than traditional media. The participated health organisations reported that a wide range of social media platforms are being employed to deliver health awareness message to reach a large number of people (refer to Figure 2). The most frequently used social media platform is Twitter followed by Snapchat and then WhatsApp. On the other hand, the most effective platforms are Twitter, WhatsApp and Snapchat respectively based on the answers of the respondents. Noticeably, although Facebook is more effective than YouTube, it is being used less than YouTube. The remaining social media platforms and their associated frequency of use and effectiveness are presented in the diagram.

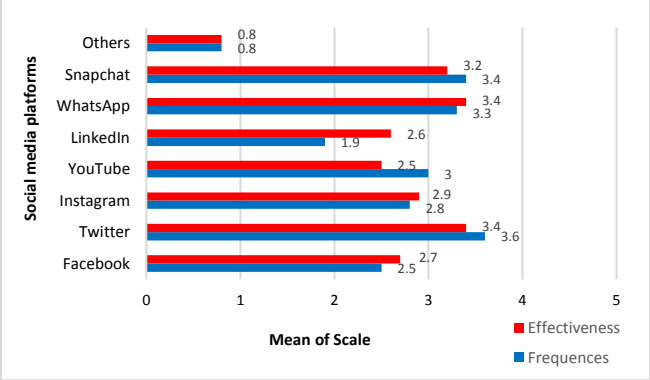

Figure 2. The frequency and effectiveness of social media techniques

The participated health organizations reported that the writer of the scientific material of the health awareness message can one from 10 different writers (see Figure 3). The most frequently used writer is certified health websites followed by health education specialist and then doctors/physicians (see blue bars). However, the most effective writer according to the sampled organizations is doctors/physicians, certified health websites and health education specialist, respectively. It can be observed that although is one of the most effective writers, the frequency of use is relatively low compared with certified health websites and health education specialist. The remaining writers with their frequency of use and effectiveness are shown in Figure 3.

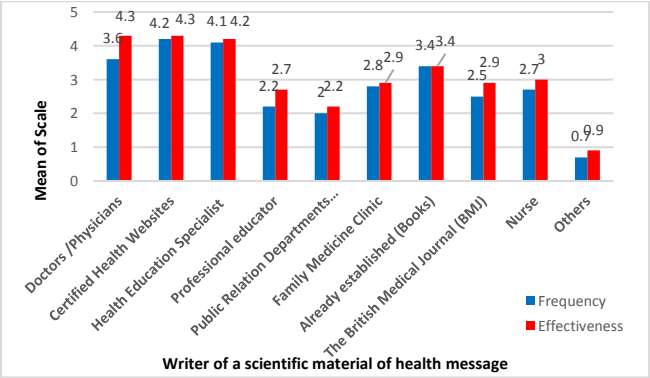

Figure 3. The writer of the scientific material of the health awareness message

The participated health organizations revealed that the design of the health awareness message is managed by different parties within and without these organisations (refer to Figure 4). The most frequent responsible party being adopted for designing the health awareness message is graphical designer followed by Health Education Department and then Advertising and Design Agency. Concerning their effectiveness, the more frequent used parties are the most effective parties as clearly depicted in Figure 4.

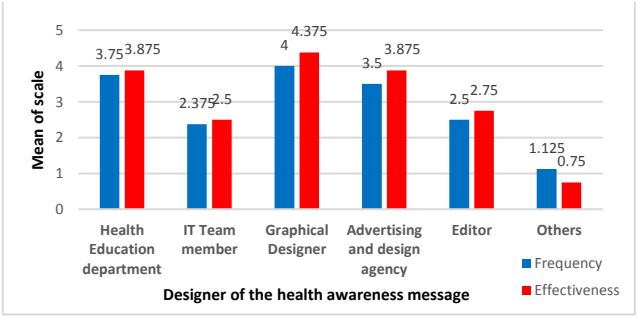

Figure 4. The designer of the health awareness message

The participated health organisations indicated that the publishing of the health awareness message can be accomplished by different parties (see Figure 5). The most frequent responsible party who in charge of publishing the health awareness message is Public Relation Departments followed by Health Education Department and then Doctors/Physicians and IT Team. As for the effectiveness of publishing through these parties, the results show the same pattern of distribution as the most frequently used. In other words, the most frequently used parties are the most effective parties.

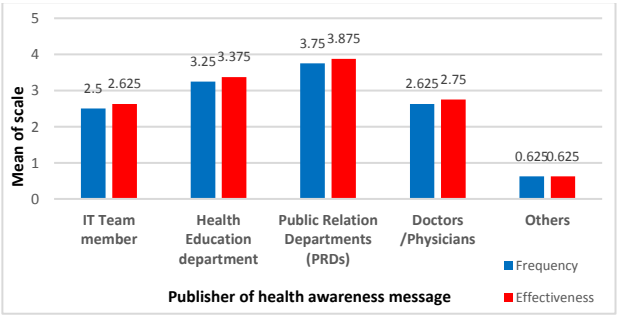

Figure 5. The publisher of the health awareness message

The participated health organisations use different evaluation methods of the impact of the health awareness message on society on both the short-term (see Figure 6) and long-term. The organisations give high importance to ‘direct questions’, ‘immediate evaluation of teaching session’, ‘teach-back method’ and ‘seek feedback from the patient’, respectively, as methods of evaluating the impact of the health awareness message on the short-term (see blue bars).

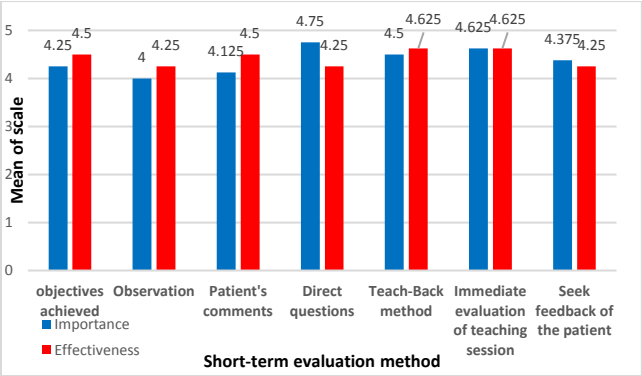

Figure 6. The evaluation methods of the impact of the health awareness message on society on the short-term

With respect to their effectiveness, it is clearly shown that 'teach-back method' and 'immediate evaluation of teaching session' followed by 'patient's comments' and then 'direct questions', 'observations' and 'seek feedback from the patient' (see red bars). In general, although 'objectives achieved' and 'patient's comments' evaluation methods are more effective compared to other methods, organizations attach less importance to them compared to less effective methods. As for the long-term evaluation of the impact of health awareness message, organizations use a variety of methods. Table 1 shows the importance of each method based on its influence on targeted people. The most emphasized means reported by the organizations was by checking the increased amount of number of people who are doing early detection of specific diseases. The remaining methods, such as using statistical methods, are relatively equally important for these organizations.

Table 1. Methods of evaluating the impact of the health awareness message

Number	Method	Importance
1	Use one of any statistical methods	3.5
2	The amount of drug consumed are reduced	2.62
3	Severity of disease's conditions is reduced	3.25
4	Diminishing incidence rates of the disease through addressing the risk factors causing the disease	3.62
5	Increase the number of people who are doing the early detection and of specific disease and its complications	4.12
6	Increase the number of people who are doing the comprehensive detection	3.62
7	Others	1.25

In term of the media content of the health awareness message, the participated health organisations use a variety of media contents (refer to Figure 7). Including a photo in the health awareness message was the most commonly used content by the organisations followed by text, cartoon and video, based on the mean of frequency (see blue bar). This was expected given that these media, in particular, fully capture individuals' attention. This is clearly evidenced when we asked about how effective these media contents. The respondents indicated that insert text, cartoon, and cartoon drawing are the most effective media content with the remaining are relatively equally effective (see red bar). Surprisingly, although adding a photo to the health message was the most frequently used, it was the least effective media content. The remaining media contents with their associated frequency of use and effectiveness are detailed in Figure 7.

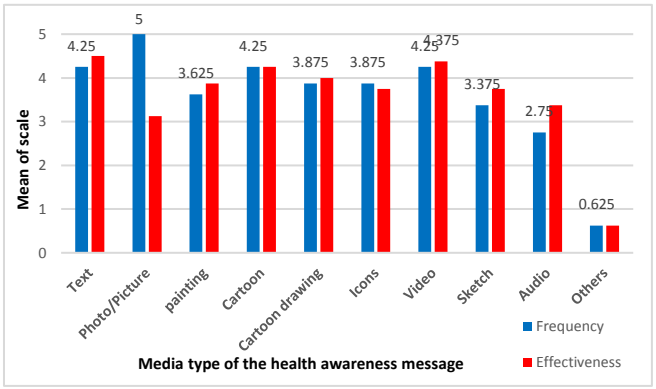

Figure 7. The media content of the health awareness message

Finally, the involved health organisations in this study reported that they use different content elements of the health awareness message (refer to Figure 8). Based on the mean of the respondents' answers, the most frequently used element is including the organization's badge and appropriate exercise.

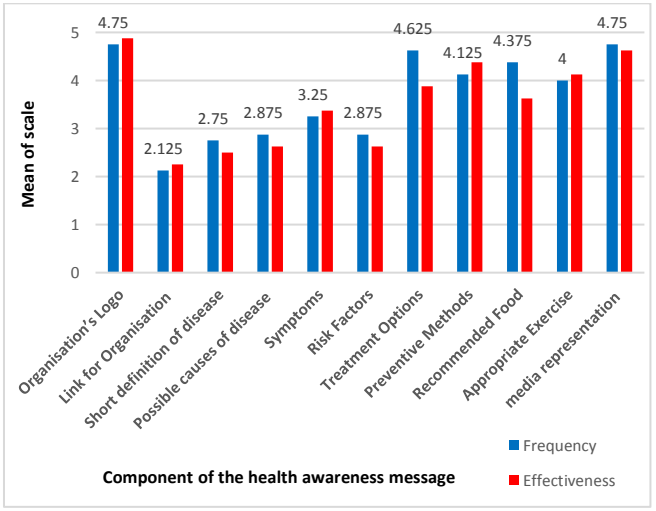

Figure 8. The content elements of the health awareness message

As for effectiveness, inserting an organization's badge and recommended food are the most effective elements according to the sampled organisations, while inserting link for the organisation's website is the least effective element. The remaining elements and their associated frequency of use and effectiveness.

IV. A PROPOSAL OF USING SOCIAL MEDIA TO SPREAD THE HEALTH MESSAGE

In the previous section, a detailed analysis of the current process of publishing health awareness message in 10 organizations was provided. This analysis is shown as an entity of the process that lead to develop a framework of distributing the health awareness message (see Figure 9). The analysis highlighted the need for solid and unified framework that guides health organizations in publishing health message using social media platforms. The analysis revealed that organizations often used multiple social platforms and parties

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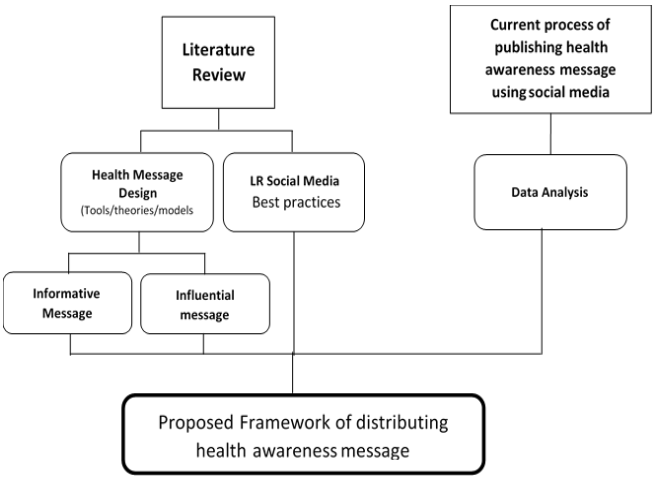

Figure 9. The process of developing the framework

to publish health organizations. Although this might provide more cover of a wide range of audience, it might generate information overload and thus affect the patients' abilities to seek information from the message. Although social media have considerable potential as effective platforms for health promotion and awareness, these media require careful application as may not always achieve their intended outcomes [17][18][19]. Therefore, publishing health awareness message should be a systematic and organized process [20][21].

In this study, an initial framework has been suggested in order to distribute the health awareness knowledge to public in an effective manner (refer to Figure 10). The framework suggests that publishing health awareness message should be organized and follow through seven stages with sub stages. In the first stage, the health disease or problem that needs health awareness message designed for should be determine. The determination process is based on health organizations awareness priorities set up and highlighted in their health communication strategy and plan. Once the health disease or issue is specified, the second stage is to collect authentic, accurate and relevant material on it. In this stage, information and material can be gathered from multiple sources such as certified health websites, health education specialist or doctors/physicians. In the third stage, the design stage, consists of two sub-stages: content design and technical design. In the content design, the relevant information on the health disease should be only selected and included in the message. This can also be accomplished by health education specialist or doctors/physicians. In the technical design, media content should be selected and included. Content media can be text, photo, video, audio, cartoon, and cartoon drawing. This should be based on the social media being used. However, the most effective media content are text, cartoon and cartoon drawings. In this stage, graphical designer or specialist can be used. In the fourth stage, the health organizations should decide on the responsible for publishing the message. IT department, health education department or public health department can be responsible for this stage. In the fifth stage, organizations can employ a wide range of social media platforms to deliver their health messages.

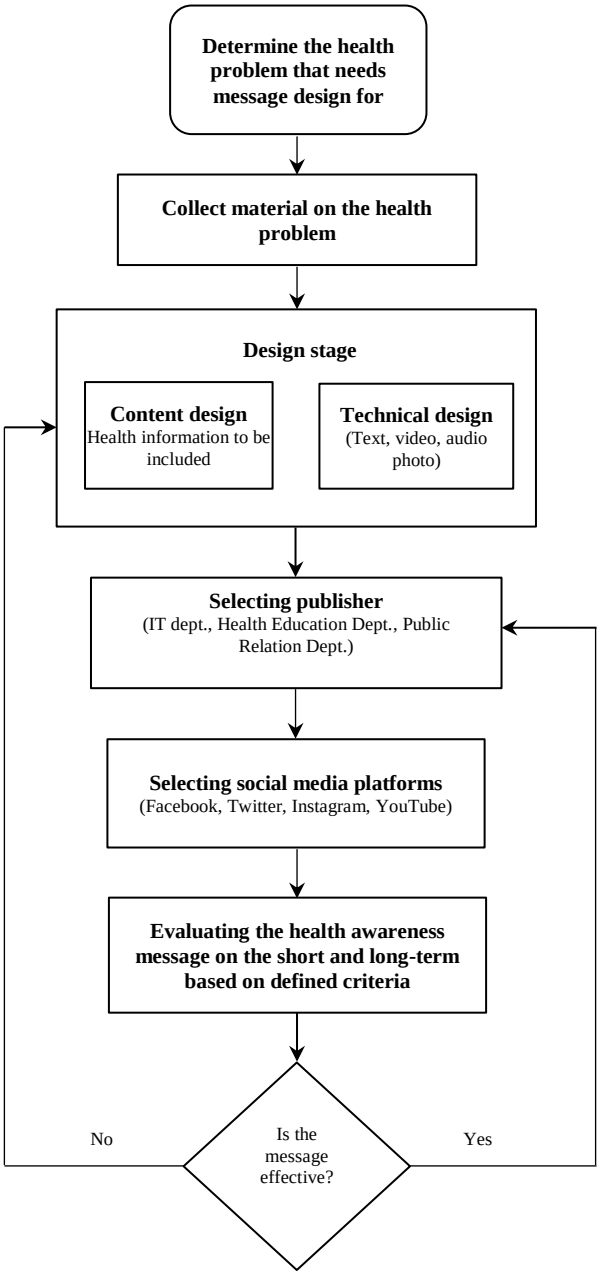

Figure 10. A proposed framework for publishing health awareness using social media

The most effective platforms are Facebook, Twitter, WhatsApp and Snapchat. Since Twitter has seen exponential growth in the use of health promotion, it is important to find out the factors that attribute tweets to be effective and impactful in delivering the health awareness message. Twitter allows users to communicate and interact with followers in messages called a tweet with a maximum length of 280 characters. A tweet can be included with a photo or a video and link to the primary source (URL) [13][14]. According to global Statics [15], Twitter has an estimated 330 million active users per month. There are many features that reinforce the level of engagement in Twitter such as retweets, likes, mentions and replies [16]. In the sixth stage, organizations evaluate the impact and effectiveness of the health awareness message on the short and long-term. On the short-term, organizations can use observations, patient's comment on social media or direct questions to assess the impact of health

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awareness message. On the long-term, organization can use one of any statistical methods, the amount of drug consumed is reduced, severity of disease's conditions is reduced or increased the number of people who are doing the early detection of specific disease and its complications to evaluate the effectiveness of the health awareness message. The results of the evaluation process determine the actions of health organizations regarding the health message. If the message was effective, the organizations can then contain publishing the message. However, if the message is ineffective, the organizations should go back and improve both the content and technical design of the message

V. CONCLUSION AND FUTURE WORK

This paper aims to enhance our understanding of the process of publishing health awareness message via social media platforms. To this end, a survey was administered to selected health organizations to understand the current state and practices of publishing health awareness message to the public. The analysis of current practices revealed that the process lacked a systematic and unified approach to publish health message. The health organizations varied considerable in terms of the social media platforms used, content writer, designer, publisher and content elements. Although the use of wide range of social media platforms may enable organizations to reach a wide number of audiences, it may affect their ability to receive and understand resulted from information overload. To address this, this paper developed a unified framework for publishing health awareness message.

The area of social media in health communication is still in its infancy [22][23][24]. Future research could explore factors influencing individual's intentions to use social media for health information. For example, one could draw on the Theory of Planned Behaviours to understand how attitudes, social pressure (family and friends) and behavioural control variables may influence their intentions to use and look for health information on social media platforms. Another research opportunity is to investigate, using experiments methods, attributes of effective health awareness message from the individual's perspective. This will inform the health policymakers and practitioners design of effective health message.

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