

## Exploring the Placebo Effect in Faith-Based Water Healing: Impact of Expectation on Mood and Emotional Well-Being

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### ABSTRACT

**Purpose:** This study investigates the role of expectations in faith-based water healing on mood and emotional well-being. It was hypothesised that participants who anticipated prayer-infused water would exhibit higher scores on the Brief Mood Introspection Scale (BMIS), reflecting a more positive mood.

**Methodology:** Data was gathered from both control and experimental groups through pre- and post-test measures. Using SPSS, normality and homogeneity of variance were confirmed (Shapiro-Wilk  $p = 0.327$ ; Levene's  $p = 0.187$ ). Pre-intervention tests showed no significant differences in age ( $t = 0.36$ ,  $p = 0.718$ ) or emotional well-being ( $t = 0.10$ ,  $p = 0.922$ ) between control and experimental groups.

**Findings:** The experimental group demonstrated a significant improvement in emotional well-being ( $M = 94.30$ ) compared to the control group ( $M = 78.79$ ) post-intervention, with a  $t$ -value of  $-3.23$  ( $p = 0.003$ ). Additionally, within the experimental group, emotional well-being significantly increased from pre-test ( $M = 79.45$ ) to post-test ( $M = 94.30$ ), with a  $t$ -value of  $-7.62$  ( $p < 0.000$ ).

**Conclusion:** The findings indicate that the expectation of faith-healing intervention despite the absence of religious elements can produce significant improvements in mood, calling researchers to recognize the role of placebo effects in faith-based research.

### Keywords

Placebo effect, Faith-based water healing, Faith healing, Expectations, Islamic water healing.

### Introduction

It has been recorded that sugar pills [1], sham surgeries [2], and saline injections [3] result in healing outcomes among patients, all while having no medicinal properties. Water is no exception; a study [4] attempted to prove that the water 'listens', and changes its structure according to the nature of the words, sounds and intentions directed towards it, making it capable of healing and causing harm. Among Muslims, the practice of 'praying on' water, which entails the recitation of verses and other Arabic statements, has been used for centuries to heal a multitude of mild illnesses [5] and can extend to extreme psychological disorders as well

[6]. While some believe the prayer causes such a response, others argue that this is mainly the placebo effect at play.

### Placebo

A placebo is a treatment or a procedure that is rendered void of medicinal or therapeutic properties by modern medical science and research, but can result in measurable physiological or psychological effects on an individual. A placebo generally involves convincing or informing the patient that a treatment has healing properties, or even harmful side effects, due to which expectations and beliefs are formed regarding the treatment and procedure [7].

There are two main pathways the placebo affects an illness: The placebo can alter either the experience and perception of the

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symptoms, or it can alter the physiological state of the body. The former brings about subjective, individually experienced changes, while the latter brings about objective, measurable changes [7]. The individual being treated must have a belief that a particular treatment or procedure will be effective, as the extent of the placebo effect is positively associated with the patient's expectation of improvement [8]. Other factors such as characteristics of the treatment such as the size and color of the pill [9], patient characteristics such as spirituality [10], physician characteristics such as warmth and competence [11] are also associated with placebo responsiveness.

### Healing and Placebo

The recognition of the mind-body connection and the potential for self-healing through the mind alone has been acknowledged since time immemorial, and it has been harnessed throughout history in religious and traditional medical practices. In ancient times, most illnesses and diseases were considered a consequence of sin; a punishment for disobedience. In order to holistically heal an individual, priests and gurus served the function of doctors as well as spiritual guides. The improvement seen in the patient was attributed to the supposed medicinal properties of the treatments (many of which are not backed by science) or the intervention of God, who was invoked through the 'rituals'. The assignment of meaning to these practices induces what can be considered a classical demonstration of the placebo effect [12].

These practices fall in line with our current understanding of the factors that influence placebo responses; A respected, competent, trustworthy practitioner [11], an individual who believes the treatment can be effective, the right environment [13], and a medium that was expected to heal [9] was almost always present in these practices. Various mediums have been utilised throughout history, with water being one of the most notable and consistent ones.

### Water as A Medium of Faith-Based Healing

Two essential elements help transform ordinary water into "holy water". Those are (1) the belief that one can be healed by the water, in other words, the believer's experience of healing, and (2) the teaching issued by the group leadership believed to be the properties of "holy water".

The belief that water has the capacity to heal has been studied by various scientists throughout history. Masaru Emoto spent decades of his life researching water, water molecules and water memory. In his book "The Hidden Messages of Water", Emoto claims that "Water has the ability to copy and memorise information" [14]. He argued that due to this, our prayers and thoughts affect the water we consume. While other studies have attempted to replicate these findings unsuccessfully, it has not prevented him from amassing followers with anecdotal experiences.

Water as a medium of healing in religious spheres is not uncommon. Iranian prayer healing often involves providing a mixture of water and sugar that has been prayed upon to those who seek it [15]. The Cherokee practice of 'going to water' with the medicine man

to heal [16] involves similar principles. In Rural Gujarat, people seek traditional healers who provide them with holy water among other forms of treatment for mental illnesses [17]. According to the official website of Lourdes Sanctuary, there have been over 7,000 reported cases of healing at Lourdes since the apparitions and 70 cases have been considered miraculous by the Church, out of which 80% were women (*Les miracles de Lourdes*, 2022). A recent study with 37 females concluded that the use of placebos within the framework of religious beliefs and practices could alter the experience of emotional salience and cognitive control, and connectivity changes in the associated brain networks often accompany this change. The participants reported increased intensity of pleasant bodily sensations (e.g., feelings of warmth, tingling) and feelings (e.g., gratefulness) after the session for the "Lourdes water" condition. The influence of religious beliefs and prayers has not been researched adequately, especially in the Islamic context, with most papers in this domain investigating the impact of expectations when water is perceived to be combined with other substances. Researchers [18] created a fictional product called AquaCharge Energy Water, and claimed it had been infused with 200mg of caffeine to enhance performance and energy, while in reality, it was just regular bottled water. Preliminary results from their study showed that participants who consumed regular bottled water under the belief that it was caffeinated reported feeling significantly more alert than before consumption, accompanied by an increase in blood pressure. However, when it was explicitly stated that the product was not working, both the subjective and physiological responses were eliminated.

### Infusion of Prayer and Water for Healing Among Muslims

In Islamic tradition, the verses of the Holy Quran provide the recipient with therapeutic benefits and are often used to heal various ailments. The verses are recited directly over the person, but may also be recited on objects such as amulets, talismans, artefacts [19] and even water. People report healing various illnesses, ranging from the common cold to chronic diseases that did not respond to science-backed medicine [5,20]. While the common cold, among other illnesses, subsides after a few days regardless of the treatment, some healing responses are clearly an indication of either a miracle or the placebo effect at play.

Qur'anic intervention was found to have a significant positive impact on five different types of illnesses and health conditions, including stress, anxiety, depression, cancer, pain (including pain experienced during childbirth), heart disease; and even coma. The intervention effectively improved and alleviated these debilitating conditions [21]. These verses are often recited over water by sheikhs or imams (Islamic religious scholars) and given to the person in need.

### Purpose of Present Study

This practice was seemingly efficacious in many cultures, and while the healing was attributed to the supreme power associated with each faith, many religions claimed a similar benefit from their own practices and Holy waters around the world. Curiously, the benefits were almost always experienced if the verses were

congruent with the person's religious beliefs, i.e., Most Hindus did not benefit from water infused with Quranic verses, while most Muslims did not respond to water that was considered Holy by Hindus. This insinuated the possibility of the belief and expectation playing a greater role in the benefits observed than previously assumed by either community.

The objective of this study is to delve into the impact of the expectations within the realm of faith-based water healing, specifically among Muslim students enrolled at a university. The hypothesis posits that an expectation of prayer infusion will correlate with higher scores on the pleasant-unpleasant BMI (Brief Mood Introspection) scale, and lead to an enhanced mood. By examining the interplay between faith-based beliefs and perceived outcomes, this research contributes to the broader understanding of expectations and the placebo effect within religious contexts and its implications for subjective experiences of healing.

## Methodology

### Hypotheses

The study aims to test the following hypotheses:

- Students informed that the water is infused with prayer will report a statistically significant increase in emotional-wellbeing and mood scores post-intervention.
- Students informed that the water is infused with prayer will report a significantly more pleasant mood compared to the control group post-intervention.

### Sample

The inclusion criteria for this study required participants to be Muslim students aged 18 to 25, currently enrolled in a university. The selection process involved randomly choosing classes, within which Muslim students were invited to participate in the experiment, while non-Muslim students were exempted.

### Instrument

The Brief Mood Introspection Scale [22] assessed the participant's moods before and after the intervention. The Brief Mood Introspection Scale [22] is a self-report measure designed to assess individuals' momentary mood states across two dimensions: positive affect and negative affect. The BMIS has been used extensively in research across various fields, including psychology, social science, and neuroscience, and has been found to have good validity and reliability and also has been shown to have good internal consistency and test-retest reliability. This questionnaire was used to assess the mood of the participants before and after the intervention of placebo water. While the original questionnaire used a 4-point Meddis scale, a 7-point Likert scale was shown to be more reliable. The participants were asked to tick under (1) *Strongly Disagree* (2) *Disagree* (3) *Somewhat disagree* (4) *Neither Agree nor disagree* (5) *Somewhat Agree* (6) *Agree* (7) *Strongly Agree* in response to each item. Note that a higher score indicates a more pleasant mood.

### Design

A pre-test/post-test design was used to allow the researcher

to determine if there was a change in the dependent variable (Participants' mood) due to the independent variable (Expecting prayer-infused water) being studied. The classrooms were randomly categorized as control or experimental groups, and a total of 53 students participated. The Brief Mood scale was printed and distributed among them. After the first questionnaire, the participants in the experimental group were handed sheets with a list of prayers and verses that are associated with inducing positive emotions and were informed that the water made available to them was infused with the same. The control group was asked to drink the water and remain seated without further elaboration. A previous study recorded significant changes after 15 minutes of the intervention, which has been adopted in this study as well. After the 15-minute duration, the participants were required to fill in the questionnaires once again. Several questionnaires were excluded from the analysis as a consequence of incompleteness, lack of identifiers preventing the connection between pre- and post-scores, and non-compliance with the inclusion criteria. In total, 8 participant entries from the control group and 6 from the experimental group were excluded. As a result, the final dataset comprised responses from 19 participants in the control group and 20 participants in the experimental group.

## Results

SPSS was utilized to analyze the data. The data was rigorously assessed to ensure the differences in mood and emotional well-being can be attributed to the intervention directly.

### Moderation and Homogeneity of Data

#### Moderation of Data Distribution

Normality testing helps determine whether data follows a normal distribution, which is a prerequisite for many statistical tests. The Shapiro-Wilk test was used to evaluate the distribution of data and see if it follows a normal distribution. This test is particularly suitable for small and medium-sized samples, as shown by the results of the following table:

**Table 1:** Normality Testing.

Testing	Statistical	degree of freedom (df)	Probability value (Sig)
Shapiro-Wilk Test	0.967	38	0.327

It is clear from the previous table that Statistical significance value The value calculated by the Shapiro-Wilk test was 0.327, which is greater than the significance level of 0.05. Since the probability value is higher than 0.05, there is not enough statistical evidence to reject the null hypothesis, which indicates that the data follows a normal distribution.

#### Homogeneity of Variance Between the Two Groups

Checking the homogeneity of variance between groups is an essential step in many statistical analyses. Levene's Test was used to evaluate whether the variances in the results were homogeneous between two sets of data, as shown by the results of the following table:

**Table 2:** Homogeneity of variance.

Testing	Levene 's Statistic	Probability value (p-value )
Levene's test	1.81	0.187

It is clear from the previous table that The probability value (p-value) resulting from Levene's test is 0.187, which is greater than the traditional significance level of 0.05. Based on this result, we do not reject the null hypothesis, which assumes that the variance between the two groups is homogeneous. This indicates that the variance between the two groups does not differ significantly, which means that the basic condition for homogeneity of variance has been met.

### Adjust Variables Before Applying the Experiment Age Variable

In experimental studies, adjusting variables between the control and experimental groups is an essential step to ensure the accuracy of the results and control the influence of external factors. To ensure that there were no prior differences between the two groups before implementing the experiment, a t-test was used for independent samples. This test helps determine whether there are statistically significant differences in the age variable between the control and experimental groups in the pre- application, as its results appear in the following table.

It is clear from the previous table that the arithmetic mean for the age variable in the control group was (20.42), while the arithmetic mean for the experimental group was (20.65). The calculated T value was (0.36), which is not statistically significant at the significance level (0.05), which indicates the equality of the two groups before the start of the experimental application. This reinforces the hypothesis that the two study groups are homogeneous and start from a single starting point, ensuring that

any subsequent differences can be attributed to the effect of the experiment itself.

### Emotional Well-Being Variable

A t-test was used to determine whether there are statistically significant differences in the emotional well-being variable between the control and experimental groups pre-intervention.

The arithmetic mean for emotional well-being in the control group was (79.79), while the arithmetic mean in the experimental group was (79.45). The t-score was 0.10, which is not statistically significant at the significance level of 0.05.

### Hypothesis Testing

#### First Hypothesis

The first null hypothesis posits that "students who believe the water is infused with prayer will not report a significantly more pleasant mood than the control group." To assess this, the arithmetic means, standard deviations, and t-values were calculated using an Independent Samples T-Test.

The t-test revealed a statistically significant t-value of -3.23 ( $p < 0.05$ ) for the emotional well-being scale, indicating the experimental group outperformed the control group. Specifically, the experimental group had a higher mean score of 94.30 compared to the control group 78.79. These results indicate a statistically significant difference in favor of the experimental group, rejecting the null hypothesis at the 0.05 significance level.

The analysis yielded a statistically significant t-value of -7.62 ( $p < 0.05$ ), demonstrating an improvement in the experimental group's post-intervention scores. The mean score increased from 79.45 in the pre-test to 94.30 in the post-test. Thus, the results indicate

**Table 3:** Results of the t-test for two independent samples to detect differences in the pre-application between the control and experimental groups for the age variable.

Variables		Descriptive statistics			Test the differences in the means		
Variable	Group	Participants	Arithmetic Average	Standard Deviation	'T' score	Degrees of Freedom	Statistical significance value
Age	Control	19	20.42	1.895	0.36	37	0.718
	Experimental	20	20.65	2.033			

**Table 4:** Results of a t-test for two independent samples to detect differences in the pre-application between the control and experimental groups of the emotional well-being variable.

Variables		Descriptive statistics			Test the difference between the means		
Variable	Group	Participants	Arithmetic Average	Standard deviation	'T' value	Degrees of freedom	Statistical Significance value
Emotional well-being	Control	19	79.79	10.758	0.10	37	0.922
	Experimental	20	79.45	10.831			

**Table 5:** Comparison of average scores of the control and experimental groups on a measure of emotional well-being post-intervention.

Group	Descriptive statistics			Test the difference between the means		
	Participants	Arithmetic Average	Standard Deviation	'T' value	Degrees of freedom	Statistical significance value
Control	19	78.79	16.588	-3.23	37	0.003
Experimental	20	94.30	13.283			



**Table 6:** Paired Samples T-Test pre- and post- experimental group.

Application	Descriptive Statistics			Test the difference between the means		
	Participants	Arithmetic average	Standard deviation	'T' value	Degrees of freedom	Statistical Significance Value
Pre-Test	20	79.45	10.831	-7.62	19	0.000
Post-Test	20	94.30	13.283			

a significant difference in favour of the post-intervention scores, leading to a rejection of the null hypothesis at the 0.05 significance level.

### Second Hypothesis

The second null hypothesis suggests "Students informed that the water is infused with prayer will not report a significantly more pleasant mood compared to the control group post-intervention." To test this, a Paired Samples T-Test was conducted, comparing the pre- and post-intervention scores of the experimental group.

### Discussion

In the literature, the studies that have researched the use of prayer-infused water among Muslims have given us data regarding the frequency and nature of practices. It is consistently prevalent in Muslim societies, yet is undermined and dismissed by the scientific community. The current study aimed to explore the influence of expectations, and was designed under the same assumption.

While underestimating the influence of belief or expectations in positive changes or overestimating the water's ability to heal can lead to prolonging the pursuit of medical treatment for curable illnesses, this topic remains understudied. The positive results of this study indicate that researchers and faith-healers must account for the involvement of the placebo effect in water-based faith healing. Studies that explore the efficacy of religious treatments [23] must also recognize that individuals with expectations regarding the treatment are likely to experience results congruent with their beliefs. In interpreting the findings of the current study, it is imperative to recognize specific limitations that could affect the strength and applicability of the results. Given the sensitive nature of the study, individuals may be inclined to provide responses that align with societal expectations or perceptions, potentially leading to an overestimation of the perceived impact of the holy water. Furthermore, the study's relatively limited sample size, comprising 19 and 20 students in the control and experimental group respectively, necessitates careful consideration. While the insights gained within this cohort are valuable, caution is advised when extending these findings to larger, generalised populations.

The current study laid a foundation by examining the psychological impact of the belief in prayer-water infusion, future studies may benefit from incorporating a design where participants receive water that has undergone a genuine prayer-water infusion, allowing for a more direct evaluation of the potential effects of prayer on mood and psychological well-being. This approach would not only provide a more accurate representation of the influence of prayer but also help distinguish between the psychological impact of belief in infusion and the actual spiritual or religious practice itself. Future research may also explore the responses of diverse

religious groups when exposed to holy water from traditions that differ from their own. Furthermore, investigating whether prayer-infused water exhibits discernible effects on physical illnesses and pain could contribute to our understanding of the holistic impact of spiritual practices on both mental and physical well-being.

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### Authors contribution

Conceptualization: A.F., Q.H

Methodology: A.F., Q.H

Investigation: Q.H.

Data curation: A.F.

Writing – original Draft: A.F.

Writing –Review and Editing: A.F., Q.H

Project administration: A.F., Q.H

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### Conflicts of interest

The authors declare any conflict of interest pertaining to the topic addressed in the article.

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