

ANTIOXIDANT DRINKS IN THE QURAN MOBILE APPLICATION

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Received: 28 June 2024

Article Progress
Revised: 24 July 2024

Accepted: 28 August 2024

Abstract	<p><i>The consumption of antioxidant-rich foods and beverages has gained considerable attention due to their role in maintaining optimal health and preventing chronic diseases. Milk, a widely consumed beverage, and other drinks such as honey and ginger have all emerged as sources of antioxidants. These beverages contain a variety of bioactive compounds, such as vitamins, minerals, and phytochemicals, which contribute to their antioxidant capacity. Scientific studies have shown that the consumption of these antioxidant drinks can reduce oxidative damage, improve cardiovascular health, boost immune function, and potentially mitigate the risk of certain diseases, including cancer. This paper aims to collect the relevant ayahs related to antioxidant drinks mentioned in the Quran and to develop an interactive mobile application that focuses specifically on Quranic references to antioxidant drinks. The research follows the ADDIE instructional design model, encompassing five essential phases: analysis, design, development, implementation, and evaluation. The findings of this research will enhance comprehension of the Quran's teachings regarding antioxidant drinks and their potential benefits.</i></p> <p>Keywords: <i>Antioxidant, Drink, Quran, Mobile, Application.</i></p>
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INTRODUCTION

Numerous *ayahs* in the Quran speaks of the significance of seeking knowledge and the preservation of well-being, including those *ayahs* addressing the subjects of sustenance, food and beverages both in the worldly and the hereafter contexts. However, the Quran does not directly describe the consumption of antioxidant drinks or introduce specific terminologies for them in all contexts.

The Quran does not elaborate scientific or medical delineations concerning categories of sustenance, encompassing concepts such as antioxidant beverages. This is due to the fact that the multifaceted nature of the *ayahs* pertaining to these provisions were revealed within diverse contexts and are imbued with specific connotations and intentions beyond the sole consideration of health-related benefits.

The lack of sufficient evidence and references supporting the claimed health benefits of antioxidant drinks within the Quran application compromises its credibility and reliability. By integrating scientifically verified data, the application has the potential to furnish its users with precise counsel, thereby cultivating well-informed decision-making and fostering heightened user confidence.

In general, the role of the antioxidant is to furnish an electron to mitigate the destabilizing effects of free radicals, thereby preventing them from causing cellular damage.¹ Food or drink derived from both animal and plant such as milk, honey, ginger and camphor are acknowledged for their intrinsic health-promoting attributes and are esteemed for their potential health benefits.

Earlier research from Taylor and T. Richardson² suggests that milk originating from mammals, particularly cows, is a rich source of essential nutrients such as calcium, protein, vitamins and minerals, making it an important part of a balanced diet. Honey represents yet another liquid product crafted by bees. Research from Al-Mamary and others³ elucidates the recognized antibacterial properties, throat-soothing qualities and potential antioxidant properties, encompassing phenolic compounds and flavonoids, associated with honey.

Shanmugam and others⁴ discovered that ginger has anti-inflammatory antioxidant properties and can aid digestion. According to Drikvandi and others⁵, although camphor cannot be consumed orally, it can be used topically or inhaled for various purposes and has traditionally been used for its soothing and cooling properties.

LITERATURE REVIEW

Milk in the Quran

Milk of livestock is stated in the Quran using certain terms, either general or specific terms, as described in Table 1. The general terms are (*masyarib*) in Surah Yasin 36:73 and (*mimma fi buṭun*) in Surah al-Mukminun 23:21 and al-Naḥl 16:66. The specific term is (*laban*), such as in Surah al-Naḥl 16:66 and Surah Muhammad 47:15.

Table 1: *Ayahs on Laban, Masyarib and Mimma fi Buṭun (Milk)*

Surah & Ayah Number	Ayahs on Laban, Masyarib and Mimma fi Buṭun (Milk)
Yasin 36: 73	وَلَهُمْ فِيهَا مَنَافِعُ وَمَشَارِبٌ أَفْلا يَشْكُرُونَ
Al-Mukminun 23:21	وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً نُّسْقِيكُم مِّمَّا فِي بُطُونِهَا وَلَكُمْ فِيهَا مَنَافِعُ كَثِيرَةٌ وَمِنْهَا تَأْكُلُونَ
Al-Nahl 16:66	وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً نُّسْقِيكُم مِّمَّا فِي بُطُونِهَا مِنْ بَيْنِ فَرْثٍ وَدَمٍ لَبَنًا خَالِصًا سَائِغًا لِلشَّارِبِينَ
Muhammad 47:15	مِثْلُ الْجَنَّةِ الَّتِي وَعَدَ الْمُتَّقُونَ فِيهَا أَنْهَارٌ مِنْ مَاءٍ غَيْرِ آسِنٍ وَأَنْهَارٌ مِنْ لَبَنٍ لَمْ يَتَغَيَّرْ طَعْمُهُ وَأَنْهَارٌ مِنْ حَمْرٍ لَذَّةٍ لِلشَّارِبِينَ وَأَنْهَارٌ مِنْ عَسَلٍ مُصَفًّى وَلَهُمْ فِيهَا مِنْ كُلِّ الثَّمَرَاتِ وَمَعْفَرَةٌ مِنْ رَبِّهِمْ كَمَنْ هُوَ خَالِدٌ فِي النَّارِ وَسُقُوا مَاءً حَمِيمًا فَقَطَّعَ أَمْعَاءَهُمْ

¹ Grover, A. K. et al. (2015). Benefits of Antioxidant Supplements for Knee Osteoarthritis: Rationale and Reality. *Nutrition journal*, 15(1), 1-13.

² Taylor & T. Richardson. (1980). Antioxidant Activity of Skim Milk: Effect of Heat and Resultant Sulfhydryl Groups. *Journal of Dairy Science*, 63(11), 1783-1795.

³ Al-Mamary, et al. (2002). Antioxidant Activities and Total Phenolics of Different Types of Honey. *Nutrition research*, 22(9), 2.

⁴ Shanmugam, et al. (2011). Protective Effect of Dietary Ginger on Antioxidant Enzymes and Oxidative Damage in Experimental Diabetic Rat Tissues. *Food Chemistry*, 124(4), 1436-1442.

⁵ Drikvandi, P. et al. (2020). Modulation of the Antioxidant Defense System in Liver, Kidney and Pancreas Tissues of Alloxan-Induced Diabetic Rats by Camphor. *Journal of Food Biochemistry*, 44(12), e13527.

Stobiecka and others ⁶ discovered the importance of antioxidants in milk and dairy products for promoting health and preventing oxidative stress-related diseases. The type of milk, culture used and the addition of probiotic strains and plant additives can enhance the antioxidant capacity of dairy products like kefir and yogurt. The enrichment of dairy products with other antioxidants such as red ginseng extract, blackberry flowers, honey and grape extracts can improve their shelf life and health benefits.

Honey in the Quran

The Quran pronounces honey with two terms which are (*syarab*) and (*'asal*) in two *ayahs*, as described in Table 2:

Table 2: *Ayahs* on *Syarab* and *'Asal* (Honey)

Surah & Ayah Number	<i>Ayahs</i> on <i>Syarab</i> and <i>'Asal</i> (Honey)
Al-Nahl 16:69	ثُمَّ كُلِي مِنْ كُلِّ الثَّمَرَاتِ فَاسْلُكِي سُبُلَ رَبِّكِ ذُلُلًا يَخْرُجُ مِنْ بُطُونِهَا شَرَابٌ مُخْتَلِفٌ أَلْوَانُهُ فِيهِ شِفَاءٌ لِلنَّاسِ إِنَّ فِي ذَلِكَ لَآيَةً لِقَوْمٍ يَتَفَكَّرُونَ
Muhammad 47:15	مَثَلُ الْجَنَّةِ الَّتِي وَعَدَ الْمُتَّقُونَ فِيهَا أَنْهَارٌ مِنْ مَاءٍ غَيْرِ آسِنٍ وَأَنْهَارٌ مِنْ لَبَنٍ لَمْ يَتَغَيَّرْ طَعْمُهُ وَأَنْهَارٌ مِنْ حَمْرٍ لَذَّةٍ لِلشَّارِبِينَ وَأَنْهَارٌ مِنْ عَسَلٍ مُصَفًّى وَلَهُمْ فِيهَا مِنْ كُلِّ الثَّمَرَاتِ وَمَعْفَرَةٌ مِنْ رَبِّهِمْ كَمَنْ هُوَ خَالِدٌ فِي النَّارِ وَسُقُوا مَاءً حَمِيمًا فَقَطَّعَ أَمْعَاءَهُمْ

Among the antioxidant properties that are found in Tualang honey, a local honey product from Malaysia are phenolic and polyphenolic. Mohamed and others ⁷ found that Tualang honey exhibits antioxidant and antiradical activity. Erejuwa and others ⁸ disclosed that antioxidant properties in honey possess potential benefits in managing chronic diseases such as improving glycaemic control in diabetes mellitus and reducing blood pressure in hypertension.

A study from Nazri and Mansor ⁹ suggests that milk and honey should be included in daily diets because they contain beneficial antioxidant compounds and numerous health benefits. The study proposes of consuming them to preserve the dietary traditions in Saudi Arabia, to promote a balanced diet and to prevent disease.

Camphor in the Quran

The Quran does not speak of camphor in specific, as described in Table 3. Surah al-Insan 76:5 describes a specific characteristic of camphor drink in paradise. It will be served in a container (cup) or (*ka's*).

Table 3: *Ayah* on *Kafur* (Camphor)

Surah & Ayah Number	<i>Ayah</i> on <i>Kafur</i> (Camphor)
Al-Insan 76:5	إِنَّ الْأَبْرَارَ يَشْرَبُونَ مِنْ كَأْسٍ كَانَ مِزَاجُهَا كَافُورًا

⁶ Stobiecka, et al. (2022). Antioxidant Activity of Milk and Dairy Products. *Animals*, 12(3), 245.

⁷ Mohamed, M et al. (2010). Studies on the antioxidant properties of Tualang honey of Malaysia. *African Journal of Traditional, Complementary and Alternative Medicines*, 7(1).

⁸ Erejuwa, O. et al. (2012). Honey: A Novel Antioxidant. *Molecules*, 17(4), 4400-4423.

⁹ Nazri, N. M. Z., & Mansor, A. N. I. (2022). An Analysis on Antioxidant Drinks during the Prophet's Time in Makkiah Context. *Jurnal Islam Dan Masyarakat Kontemporari*, 23(3), 127-135.

Muhamad and others ¹⁰ revealed that camphor leaves have high antioxidant properties hence, it is suitable for medicinal use, particularly in wound healing. Drikvandi and others ¹¹ suggest that camphor has potential therapeutic effects in diabetes by improving glucose metabolism, lipid profile and antioxidant status. Shata and others ¹² found that camphor has some protective effects against DNA damage and biochemical changes in mice.

Ginger in the Quran

The Quran also points out a specific characteristic of ginger drink in paradise, as described in Table 4.

Table 4: Ayah on Zanjabil (Ginger)

Surah & Ayah Number	Ayah on Zanjabil (Ginger)
Al-Insan 76:17	وَيُسْقَوْنَ فِيهَا كَأْسًا كَانَتْ مِرْزَاجُهَا زَنْجَبِيلًا

Some studies suggest that ginger could be a natural source of effective antioxidants and preservative in the food and pharmaceutical industries. Kikuzaki and others ¹³ found that the non-volatile fraction of ginger extract had strong antioxidant activity and certain compounds isolated from ginger showed even higher activity than o-tocopherol. Stoilova and others ¹⁴ suggest that ginger extract could be a promising natural alternative to synthetic antioxidants in various applications because the ginger extract was found to have a high total phenolic content and demonstrated strong scavenging activity against free radicals.

Ginger has potential therapeutic effects in diabetes by reducing oxidative stress and improving organ function. Shanmugam and others ¹⁵ found that ginger supplementation in diabetic rats resulted in dose-dependent hypoglycemic, improved the degeneration of liver cells and sinusoids, protected kidney tissue from degeneration, reduced blood glucose levels and decreased lipid peroxidation in the liver and kidney tissues.

Previous Mobile Applications

The demand for Quranic text accessibility on mobile devices has arisen from the need for convenient access, allowing individuals to carry it with them wherever they go. This enhanced accessibility empowers people to engage in reading, studying and contemplating the Quran's teachings at any time and in any location, thereby deepening their spiritual connection and comprehension. Each mobile application is tailored to serve a specific purpose within its target audience. For instance, the development and evaluation of the MyQiraat mobile application are aimed at facilitating Quranic learning and recitation for

¹⁰ Muhamad, S. H. A. et al. (2019). Antioxidant Activity of Camphor Leaves Extract Based on Variation Solvent. *Journal of Physics: Conference Series*, 1349(1), 1-8.

¹¹ Drikvandi, P. et al. (2020). Modulation of the Antioxidant Defense System in Liver, Kidney and Pancreas Tissues of Alloxan-Induced Diabetic Rats by Camphor. *Journal of Food Biochemistry*, 44(12), e13527.

¹² Shata, et al. (2014). Effects of Camphor on Hepatic Enzymes, Steroids and Antioxidant Capacity of Male Rats Intoxicated with Atrazine. *Middle-East Journal of Scientific Research*, 22(4), 553-560.

¹³ Kikuzaki, H. et al. (1993). Antioxidant Effects of Some Ginger Constituents. *Journal of food science*, 58(6), 1407-1410.

¹⁴ Stoilova, Ivanka, et al. (2007). Antioxidant Activity of Ginger Extract (Zingiber Officinale). *Food chemistry*, 102(3), 764-770.

¹⁵ Shanmugam, et al. (2011). Protective Effect of Dietary Ginger on Antioxidant Enzymes and Oxidative Damage in Experimental Diabetic Rat Tissues. *Food Chemistry*, 124(4), 1436-1442.

Qiraat learners.¹⁶ The 'Say Quran' mobile application was designed to assess student performance, satisfaction and behavior during their study of the Quran.¹⁷

The objective of integrating gamification into educational contexts is to inspire and involve students actively in the learning process. Research conducted by Bustillo and others¹⁸ highlights that the incorporation of mobile applications into language education serves as an efficacious mechanism for enhancing language proficiency, particularly in the domain of listening comprehension.

Digital health applications are designed with the intention of fostering healthy behaviors and effectively managing conditions such as diabetes. In the work conducted by Fleming and others¹⁹, an enumeration of the advantages, obstacles and recommendations pertaining to the utility of these applications is presented. Among the advantages noted is the incorporation of point-based systems and rewards within these applications, which serve as incentives for active user engagement in health management. Among the challenges are limited access for individuals from remote regions or areas of socioeconomic deprivation and the evidence on the long-term effectiveness of these applications is limited. Therefore, this study underscores the imperative for more robust research and comprehensive evaluation efforts in this domain.

Each research framework encompasses a multitude of variables, contingent upon the specific objectives and the intended user base. As an illustration, the 'Say Quran' mobile application encompasses various variables but not limited to perceived utility, user-friendliness, content quality and the design layout of the mobile platform. Data were gathered by means of a systematically constructed questionnaire, which was administered to a cohort comprising 170 students.²⁰

METHODOLOGY

The aim of this project is to create the 'Antioxidant Drinks in The Quran Mobile Application,' which will encompass Quranic *ayahs* pertaining to antioxidant beverages, their translations and their associated health benefits. To achieve this objective, a mixed approach combining both qualitative and quantitative research methods is adopted, ensuring the acquisition of robust and comprehensive data. Qualitatively, content analysis is employed to gather data on Quranic *ayahs*, their translations and articles elucidating the properties of antioxidant compounds and their health benefits.

In adherence to the ADDIE instructional design model, the research is structured around five pivotal phases: analysis, design, development, implementation, and evaluation. This systematic framework is integral to ensuring the attainment of specified research goals.

¹⁶ Ishak, et al. (2016). MyQiraat: An interactive Qiraat mobile application. *4th International Conference on User Science and Engineering (i-USEr)*, 35-39.

¹⁷ Alqahtani, et al. (2015). Mobile applications' impact on student performance and satisfaction. *Turkish Online Journal of Educational Technology-TOJET*, 14(4), 102-112.

¹⁸ Bustillo, J. et al. (2017). Benefits of using a mobile application in learning a foreign language. *Sistemas & Telemática*, 15(40), 55-68.

¹⁹ Fleming, G. et al. (2020). Diabetes Digital App Technology: Benefits, Challenges, and Recommendations. A Consensus Report by The European Association for The Study of Diabetes (EASD) and The American Diabetes Association (ADA) Diabetes Technology Working Group. *Diabetes care*, 43(1), 250-260.

²⁰ Alqahtani, et al. (2015). Mobile applications' impact on student performance and satisfaction. *Turkish Online Journal of Educational Technology-TOJET*, 14(4), 102-112.



Figure 1: ADDIE Model Process

Analysis

Identify the target audience of the Quranic application and their level of engagement with antioxidant beverages. Establish the goals of the section dedicated to antioxidant drinks, including the promotion of healthy diet drink choices. Undertake comprehensive research concerning the presence of antioxidant drinks within Quranic texts and explore their plausible health advantages. Employ surveys to accumulate user input, facilitating an understanding of their inclinations and prerequisites concerning antioxidant beverages.

Design

Create a comprehensive design strategy for the incorporation of the antioxidant drink section within the Quranic application. Define the features and functionalities to be encompassed, which may encompass a collection of antioxidant drink recipes, information concerning the ingredients and their respective health benefits. Design an intuitive and visually appealing user interface for browsing and accessing drink recipes. Consider incorporating options for customization, such as filtering recipes based on ingredients or health benefits.

Development

Execute the devised design strategy by employing appropriate programming languages and frameworks. Construct a structured database to organize the collection of antioxidant drink formulas along with correlated data. Create user interfaces for browsing, searching and viewing individual drink recipes. Implement features like ingredient lists, preparation instructions, nutritional information and related Quranic references. Ensure that the application is responsive and user-friendly.

Implementation

Integrate the antioxidant drink component seamlessly into the pre-existing Quranic application. Test the functionality of the application, ensuring accurate information and proper display of content. Launch the enhanced iteration of the Quranic application, incorporating the novel antioxidant drink section, across pertinent platforms. Disseminate awareness about the new section through application updates, official notifications and social media channels, informing the current user base and enticing prospective users.

Evaluation

Accumulate user input concerning the antioxidant drink section, utilizing mechanisms such as ratings, reviews and feedback forms. Scrutinize the feedback to evaluate the section's effectiveness, applicability and influence on user involvement. Contemplate the possibility of administering user surveys to garner deeper insights into the users' experience and satisfaction. Employ this gathered feedback as a foundation for implementing essential enhancements, which may encompass augmenting the assortment of recipes, refining the user interface, or expanding information pertaining to ingredients and their associated health benefits.

RESULTS

Interface Design

The page features a section dedicated to various types of antioxidant drinks, specifically milk, honey and ginger. Each segment within this antioxidant drinks section incorporates Quranic *ayahs*, accompanied by their translations and an auditory feature. The user interface includes two navigational buttons: one for accessing translations and the other for auditory playback. Selecting the sound icon triggers the playback of the Quranic *ayahs*, while clicking on the 'translate' segment navigates the user to a dedicated subpage for translations.

Within the translation subpage, two distinct icons are provided for further navigation: a left arrow icon enables users to return to the subpage containing the *ayahs*, and a home icon directs users back to the main section categorizing the types of antioxidant drinks. Figure 2 illustrates the interface design for the antioxidant drinks section.



Figure 2: Antioxidant Drinks Interface

Preliminary Design

Page Design

Mobile application Title: Antioxidant Drinks in The Quran Page Title: Main page	
	Screen Layout Description Text: Antioxidant Drinks in the Quran Image: A - Definition of antioxidant drinks in the Quran B - Start icon Colour Background #7DD5E7
	Action - Click on Start icon navigate to type of antioxidant drinks page

Figure 3: Storyboard of Main page

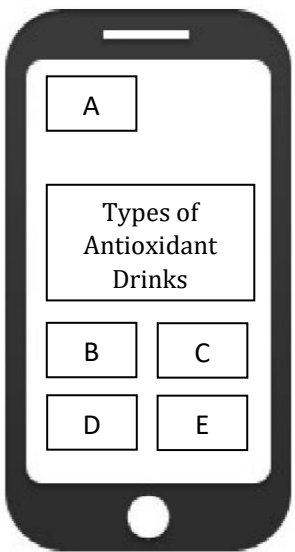
Mobile application Title: Antioxidant Drinks in The Quran Page Title: Main page	
	<p>Screen Layout Description</p> <p>Text: Type of Antioxidant Drinks:</p> <p>Image: A – Home icon B – Milk C – Honey D – Camphor E – Ginger</p> <p>Colour Background #7DD5E7</p> <p>Action</p> <ul style="list-style-type: none"> • Click on type of antioxidant drinks navigate to subpage type of drinks • Click on Home icon navigate to menu page

Figure 4: Storyboard of types of antioxidant drinks

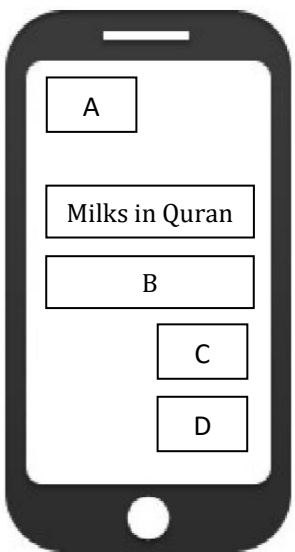
Mobile application Title: Antioxidant Drinks in The Quran Page Title: Main page	
	<p>Screen Layout Description</p> <p>Text: Milk in Quran</p> <p>Image: A – Previous icon B – Quranic <i>ayahs</i> C – Audio icon D – Translation icon</p> <p>Colour Background #7DD5E7</p> <p>Action</p> <ul style="list-style-type: none"> • Click on Previous icon navigate to the previous page • Click on Audio icon to play the <i>ayahs</i> • Click on Translation icon navigate to translation of the Quran page

Figure 5: Storyboard of Quranic *ayahs* for the antioxidant drinks

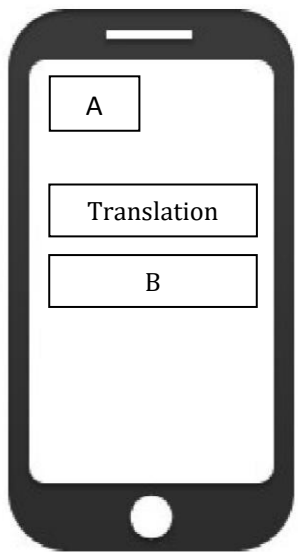
Mobile application Title: Antioxidant Drinks in The Quran Page Title: Main page	
	Screen Layout Description Text: Translation Image: A – Previous icon B – Translation of Quranic <i>ayahs</i> Colour Background #7DD5E7
	Action <ul style="list-style-type: none"> • Click on Previous icon navigate to the previous page

Figure 6: Storyboard of translation Quranic *ayahs*

CONCLUSION

This application serves as a valuable tool to aid individuals in identifying antioxidant beverages stated in the Quran and integrating them into their dietary habits. The application feature such as the translations of Quranic *ayahs* pertaining to antioxidant drinks can facilitate user's comprehension of the meanings. Subsequent research endeavors may consider augmenting this application with additional attributes, such as health-conscious drink recipes for weight management.

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