



Aligning the Maqasid al-Shariah and Qawa'id al-Fiqhiyyah to the Development of a Mobile Application for Early Breast Cancer Detection

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Abstract

Breast cancer can lead to a decreasing quality of life, increasing mortality rate and financial implications for treatment. Many mobile applications (apps) such as Mobile Health or Health apps have been used widely to promote early detection, prevention and, provide care and support for cancer patients and survivors. However, apps that are specifically developed to give awareness towards breast screening practices such as breast self-examination and mammography among Malaysian women are scarce. Efforts should be done to develop a mobile app that can be used to encourage breast cancer awareness and facilitate breast screening practices among Malaysian women. These efforts should be seen within the concept of the Health Belief Model, that is directed towards health promotion and disease prevention. This paper attempts to align the development of this app with the objectives and principles of the *Shariah*. The work begins with the explanation on the current issues in breast cancer. This is followed by recognising mobile technologies as a health promotion tool for encouraging early breast cancer detection. The core discussions on the development of a breast cancer app to encourage women in performing breast screening practices will be based on the *Maqasid al-Shariah* (objectives of Islamic law) as well as *Qawaid al-Fiqhiyyah* (Islamic legal maxims). It is hoped that this paper will open further discussions on the incorporation of Islamic perspectives in the field of information and communications technology (ICT), especially in the area of app development within the healthcare sector.

Keywords: mHealth, Apps, Breast Cancer, *Maqasid al-Shariah*, *Qawaid al-Fiqhiyyah*

Abstrak

Kanser payudara boleh menyebabkan penurunan kualiti hidup, meningkatkan kadar kematian dan implikasi kewangan untuk rawatan. Banyak aplikasi mudah alih (apps) seperti aplikasi Kesihatan Mudah Alih (Mobile Health) atau Aplikasi Kesihatan telah digunakan secara meluas untuk menggalakkan pengesanan awal, pencegahan dan menyediakan penjagaan dan sokongan untuk pesakit dan mangsa kanser. Walau bagaimanapun, aplikasi yang dibangunkan khusus untuk memberi kesedaran terhadap amalan pemeriksaan payudara seperti pemeriksaan payudara secara sendiri dan mamografi di kalangan wanita Malaysia adalah terhad. Usaha harus dilakukan untuk membangunkan aplikasi mudah alih yang boleh digunakan untuk menggalakkan kesedaran mengenai kanser payudara dan memudahkan amalan pemeriksaan payudara dalam kalangan wanita Malaysia. Usaha ini harus

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dilihat dalam konsep Model Kepercayaan Kesihatan (Health Belief Model), yang menjurus kepada promosi kesihatan dan pencegahan penyakit. Artikel ini cuba menyelaraskan pembangunan aplikasi ini dengan objektif dan prinsip Syariah. Hasil kerja ini dimulakan dengan penjelasan mengenai isu semasa mengenai kanser payudara. Ini diikuti dengan

mengidentifikasi teknologi mudah alih sebagai alat promosi kesihatan untuk menggalakkan pengesanan awal kanser payudara. Perbincangan teras tentang pembangunan aplikasi kanser payudara untuk menggalakkan wanita melakukan amalan pemeriksaan payudara akan dijelaskan berdasarkan *Maqasid al-Shariah* (objektif undang-undang Islam) serta *Qawaid al-Fiqhiyyah* (prinsip perundangan Islam). Artikel ini diharapkan dapat mencetus perbincangan mengenai penggabungan perspektif Islam dalam bidang teknologi maklumat dan komunikasi (ICT), terutamanya bidang pembangunan aplikasi dalam sektor penjagaan kesihatan.

Kata kunci: mHealth, Aplikasi (Apps), Kanser Payudara, *Maqasid al-Shariah*, *Qawaid al-Fiqhiyyah*

Introduction

Breast cancer is the most common life-threatening cancer diagnosed in women globally. Data from the American Cancer Society projected that 279,100 new cases of breast cancer will be discovered among the women of the U.S in 2020 (American Cancer Society, 2020). On average, about 1 in 8 women in U.S have a chance of developing breast cancer during her lifetime. For the same year it is anticipated that 42,690 deaths due to breast cancer will occur. In Malaysia, breast cancer is ranked first among the most prominent cancers (34.1%) that affect women (Ministry of Health Malaysia, 2019). According to the second five-year report of the Malaysian National Cancer Registry 2012-2016, there is a significant rise in the incidence rate of breast cancer cases throughout the five-year period. The report further stated that the age standardised incidence rate (ASR) has risen from 31.1 in the previous report to 34.1 per 100,000 women which translates to the overall lifetime risk of 1 in 27 women in the country.

Having breast cancer would largely affect the health-related quality of life among the patients. Breast cancer patient will be affected by "fatigue, pain, lymphoedema, lowered bone density, changes in weight, changes in mood, hair loss or the side effects of early menopause" (Breast Cancer Network Australia, 2018). This disease would also lead to other severe implications by affecting psychological well-being, as well as increasing mortality rate and the ensuing expenses for the treatment. The most common form of breast cancer treatment is through surgical intervention. In the case of an inoperable type of tumor, other methods would be recommended namely, chemotherapy, radiation therapy, targeted therapy or hormonal therapy. Breast cancer patients diagnosed at the earliest stage (90%) survived the disease for at least five

years in comparison with patients who presented with the final stage (15%) (Cancer Research UK, 2018). This is because when a tumor is found early it is less aggressive and may be easier to treat.

Despite the availability of a number of treatments for breast cancer, the key to a successful treatment is the early detection of the disease. Breast screening practices is a priority agenda in the early detection of breast cancer. Reductions in mortality risks associated with the participation of the patients in an organized mammography screening had been found (Tabár et al., 2018). For these reasons, regular breast cancer screening through BSE and mammography is crucial for early-stage cancer detection. Thus, an effective breast screening program is useful in early breast cancer detection that can contribute to substantial decrease in deaths due to breast cancer.

An encouraging approach towards early detection of cancer is through the implementation of Mobile Health (mHealth) apps. According to the Foundation for the National Institutes of Health (2009), mHealth is defined as "the delivery of healthcare services via mobile communication devices". The use of mobile apps as a health promotional tool in the field of cancer include, tracking the presence of skin cancer (Miiskin app, UMSkinCheck), estimating risk of developing colorectal cancer (Colorectal Cancer Risk Assessment Tool) and, learning about cervical cancer (Mobile Learning for Early Detection Cervical Cancer). These had accentuated the potential for developing mobile application as health promotion tools to facilitate early breast cancer detection.

There have been previous attempts to encourage breast screening such as developing a mobile application to encourage BSE among women in Korea (Heo et al., 2013) and creating mobile applications to educate on early breast

cancer detection in Indonesia (Muljo, Perbangsa, Yulius & Pardamean, 2018). The assessment on the usefulness of these mobile apps was focused only on specific populations in the said studies. Currently in Malaysia, concerns towards the increased incidence of breast cancer as well as the lack of awareness towards the disease still exist (Lee, 2019).

Taking into consideration the differences in population demographics in the above-mentioned studies, it is felt that there is a need to develop an app that serves to predict women's intention in adopting breast self-examination (BSE) and mammography for Malaysian women. The app will also examine demographic information of users and their health beliefs towards breast cancer and breast screening practices among others. It is hopeful that the app can eventually provide information on how to increase awareness towards breast cancer, recommend for BSE or advise the user to schedule an appointment for a mammography screening. The development of this app will be in line with the effort for early detection of the disease which is integral to improve breast cancer outcomes and survival.

To the best of the author's knowledge, there is a dearth of literature that incorporates Islamic essences in the technological development of mobile application. Thus, an attempt is made in this opinion paper to present the development of the app based on Islamic interpretation within the context of *Maqasid al-Shariah* (objectives of Islamic Law) and *Qawaid al-Fiqhiyyah* (Islamic legal maxims).

Summary of *Maqasid al-Shariah*

Shari'ah is defined as the Islamic law which consists of the rules that are obligatory upon Muslims by virtue of their religious belief. The primary sources of the Islamic law are the *Qur'an* and the *Sunnah*. *Maqasid al-Shariah* comprises the objectives or purposes behind the revelation of Islamic law and rulings. Historically, the *Maqasid al-Shariah* was introduced by Imam al-Syafi'e (767 - 820) in the eighth century through his book on Islamic jurisprudence named *al-Risalah* (Al-Qarafi, 2000). Following al-Syafi'e, other Islamic jurists who contributed to the *Maqasid* theory

included Abu al-Maali al-Juwaini, Abu Hamid al-Ghazali, al-Izz Ibn Abdul-Salam, Shihabuddin al-Qarafi, Shamsuddin Ibn al-Qayyim, and Abu Ishaq Al-Shatibi. *Maqasid al-Shariah* is further classified into three categories which are *Dharuriyyat* (necessities), *Hajiyyat* (needs), and *Tahsiniyyat* (luxuries). Amongst these, the most significant is *Dharuriyyat*, where it is seen as a requirement for survivability and spiritual well-being of humans. The absence of this element may lead to harm and damage to mankind.

Al-Juwaini had expounded the objective of *Shari'ah* as to preserve and protect the *maslahah* (public good). Al-Ghazali in his writings *al-Mustasfa*, further ranked the 'necessities' in clear order which encompasses the safeguarding of faith, life, intellect, progeny, and property. A Maliki jurist, al-Qarafi added a sixth, namely the safeguarding of honour in addition to the five essentials (Auda, 2008). Al-Ghazali believes that the ultimate purpose of *Shari'ah* law is to 'safeguard' or preserve those essentials, which eventually bring benefit for human life. Al-Tufi (1989) derived the conclusion that "the preservation of these objectives consists of both 'attracting utility' (*jadhb al-naf'*) and 'repelling harm' (*raf' al-Darar*), and should be used as the major source of law after the *Qur'an* and the *Sunnah*".

The Application of *Maqasid al-Shariah* in Breast Cancer App Development

The development of mobile application pertaining to breast cancer can be seen within the context of *Hajiyyat* (needs). The aim of the app development which is for promoting early breast cancer detection is deemed as necessary to alleviate the hardship and difficulties that may follow due to the late diagnosis of cancer among women. In terms of *Tahsiniyyat* (luxuries), the presence of this app is of the aim to encourage women to take good care of their health which Islam recommends. Thus, the effort to seek for better quality of life through the development of the app is also parallel with the *Tahsiniyyat* perspective in which to attain refinement and perfection in life. Taking the discussion further, the justifications to develop the app will be based on the *Maqasid* classification of *Dharuriyyat* (necessities) that consisted of 6 (six) aspects. These are given below:

Protection of Faith

In the context of healthcare, the protection of faith primarily involves the preservation and promotion of good health that facilitate Muslims in performing their spiritual duties (*ibadat*) (Kasule, 2008). Having breast cancer and its treatment can affect the physical wellness of a sufferer. Breast cancer patients suffer from several effects which predominantly are pain and fatigue (Breast Cancer Network Australia, 2020). The physical effects can considerably influence the quality in performing religious duties of worship among breast cancer patients. These include performing five times daily prayer (*Solah*), performing *Hajj* (pilgrimage) to Mecca and fasting in the month of Ramadan, which are the essential rituals to the Muslim faith.

The development of the app is in line with the Islamic concept to preserve the above rituals. The potential of the technology for early breast cancer detection is an effort to promote health which subsequently can facilitate Muslim in performing the religious duties that could help to preserve and further enhance the faith of Muslim patients.

Protection of Soul

Islam commands specific duties on each Muslim with respect to the protection of soul. Our body and soul belong to Allah *Subhanahu wa Ta'ala* and these are entrusted to us on a temporary basis. It is important for us to take care of our body and prevent ourselves from harm as Allah *Subhanahu wa Ta'ala* mentions, "Do not cast yourselves into destruction." (The Qur'an, 2:195). The development of the app is an effort to preserve life by functioning as a health-promotional tool for breast cancer. The use of the fore-mentioned app to encourage the adoption of women towards breast screening practices can lead to positive outcomes by reducing mortality rate. By embracing this app, women will be advised to check their breasts in a regular manner each month. Regular inspection of the breasts will allow women to understand the normal feel and appearance of their breasts as well as observe any changes that may be the sign of cancer. Successful development of the app can help in promoting women to do breast examination to detect breast cancer at an early and curable stage. The early detection can help to preserve life through better

management of disease and treatment options for the patient.

Protection of Wealth

Breast cancer can lead to financial toxicity, defined as the healthcare costs and financial burden for patients. It is a significant problem for cancer patients and may contribute to high psychosocial distress, reduce patient outcomes, and diminish quality of life (Snyder & Chang, 2019) through stress and financial worry as a result of the obligation to pay medical bills (Yabroff et al., 2016). The financial costs in managing cancer do not affect just the patient, but the nation as a whole. A projection from the National Cancer Institute suggested that the medical expenses for breast cancer by 2020 will reach \$20.5 billion, which is more than other malignancies (Mariotto, Robin Yabroff, Shao, Feuer & Brown, 2011). This projection also assumes that the expenditure for cancer care will continue to increase since more advanced and higher cost treatment options are adopted for the delivery of healthcare. Protection of wealth in *Maqasid al-Shariah* involves the rulings on how wealth should be earned and spent, in accordance with Islamic principles. Poverty as a result of financial toxicity has negative implications on Muslims' beliefs as a hadith stated: Poverty can lead to *Kufr* (loss of faith) (Shu'ab Al-Iman lil Bayhaqi, hadith no. 486). Indisputably poverty can pose difficulty in obedience to Allah *Subhanahu wa Ta'ala*.

Early diagnosis of breast cancer through the use of the app has the potential to substantially reduce financial impact. This is owing to the fact that the costs for treating early-diagnosed cancer patients are two to four times lower compared to treating patients with an advanced-stage cancer (Sun, Legood, Dos-Santos-Silva, Gaiha, & Sadique, 2018). The reduced expenditure in treatment cost can contribute to the preservation of wealth among patients. The efficiency in delivering treatment as a result of early detection can also reduce the burden of the nation's healthcare cost, which therefore can preserve the nation's economy in the long run.

Protection of Mind

Allah *Subhanahu wa Ta'ala* has granted humans the gift of intellect to distinguish them from other creatures. It is our responsibility to preserve our

mind in order to carry the duty as the successors on earth. In relation to app development, it is an effort of man to utilize their intellect and skills to create a technology that can be beneficial to others. The purpose of the app development is to initiate interventions for a behaviour change where users are encouraged into adopting the breast screening practices. The use of the intellect among researchers for the aim of helping others fulfils the moral and religious obligations within the concept of *habluminannas* (relationship with other people) as Islam champions. It is inevitable that being diagnosed with a severe disease like breast cancer can cause substantial psychological issues that can affect the mind such as depression, anxiety, sleep troubles and other mental health illnesses (Fiorentino, Rissling, Liu, & Ancoli-Israel, 2011). Having a regular breast self-examination and mammography as recommended through the app is a promising approach to ensure psychological relief amongst women. Getting a negative or normal result of the mammography screening can give woman a psychological benefit in terms of a peace of mind (Fuller, Lee & Elmore, 2015). The potential of the technology as a health promotional tool for early breast cancer detection may preserve the mind of Muslim patients by sustaining and further strengthening their mental health.

Protection of Offspring

Marriage is legislated in Islam as a means to preserve the lineage. Al- Ghazali (1058 – 1111) in his writings on the Etiquette of Marriage from the *Ihya 'ulum al-din*, had explained that the virtue of marriage is related to the virtue in having offspring and procreation. A possible concern of breast cancer patients is the probable implications of the treatment towards their marriage. This is because breasts symbolize femininity and attractiveness for women, the loss of one or both breasts are often associated with the fear of rejection by her spouse. Even though breast-reconstructive surgery has been a treatment option following mastectomy, the fear of rejection may still exist due to changes in appearance and feel of the breast (Walter & Lehu, 2011). This could cast an implication on the intimacy between spouses which may affect the lineage of offspring in a family. Other treatments

such as chemotherapy (use of drugs) and radiation therapy (use of high-energy radiation) may also have a considerable effect on the reproductive system. This is because the deterioration in production of female reproductive cells that results from the cancer treatments may lead to temporary or permanent loss of fertility which can reduce the chance of pregnancy after the cancer treatment (American Cancer Society, 2017). Early detection can help prevent these issues. When cancer can be detected at an early curable stage, it will lead to an increased availability of treatment options (Virtual Medical Centre, 2011). This will reduce chances of women to encounter severe problems that can affect the protection of lineage including sexual dysfunction and infertility.

Protection of Honour

The protection of honour is defined as the protection of human dignity (al-Alyubi, 1995). The preservation of dignity is closely aligned with the maintenance of privacy and confidentiality of the patient. The obligation in the development process of the app is to ensure the protection against inappropriate disclosure of the users' personal information. Personal user data has market value for generating profits in this digital age (European Union Agency for Cybersecurity, 2018). The ethical aspect of medical app calls for guarding against the act of selling the data to a third party (Sharp & O'Sullivan, 2017). As long as the development of the app can observe the ethical aspect associated with privacy and confidentiality of patient, it should be permissible since it complies with the protection of honour of the Muslim users.

Summary of Qawaid al-Fiqhiyyah

Qawaid al-Fiqhiyyah (Islamic legal maxim) is closely related to *Maqasid al-Shariah*. Al-Zarqā (2007) defined *qawaid* as the “general fiqh principles which are presented in a simple format consisting of the general rules of *Shari'ah* in a particular field related to it”. These legal maxims are used for cases that fall under common rulings which functioned to deduce the rules of *fiqh* and provide guidelines for determining specific *hukm* (Saiti & Abdullah, 2016). The five leading maxims include; (1) Principle of Intention (acts are judged by the intention behind them), (2)

Principle of Certainty (certainty is not overruled by doubt), (3) Principle of Injury (harm must be eliminated), (4) Principle of Hardship (hardship begets facility) and (5) Principle of Custom (customary usage is the basis of judgement). These principles are applicable to discuss the rulings of new occurrences in which there is no clear statement in the Holy Quran, *Sunnah*, or *ijma'* (Kasule, 1997).

The Application of *Qawaid al-Fiqhiyyah* in Breast Cancer App Development

Acts are Judged by the Intention

This principle is derived from the hadith, 'The reward of deeds depends upon the intentions' (Sahih Al-Bukhari, hadith no. 1). In the literal sense, the word intention means the desire or purpose of someone to do something. The purpose of the development of the app is to provide women a tool that can encourage them to undertake breast screening. Regular examination of the breasts will help women to notice any changes that may be the symptoms of breast cancer at an earlier stage. The intention for early detection is to avoid more detrimental effects of cancer if it is detected at the later stages of the disease. Man is reminded to instill the virtue of sincerity along with intention in order to seek blessings from *Allah Subhanahu wa Ta'ala*. The Prophet Muhammad ﷺ said in a hadith: "Verily, the people will be raised for judgment only according to their intentions" (Sunan Ibn Mājah, hadith no. 229). Indeed, sincerity is the obligatory prerequisite for the blessed path towards eternal life in the Hereafter. The researchers are thus reminded to have the right and sincere intention in developing the app for the purpose of seeking blessing from *Allah Subhanahu wa Ta'ala*. With this in mind, sincerity in intention will turn every action into rewarded acts of worship.

Certainty is not overruled by doubt

This maxim explains that any matter confirmed to have existed with certainty remains certain until proven with evidence to be otherwise. The matter of certainty is much related to the concept of '*Ilm-al-Yaqeen*' (knowledge of certainty) in Islamic *tasawwuf* (sufism) (ElSenossi, n.d). It is the first type of *yaqeen* (certainty) derived from the certainty based on knowledge and learning.

In the context of the app, the outcome of its usage is to provide users with the standard recommendation and guidelines for breast screening as mandated by regulatory bodies such as the World Health Organization (WHO). This is for the purpose of following the existing customary guidelines in medical practice until new evidence proves otherwise. The implementation of standardized guidelines and information is in accordance with the concept of certainty in Islam that will further establish the credibility of the app. This will be especially important because the information may have a significant effect on the health care outcomes.

Harm must be eliminated

The concern on ethical issues revolves around the safe development of the app. This is for the purpose of not causing harm to the patient using it or to those who rely on the content of information in the app. This is because the adherence of users towards the information in the app may have an effect on the health of the users. It is important for the system and information of the app to be constantly updated in order to conform to progress in medicine (Sharp & O'Sullivan, 2017). It is necessary to ensure all the contents in the app is in line with the current guidelines related to breast cancer and breast screening practices. The emphasis on these aspects can maintain the users' trust with the app and avoid false sense of security. It is important to ensure that the development of the app will not pose any form of harm or risk to the patient by updating the content of the app with the recent medical guidelines.

Future direction for the Breast Cancer App Development

Mobile apps development presents an opportunity to transform healthcare delivery among women by instilling awareness towards breast cancer and encouraging breast cancer practices. In the future, the researcher intends to develop a breast cancer app that can inform women of their status of behavioural adoption towards breast screening practices by relating their input based on the constructs of the Health Belief Model. The Health Belief Model is a psychological model that attempts to explain and predict health behaviours by focusing on the attitudes and beliefs of

individuals. Based on the outcome of their behavioural adoption, necessary actions for risk reduction from breast cancer will be suggested to the app users. The suggestions could include providing information in increasing awareness towards breast cancer, recommending for breast self-examination or advising the user for scheduling a mammography screening. The development of the app under the lens of *Maqasid al-Shariah* and *Qawaid al-Fiqhiyyah* framework can become the basis for the future design and development of the app. It is hoped that the future use of the app will bring benefit to Malaysian women in terms of exposing awareness on breast cancer as well as enhancing screening programs for the risk reduction from breast cancer. The notion to bring benefit to others in order to gain His blessing was conveyed to Muslims by Prophet Muhammad ﷺ in a hadith narrated by Ibn Umar where the Prophet said, "The most beloved people to Allah *Subhanahu wa Ta'ala* are those who are most beneficial to people..." (Al Tabarani, 2012, Al-Mu'jam Al-Awsat, Beirut: DKI).

Conclusion

This work presents Islamic insights in the development of an app to encourage early breast cancer detection based on the *Maqasid al-Shariah* (objectives of Islamic law) and *Qawaid al-Fiqhiyyah* (Islamic legal maxim). Breast cancer causes several implications including decreased quality of life along with increasing mortality rate and expenses for treatment. The introduction of mobile Health or mHealth apps can strengthen the efforts in promoting health by encouraging breast cancer awareness and detection. The paper highlights the Islamic interpretations on the implications of the app development upon the individual woman and the healthcare researcher. The use of the intellectual capacity along with the good intention of the researcher are to bring forth benefit to human beings by observing, contemplating, thinking, formulating and developing the app. The effort of researchers in developing the app in compliance with the Islamic principles can be regarded as fulfilling both of the Maqasidic and Qawaidic aspects. It is hoped that this paper will open further discussions on the incorporation of Islamic perspectives in the field of information and communications technology

(ICT), especially in the area of app development within the healthcare sector. *Wallahu'alam.*

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