The Invisible Shackles: Unveiling Superstitious Thinking Level among Postgraduate Diploma Students at Al al-Bayt University

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Abstract

The study aimed to reveal the level of superstitious thinking among postgraduate diploma students at the Faculty of Educational Sciences at Al al-Bayt University (AABU). A mixed-method approach was adopted to collect and evaluate both qualitative and quantitative data. The quantitative phase involved a convenient sample of 247 postgraduate diploma students. In the qualitative phase, 76 students were selected using the Snowball Sampling technique, and structured interviews were conducted with them. The results indicated that the level of superstitious thinking was low among the study sample. However, gender differences were observed, with female students' being more inclined to adopt superstitious thinking. The study recommended emphasizing the role of religious commitment and enhancing critical thinking skills in academic environments to combat superstitious thinking.

Keywords: Superstitious Thinking, Postgraduate Diploma Students, Al al-Bayt University.

القيود الخفية: الكشف عن مستوى التفكير الخرافي لدى طلبة الدبلوم العالي في جامعة آل البيت

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ملخص

هدفت الدراسة إلى الكشف عن مستوى انتشار التفكير الخرافي بين طلاب الدبلوم العالي في كلية العلوم التربوية بجامعة آل البيت. اعتمدت الدراسة منهجًا مختلطًا لجمع وتقييم بيانات نوعية وكمية. تضمنت المرحلة الكمية اختيار عينة متيسرة مكونة من 247 طالباً ببرنامج الدبلوم العالي. أما في المرحلة النوعية، فقد تم اختيار 76 طالبًا باستخدام أسلوب المعاينة المتسلسلة (Snowball Sampling)، وتم إجراء مقابلات مقننة معهم. أظهرت النتائج أن مستوى التفكير الخرافي كان منخفضًا لدى عينة الدراسة، إلا أن هناك فروقًا بين الجنسين، حيث كانت الإناث أكثر ميلاً لاعتناق التفكير الخرافي. أوصت الدراسة بالتركيز على أهمية الوازع الديني وتعزيز مهارات التفكير النقدي في البيئات الأكاديمية للتصدي للتفكير الخرافي.

الكلمات المفتاحية: التفكير الخرافي، طلبة الدبلوم العالي، جامعة آل البيت.

Introduction

Throughout history, humans have relied on various frameworks, myths, legends, and science to make sense of the world around them. While all aim to explain natural phenomena, they differ significantly in their foundations and methods. Science is a relatively recent development grounded in systematic observation and empirical testing. In contrast, myths- imaginative narratives used to explain events beyond conscious or scientific understanding- served as the dominant explanatory system across cultures for thousands of years (Arafah, 2019; Al-Zaghah, 2010). In the absence of an empirical knowledge, people often turned to emotion and fantasy to interpret their realities. This reliance on superstitious thinking has left a lasting legacy; even today, despite rapid scientific progress, superstitious thinking continues to shape social, economic, and educational aspects of modern societies (Zakaria, 1978).

According to Delacroix and Guillard (2008) and Salah (2019), superstitious thinking links events to aspects other than their real scientific causes. It is based

on denying science and rejecting its methods by relying on fallacious, unnatural, or metaphysical causes to solve any problem. Additionally, Al-Qudah (2013) defines it as primitive metaphysical thinking by which simple, vague, and ambiguous interpretations are applied to matters for which there is no tangible explanation, or as an attempt to control things in some way. It performs several functions such as interpreting strange phenomenon, fulfilling a need, bringing a benefit, and avoiding harm or danger.

Abdullah, Ahmed, and Abu Samra (2016) assert that it is a kind of thinking through which a person builds a perception of events that happen to them and the world around them in an illogical way, and in a manner that contradicts the principles of science and true religion. Nevertheless, the individual believes in its validity without considering its religious legitimacy or scientific accuracy.

To summarize, superstitious thinking refers to ideas or actions that are generally illogical and unsupported by evidence. It does not adhere to scientific norms, and it leads to unreasonable decisions or promotes biases and presumptions.

What Prompts Superstitious Thinking?

Numerous researchers have concluded that superstitious thinking is an attempt to comprehend and manage fear as it reduces anxiety in uncertain and stressful situations by giving one a sense of secondary control, even when it has no impact on actual outcomes (Crossman, 2024; Hoffmann et al., 2022; Keinan, 2002).

According to Skinner (1948), superstitious thinking is a type of unintended behavior that occurs as a result of associating a certain favorable outcome with the behavior, increasing the likelihood of repeating it even when no such connection exists. He unwittingly discovered the process of reinforcement when an issue with the automated food system for pigeons in his laboratory caused food to be dispensed irregularly (Abu Allam et al., 2015; Barnfield, 2021).

In the 1960s, Wason demonstrated how people tend to seek out and favor information that confirms their existing beliefs, a cognitive distortion he termed confirmation bias. This bias leads individuals to ignore or dismiss contradictory

evidence and contributes to the adaptation of superstitious thinking by reinforcing perceived patterns and expectations. It is typically unconscious and becomes stronger when the topic is emotionally significant or personally relevant. Confirmation bias affects how individuals gather, interpret, and recall information, shaping their way of thinking that may persist despite a lack of objective support (Casad & Luebering, 2023; Cherry, 2022; Nickerson, 1998; Wason, 1960).

In 2011, Kahneman & Krämer developed a comprehensive theory of how individuals adopt superstitious thinking. This illuminates how it is constructed and leads to irrational decision-making. He explained that to take a decision, our brain interfaces between two systems (Systems 1 & 2) which complement each other and operate collectively to provide more effective and efficient decision-making, heuristics, shortcuts, and bias. System (1) is emotion-based and is quick and automatic, whereas System (2) is intellect-based as it is laborious and always attentive and reliable (Kahneman & Krämer, 2011; Gawronski and Creighton, 2013; O'Brien 2012; Smith, 2019). Thus, when we are confronted with emotionally charged information, our superstitious thinking increases. As a result, we tend to reject known truths arbitrarily and pay attention to the information that has the biggest affective impact and can be recalled most readily (Vyse, 2000).

Risen (2016) offered an alternative explanation as to why humans are prompted to superstitious thinking. According to Risen, humans frequently "blow" or give in to System (1) even when they know it is wrong because they expect false claims to be corrected as soon as they are detected. Sometimes the problem is not that they lack the expertise to recognize superstitious notions, but rather that they fail to correct them, which leads to an increase in superstitious thinking (See Figure 1).

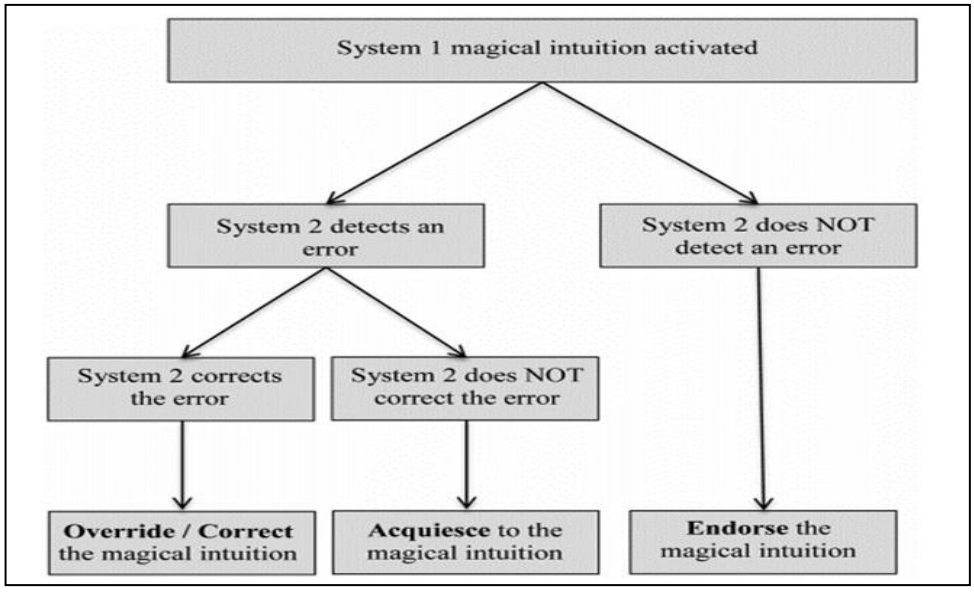

Figure 1 : Risen's figure of the dual-system theory

In conclusion, the previous mechanisms, namely anxiety coping, incidental conditioning, cognitive biases, and the conflict between System 1 and System 2 thinking, reflect fundamental human attempts to navigate uncertainty and seek predictability. Understanding these mechanisms can ultimately contribute to reduce superstitious thinking.

Determinants Influencing the Prevalence of Superstitious Thinking

Although superstition and science are fundamentally opposed, superstition often fills the explanatory gaps left by science, especially in areas where empirical understanding is limited. This interplay persists despite scientific advancement, as some phenomena remain unexplained (Casad & Luebering, 2023; Saleh, 1979).

However, education can reduce superstitious thinking by creating scientifically literate individuals more likely to discard them (Olorundare 1998). Numerous researchers (e.g., Dissa et al., 2017; Chakraborty, 2017; Orenstein, 2002) have studied participants from many educational backgrounds, and all have confirmed

that more educated people tend less to superstitious thinking. Otis and Alcock (1982), Assaf & Zaidan (2007), and Al-Qudah (2013) demonstrated that university students exhibit less superstitious thinking than individuals with lower educational attainment, likely due to their enhanced critical thinking skills. Moreover, a study conducted by Tosyali and Aktas (2021) supported the assumption made by Aarnio and Lindeman (2005) that individuals inclined toward analytical or critical thinking will be less superstitious.

Additionally, Religion helps correct misconceptions and promotes rational thinking (Al-Qaisi, 2021; Zawistowska et al., 2025). It also encourages taking personal responsibility rather than relying on superstitious thinking (Dissa et al., 2017). However, studies by Stanke (2004) and Torgler (2007) found no clear link between religiosity and superstitious thinking, suggesting a generally negative or neutral relationship.

Several other variables have also been found to be associated with superstitious thinking. For instance, Khan and Mohiuddin (2020) found that urban students are more superstitious than rural students. In another study, Mundada (2013) reported that rural students are more likely to have superstitious thinking than urban students, although Mundada's (2013) results revealed that the majority were classified as non-superstitious on the superstition scale. Additionally, Attallah (2017) reported several significant findings, including the fact that superstitious thinking has grave negative consequences for both individuals and the Arab community as a whole. Numerous superstitions persist in contemporary Arab mindset, particularly among the less educated, women, villagers, and the elderly. Moreover, ignorance, imitation, and fear of the unknown can contribute to the spread of superstitious thinking.

Tamilselvi and Sindhu (2016) indicated that superstitious thinking is not significantly associated with gender or academic specialization. However, female teachers recorded higher average scores in superstitious thinking compared to their male counterparts. Moreover, both Kalita (2016) and Naaz (2019) concluded that neither gender nor academic level affects superstitious thinking among university students. Furthermore, no clear differences were observed based on academic specialization.

In contrast to these findings, Gray and Mill (1990) and Al Qudah (2013) argued that students in the arts and humanities are more inclined toward superstitious thinking, as they tend to lack analytical reasoning behind their actions. Conversely, Ghanem and Abu Awad (2010) found no statistically significant differences in superstitious thinking among students based on gender, high school specialization, academic achievement level, or parental education.

From the above, the researcher concludes that the prevalence of superstitious thinking is strongly associated with poor education and weak critical thinking and logic. Studies have shown that it varies according to gender, place of residence, bachelor specialization, individual and parental level of education, and age.

Study Significance, Research Problem, Objectives, and Questions

This study is significant for several reasons. One important aspect is that superstitious thinking and practices are prevalent in many societies and can have a significant impact on the lives of individuals. Understanding the prevalence of superstitious thinking among postgraduate diploma students is important, as this group represents the next generation of leaders and professionals. Moreover, identifying the causes of superstitious thinking can help in developing interventions to promote rational thinking. Additionally, this study has the potential to enhance awareness of the current state of superstitious thinking in academic and professional contexts, as well as to shed light on the elements that may contribute to combating superstitious thinking, if present, among postgraduate diploma students.

The researcher identified a gap in the literature and previous studies (e.g., Al-Qudah, 2013; Al Rabee, 2014; Abdul-Rahim, 2020; Ghanem and Abu Awad, 2010; Naaz, 2019) related to a scarcity of studies on superstitious thinking among postgraduate diploma students in faculties of educational sciences. Therefore, this study sought to gain a deeper understanding of the prevalence of superstitious thinking and identify potential approaches to combat its prevalence among postgraduate diploma students by answering the following research questions:

1. What is the prevalence of superstitious thinking among postgraduate diploma

students in the College of Educational Sciences?

2. Is there a difference in the prevalence of superstitious thinking among postgraduate diploma students according to gender, bachelor specialization (human, scientific), and place of residence (city, countryside, and Badia)?
3. What do postgraduate diploma students believe are the main reasons behind the observed level of superstitious thinking revealed in the quantitative findings?
4. What approaches do postgraduate diploma students believe can be implemented to combat superstitious thinking?

Research Methodology

Research Design

An explanatory sequential design was employed, in which quantitative data were collected and analyzed, and supplemented by qualitative data analysis. The results were then combined and are presented in the analysis section. This approach provides a deeper understanding of the fundamental research problem than if each aspect had been considered separately (Dhanapati, 2016).

First Phase: The Quantitative Sample

Participants

The participants were all postgraduate diploma students (n = 467) undertaking a postgraduate diploma program at Al al-Bayt University in 2022–2023. 247 students were conveniently sampled, 65 males and 182 females, representing 52% of the population. Of these, 108 live in a city, 109 live in the countryside, and 30 live in Badia. In terms of qualifications, 173 students hold BSc degrees in humanities, and 74 hold BSc degrees in sciences. See Table 1.

Table 1

Frequencies and Percentages of Variables (n = 247)

Variable	Category	Frequency	Percentage
Gender	Male	65	26.3
	Female	182	73.7
	Total	247	100.0
Place of residence	City	108	43.7

Variable	Category	Frequency	Percentage
	Village	109	44.1
	Badia	30	12.1
	Total	247	100.0
BSc specialization	Human	173	70.0
	Scientific	74	30.0
	Total	247	100.0

Data Collection

Research procedures and tools were designed after reviewing literature by Assaf & Zaidan (2007), Lilienfeld et al. (2010), Al Rabee (2014), Al-Qudah (2013), and Attallah (2017). To answer the first and second research questions, the researcher designed a questionnaire in which participants responded to items on a three-point scale ranging from 2 (I highly believe it) to 0 (I don't believe it at all). The tool was divided into two sections. The first elicited information on the three demographic characteristics: gender, place of residence, and bachelor specialization. The second section contained items aimed at evaluating the prevalence of superstitious thinking.

Initially, the tool consisted of 50 items. The researcher tried to ensure that the questionnaire's items were pertinent to the target sample's culture to guarantee the collection of relevant data within the desired context. To ensure face validity, it was presented to a jury of five educational professors. They suggested reducing the number of items to 35, depending on their suitability for the environment and culture of the sample. The percentage of agreement among the jury (92%) confirmed that the tool had a high degree of validity. Additionally, the researcher conducted the Kaiser Meyer-Olkin (KMO) test of sampling adequacy and Bartlett's test of sphericity, as shown in Table 2.

Table 2

KMO and Bartlett's Test of Sampling Adequacy

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.647
Bartlett's Test of Sphericity	**Approx. Chi-Square**	1122
	Df	595
	Sig.	.000

Table 2 shows that the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy produced a value of 0.647, which, although relatively modest, exceeds the minimum acceptable threshold of 0.60. This suggests that the data are suitable for factor analysis. Bartlett's Test of Sphericity yielded a statistically significant value of 1122 ($p < 0.001$), further confirming the appropriateness of the data for this analysis (Kaiser & Rice, 1974; Hair et al., 2009).

Exploratory factor analysis was also conducted using the Correlation Matrix method to uncover the underlying structure of the items without imposing a predefined factor model. The analysis revealed that all items were saturated under a single latent factor-"superstitious thinking"-with no need for a rotated component matrix, as no additional factors emerged. This unidimensional structure was supported by satisfactory item loadings (all > 0.40), and the internal consistency of the instrument was confirmed with a Cronbach's Alpha coefficient of 0.87, indicating high reliability. See Table 3.

Table 3

Total variance explained

Component	**Initial Eigenvalues**			**Extraction Sums of Squared Loadings**		
	Total	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**
1	3.901	11.145	11.145	3.901	11.145	11.145
2	1.765	5.043	16.188			
3	1.734	4.953	21.141			
4	1.516	4.331	25.471			
5	1.482	4.233	29.705			

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
6	1.424	4.070	33.774			
7	1.299	3.712	37.486			
8	1.271	3.631	41.117			
9	1.213	3.465	44.582			
10	1.139	3.254	47.836			
11	1.125	3.213	51.049			
12	1.092	3.119	54.168			
13	1.047	2.990	57.158			
14	.993	2.836	59.994			
15	.980	2.799	62.793			
16	.929	2.655	65.447			
17	.914	2.611	68.058			
18	.887	2.536	70.593			
19	.840	2.401	72.995			
20	.829	2.369	75.363			
21	.786	2.245	77.609			
22	.774	2.212	79.821			
23	.747	2.136	81.956			
24	.687	1.963	83.920			
25	.676	1.932	85.852			
26	.648	1.851	87.703			
27	.605	1.728	89.431			
28	.593	1.695	91.126			
29	.562	1.606	92.732			
30	.528	1.509	94.241			
31	.497	1.420	95.661			
32	.452	1.293	96.954			
33	.408	1.165	98.119			
34	.389	1.112	99.231			
35	.269	.769	100.000			
Extraction Method: Principal Component Analysis.						

The researcher also used the Scree plot method to confirm the results of the Eigenvalues analysis and ensure that all the factors extracted from the analysis were accurate, as shown in Figure 2.

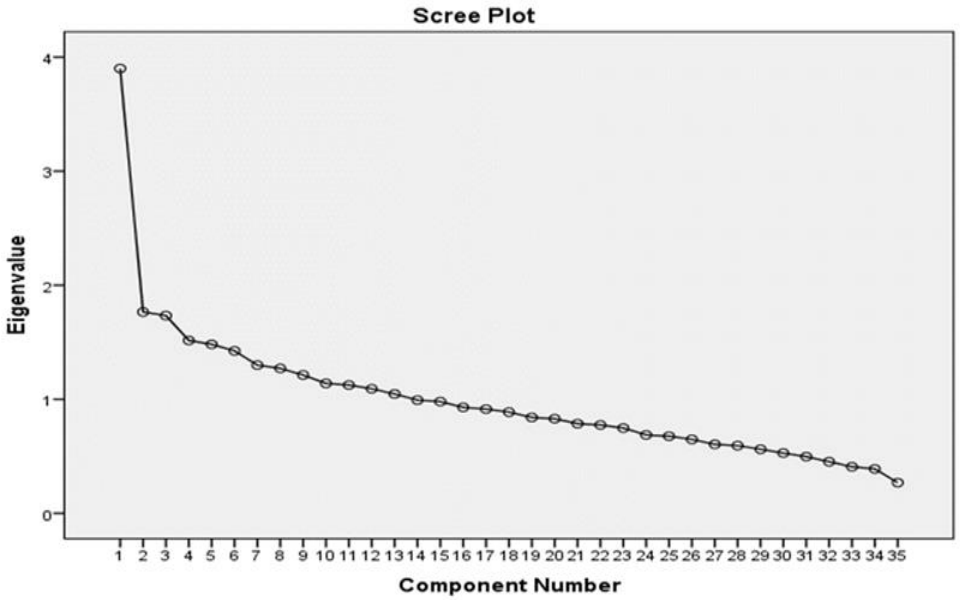

Figure 2. The values of the latent roots for each factor

As depicted in Figure 2, only one factor had a latent root greater than 1.8. Therefore, one latent factor was extracted using a saturation coefficient of 1, which was "the superstitious thinking of postgraduate diploma students at the College of Educational Sciences," as the matrix of other factors did not appear after rotation.

Reliability of the Tool

A test-retest approach with a 23-day interval was conducted with 40 postgraduate-diploma students to assess the internal consistency of the tool, who were later excluded from the sample. According to the analysis, the value of Cronbach's Alpha was 0.87, indicating a very high degree of internal consistency.

<u>Second Phase:</u> The Qualitative Sample

Participants

The second sample consisted of 76 postgraduate diploma students from the College of Educational Sciences, including 52 females and 24 males, all in-service teachers enrolled in the postgraduate diploma in educational administration program during the second semester of 2022–2023. Due to difficulties in reaching this dispersed population, snowball sampling was used, starting with purposefully selected participants who referred peers meeting the study's criteria. While this method may introduce sampling bias, efforts were made to ensure diversity in gender, teaching experience, and institutional background.

Data collection

To answer the third and fourth research questions, the researcher designed a structured interview guide. In response to the comments of a group of four educational specialists from AABU's College of Educational Sciences, the initial form was amended to the final design consisting of two questions (see Appendix B). Once the interviewees had agreed to take part, the interviews were scheduled. They were informed of the purpose of the interview and assured of the confidentiality and anonymity of their responses in interviews. Participants reviewed and signed their interview transcripts post-interview to verify accuracy and support data credibility.

The interview excerpts were examined and categorized in terms of frequencies and percentages. It is important to note that several comments were included in the presentation of the results during the qualitative data analysis.

The Reliability of the Interviews

To ensure the reliability of the interviews, the researcher followed several procedures. A standardized structured interview form was used, and all interviews were conducted under similar conditions to maintain consistency. A detailed interview protocol was developed to guide the wording and sequence of questions, as well as the criteria for evaluating responses, ensuring uniformity across participants. During the interviews, meticulous written notes were taken to

document responses accurately and allow for later comparison and validation. The collected data were thematically analyzed, with responses coded, grouped into main themes, and presented using frequencies and percentages.

Survey Results

First Research Question

Table 4 presents the means and standard deviations of 35 items addressing the first research question: *What is the prevalence of superstitious thinking among postgraduate diploma students in the College of Educational Sciences?*

Table 4

Descriptive Statistics of Participants' Superstitious Thinking Levels (n = 247)

#	Items	Means	SD	Rank	Superstitious thinking level
4	I believe that alcohol damages brain cells.	1.85	0.42	1	low
6	I believe that reading in dim light is harmful to the eyes.	1.67	0.59	2	low
15	I believe that human memory works like a recording device and a video camera and accurately records the events we have lived through.	1.56	0.58	3	low
27	I believe that depression rates increase among postpartum women.	1.54	0.64	4	low
18	As a rule of thumb, if I am uncertain about my answer in the exam, I stick to the first answer that comes to mind	1.54	0.64	4	low
32	I believe adoption has a psychological impact on a child's psyche.	1.45	0.63	6	low
34	Following a head injury, the best prescription is relief.	1.43	0.78	7	low
24	I believe that a high level of anger in a marriage predicts divorce.	1.38	0.66	8	low
30	I believe that deaf people can understand most of what other people say by lip-reading.	1.38	0.62	8	low
10	I believe that babies relate only to their	1.37	0.71	10	low

#	Items	Means	SD	Rank	Superstitious thinking level
	mothers.				
8	I believe that exposing a pregnant mother to a bad mood may lead to a miscarriage.	1.30	0.71	11	low
9	I believe that married life satisfaction increases after having children.	1.30	0.70	11	low
25	I believe that poverty and low education are major causes of terrorism.	1.26	0.80	13	low
2	There is no doubt that the sixth sense is a scientifically proven and recognized phenomenon.	1.26	0.69	13	low
17	I believe that people who cannot remember what they ate have impaired short-term memory.	1.21	0.74	15	low
1	I believe that some people are left-brained and others are right-brained.	1.21	0.74	15	low
21	I believe that thinking positively prevents cancer.	1.16	0.77	17	low
35	I believe most people only use 10% of their brainpower.	1.16	0.76	17	low
3	I believe that coma is a state of deep sleep.	1.14	0.79	19	low
23	I believe that intense fear turns hair white.	1.14	0.77	19	low
11	I believe that diabetes makes children hyperactive.	1.13	0.76	21	low
14	I believe that most people go through a midlife crisis in their forties and early fifties.	1.13	0.73	21	low
20	I believe our happiness depends on our external circumstances.	1.04	0.78	23	low
12	I believe that lying is non-existent in children aged 3-5.	0.91	0.76	24	low

#	Items	Means	SD	Rank	Superstitious thinking level
16	I believe that hypnosis can help restore memories of forgotten events.	0.89	0.73	25	low
29	I believe that punishment is an effective way to change behavior in the long term.	0.88	0.71	26	low
19	I believe that most of the children who have been subjected to sexual abuse turn into sexual offenders when they grow up.	0.85	0.67	27	low
31	I believe that a lie detector test is an accurate way to check for deception.	0.83	0.73	28	low
33	I believe that people with color blindness see the world in black and white.	0.73	0.81	29	low
7	I believe that when babies listen to Mozart's music, it enhances their intelligence.	0.60	0.76	30	low
5	I tend to believe that alcohol enhances sexual desire.	0.57	0.72	31	low
22	I believe that people are sad at the beginning of each week.	0.55	0.74	32	low
26	I believe suicide occurs without warning (suddenly).	0.51	0.70	33	low
28	I believe that intelligent people are physically weak.	0.48	0.64	34	low
13	I believe that all genius traits disappear when a person reaches adulthood.	0.31	0.55	35	low
Total degree		1.85	0.42		low

Table 4 reveals that the degree of prevalence of superstitious thinking among postgraduate diploma students at the College of Educational Sciences was low, and the following paragraphs: "I believe that alcohol destroys brain cells"; "I believe that reading in dim light harms the eyes"; "I believe that human memory works like a recording device and a video camera accurately recording the events we experience; "I believe that depression rates increase among women in the

postpartum period" had the highest averages of 1.85, 1.67, 1.56, and 1.54, respectively.

Second research question

Table 5 presents the results concerning the second research question: *Is there a difference in the prevalence of superstitious thinking among postgraduate diploma students according to gender, bachelor specialization (human, scientific), and place of residence (city, countryside, and Badia)?* The researcher conducted a three-way ANOVA test to identify the source of variance in the variables; the results of which are as follows.

Table 5

Three-way ANOVA Test to Examine The Source of Variance in Gender, BSc Specialization & Place of Residence

Source	Sum of squares	DF	M.S	"F" value	Sig
Gender	.213	1	.213	4.065	.045
Place of residence	.114	2	.057	1.086	.339
Academic specialization	.002	1	.002	.042	.838
Error	12.673	242	.052		
Corrected Total	13.035	246			

Table 5 reveals that:

- Concerning gender, there are statistically significant differences in "superstitious thinking prevalence among postgraduate diploma students" (F = 4.065) in favor of females.
- Concerning place of residence, there are no statistically significant differences in "superstitious thinking prevalence among postgraduate diploma students" (F = 1.086).
- Concerning bachelor's specialization, there are no statistically significant differences in "superstitious thinking prevalence among postgraduate diploma students" (F = .042).

After the quantitative analysis identified low superstition levels and gender differences, the next phase was the qualitative phase, which was designed to explore participants' perspectives on factors reducing superstitious thinking. The insights from interviews provided contextual explanations supporting the statistical trends.

Interviews Results

This section presents the answers to both the third and fourth research questions: *'What do postgraduate diploma students believe are the main reasons behind the observed level of superstitious thinking revealed in the quantitative findings?'*, and '*What approaches do postgraduate diploma students believe can be implemented to combat superstitious thinking?'*

The results of the first research question indicated a low level of superstitious thinking among postgraduate diploma students. Accordingly, the researcher analyzed the qualitative data using frequencies and percentages, focusing on the third and fourth research questions. Part 1 presents the determinants that may explain the low levels observed in the quantitative phase, while Part 2 outlines the approaches proposed by interviewees to sustain this low prevalence.

Part 1: Determinants of the Low Prevalence of Superstitious Thinking Among Postgraduate Diploma Students

To answer the third research question: "*What do postgraduate diploma students believe are the main reasons behind the observed level of superstitious thinking revealed in the quantitative findings?"* frequencies and percentages were calculated as follows:

Out of the 76 interviewees, 96% provided responses that could be classified under four main reasons for the low prevalence of superstitious thinking among postgraduate diploma students, as presented in Table 6. The remaining 4% did not offer responses that could be clearly categorized under the identified thematic classifications.

Table 6

Frequencies and Percentages of The Determinants of The Low Prevalence of Superstitious Thinking

#	Determinant	Frequency	Percentage
1.	Education and critical thinking skills	30	39%
2.	The power of strong religious faith	20	26%
3.	A high level of individual maturity and awareness	12	16%
4.	The individuals' social environment and the degree to which they adhere to customs and traditions	11	14%
	Total	73	96%

Table 6 reveals that:

- Thirty students (39%) reported that higher levels of education and good critical thinking skills are potential reasons for the low prevalence of superstitious thinking. This means those students who have more education and stronger critical thinking skills are less likely to believe in superstitions:

{.....} A lack of education tends to lead to superstitious thinking.

{.....} For my part, I believe that logic and scientific thinking are reasons for rejecting superstition and finding more logical explanations for the world we live in.

{.....} A person's awareness expands as they learn more.

- Twenty students (26%) believed that a strong religious faith is responsible for the low levels of superstition among postgraduate diploma students, as it may serve as a buffer against superstitious thinking.

{.....} Superstitious thinking doesn't take over your mind when you're closer to God!

{.....} I think many heaven-sent manuscripts consider superstitious thinking to be invalid.

- Twelve students (16%) thought that a high level of individual awareness could reduce the prevalence of superstition among postgraduate diploma students. This indicates that individuals who are more aware may be more rational and less likely to believe in superstitious ideas or practices.

{.....}. In my opinion, as human awareness increases, he'll think more logically.

{.....} I think we're the digital generation, and we're capable of getting rid of superstitious thinking i*nherited from parents and grandparents.*

- According to 11 students (14%), an individual's social environment and a lack of adherence to customs and traditions could prevent superstition. This suggests that social and cultural factors may play a role in shaping an individual's beliefs and attitudes toward superstition.

{.....} The superstitious thinking of parents and grandparents is taken for granted, but when educators reject these ideas, they prevent their dissemination and transmission to the next generation.

{.....} I think we're the digital generation, capable of eliminating superstitious thinking inherited from parents and grandparents.

Part 2: Approaches to Combating the Prevalence of Superstitious Thinking

To answer the fourth research question: *"What approaches do postgraduate diploma students believe can be implemented to combat superstitious thinking?"* frequencies and percentages were calculated as follows:

Of the 76 interviewees, 94% provided responses that identified two main approaches to combat superstitious thinking among postgraduate diploma students. The remaining 6% did not offer responses that could be categorized under the major thematic classifications presented in Table 7.

Table 7

Frequencies and Percentages of Approaches to Combating Superstitious Thinking

#	Method	Frequency	Percentage
1	Focusing on conscious, organized thinking governed by logic and reason will inevitably lead to many truths and overcome problems.	61	80%
2	The power of religious faith stimulates logical thinking, which will reject superstitious thinking.	11	14%
Total		72	94%

Table 7 reveals that:

- Sixty-one students (80%) reported that conscious critical thinking governed by logic and reason will inevitably lead to many truths and overcome problems, and hence gradually combat superstitious thinking.

{.....} Individuals who use scientific thinking can analyze any situation and interpret it logically.

- According to 11 students (14%), the power of religious faith can stimulate logical and critical thinking, which will reject superstitious thinking.

{.....} Adherence to religion encourages individuals to renounce superstitious thinking.

Discussion

The results indicate that superstitious thinking among postgraduate diploma students at the College of Educational Sciences is generally low. This suggests that students, many of whom are teachers, value evidence-based practice and tend to make decisions through reasoning rather than superstitious thinking. It also reflects an academic environment that promotes critical thinking about irrational claims, or possibly suggests that those pursuing postgraduate education already possess more rational, evidence-based ways of thinking and understanding the world (Aarnio & Lindeman, 2005; Al-Qudah, 2013; Attallah, 2017; Chakraborty, 2017; Dissa et al., 2017; Otis & Alcock, 1982; Tosyali & Aktas, 2021). However, Naaz (2019) found that over half of postgraduate students showed moderate levels of superstitious thinking, indicating some inconsistency across contexts.

Research has also identified a statistically significant gender difference in superstitious thinking, with females generally exhibiting higher levels of it. This trend may be attributed to females' stronger reliance on intuition (Attallah, 2017; Savin, 2020; Tamilselvi & Sindhu, 2016; Ward & King, 2020). Other studies present opposing findings, reporting no notable gender-based differences (Ghanem & Abu Awad, 2010; Mundada, 2013; Vijay et al., 2017). Meanwhile, no significant differences in superstitious thinking have been found concerning

students' place of residence or field of academic specialization. Nonetheless, prior studies have produced mixed results in this regard (Al-Qudah, 2013; Khan & Mohiuddin, 2020; Gray & Mill, 1990).

Superstitious thinking tends to be lower among postgraduate diploma students, likely due to adopting scientific reasoning and critical analysis (Otis & Alcock, 1982; Tosyali & Aktas, 2021). Religious faith may also support rational thinking and reduce superstitious thinking, which aligns with (Al-Qaisi, 2021; Dissa et al., 2017; Zawistowska et al., 2025), though some studies report no clear link (Stanke, 2004; Torgler, 2007). Postgraduate diploma students also tend to rely more on slow, deliberate thinking -Kahneman and Krämer (2011) call "System 2"- which helps them question irrational ideas. This result is consistent with the findings of (Gawronski & Creighton, 2013; Risen, 2016; Smith, 2019). In addition, academic training encourages students to evaluate claims or practices that lack empirical evidence critically.

To reduce superstitious thinking further, two approaches are suggested: encouraging organized, logical thinking and reinforcing the rational foundations of religious belief among students. When science and faith are aligned in their pursuit of truth, both can support critical thinking and combat superstitious thinking.

These findings were made possible through the integration of quantitative and qualitative data, which provided a comprehensive understanding of the phenomenon under investigation. The quantitative phase offered a macro-level view of superstitious thinking prevalence, while the qualitative interviews contextualized these results by identifying the perceived mechanisms behind the patterns. This layered approach enriches the interpretation and enhances the credibility of the findings.

Conclusion

This study reveals that while superstitious thinking among postgraduate diploma students in educational sciences is generally low, targeted efforts are needed to sustain and further reduce its influence. Higher education institutions should implement structured interventions within teacher training programs to translate

these findings into practical impact. These include integrating dedicated courses on scientific reasoning, cognitive biases, and critical thinking, as well as designing interdisciplinary modules that examine superstition through psychological, sociocultural, and religious lenses. Faculty should be trained to foster analytical discourse and challenge pseudoscientific claims sensitively, while students should engage in reflection-based assessments and simulation activities that connect belief systems to educational practice. Capstone projects and community outreach, such as campaigns or workshops, can empower future educators to confront superstition in real-world contexts. At the policy level, educational authorities should incorporate critical thinking standards into national curricula and audit existing content for pseudoscientific elements. These strategies offer a comprehensive framework for producing educators equipped to promote evidence-based thinking and reduce the prevalence of superstitious thinking.

Limitations

This study has several limitations. While practical, the use of snowball sampling in the qualitative phase may have introduced bias and limited diversity, affecting generalizability. Additionally, conducting the study within Jordan's unique cultural context enhances its richness but may limit its global applicability. Cross-cultural studies are recommended to validate the findings.

Disclosure Statement

The researcher reported no potential conflict of interest.

Ethics Statements

When participants read and agreed to answer the questionnaire and participate in the interviews, they were giving their consent to be part of the research. All participants were reassured that their responses would be kept confidential.

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researcher declares that the final output was reviewed and edited as needed and takes full responsibility for the content of the published article.

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Appendix (A)
Questionnaire - Final Form

Dear Respondent:

This survey aims to reveal the superstitious thinking prevalence among students in postgraduate diploma programs who work as teachers at Jordanian schools. Please assist by completing this survey; the researcher appreciates you taking the time to complete it. Do not write your name on this questionnaire. If there are items you do not feel comfortable answering, please skip them. Your responses are voluntary, confidential, and cannot be identified by other individuals. Thank you for your cooperation. Your assistance is highly appreciated.

1 Demographic Questions:

Q1 Gender: A) Male B) Female
Q2 Bachelor specialization: A) Humanities, B) Science.
Q3 Place of residence: A) City B) Countryside C) Badia

2- Questionnaire items:

#	Item	Degree of belief		
		I highly believe it	**I moderately believe it**	**I don't believe it at all**
1.	I believe that some people use the left side and others use the right side of the brain.			
2.	There is no doubt that the sixth sense is a scientifically proven and recognized phenomenon.			
3.	I believe that coma is a state of deep sleep.			
4.	I believe that alcohol damages brain cells.			
5.	I tend to believe that alcohol enhances sexual desire.			
6.	I believe that reading in dim light is harmful to the eyes.			
7.	I believe that when babies listen to Mozart's music, it enhances their intelligence.			
8.	I believe that exposing a pregnant mother to a bad mood may lead to a miscarriage.			
9.	I believe that married life satisfaction increases after having children.			
10.	I believe that babies relate only to their mothers.			
11.	I believe that diabetes makes children hyperactive.			
12.	I believe that lying is non-existent in children aged 3-5.			
13.	I believe that all genius traits disappear when a person reaches adulthood.			
14.	I believe that most people go through a midlife crisis in their forties and early fifties.			
15.	I believe that human memory works like a recording device and a video camera and accurately records the events that we have lived through.			
16.	I believe that hypnosis can help restore memories of forgotten events.			
17.	I believe that people who cannot remember what they ate have impaired short-term memory.			

#	Item	Degree of belief		
		I highly believe it	**I moderately believe it**	**I don't believe it at all**
18.	As a rule of thumb, if I am uncertain about my answer in the exam, I stick to the first answer that comes to mind.			
19.	I believe that most of the children who have been subjected to sexual abuse turn into sexual offenders when they grow up.			
20.	I believe our happiness depends on our external circumstances.			
21.	I believe that thinking positively prevents cancer.			
22.	I believe that people are sad at the beginning of each week.			
23.	I believe that intense fear turns hair white.			
24.	I believe that a high level of anger in a marriage predicts divorce.			
25.	I believe that poverty and low education are major causes of terrorism.			
26.	I believe suicide occurs without warning (suddenly).			
27.	I believe that depression rates increase among postpartum women.			
28.	I believe that intelligent people are physically weak.			
29.	I believe that punishment is an effective way to change behavior in the long term.			
30.	I believe that deaf people can understand most of what other people say by lip-reading.			
31.	I believe that a lie detector test is an accurate way to check for deception.			
32.	I believe adoption has a psychological impact on a child's psyche.			
33.	I believe that people with color blindness see the world in black and white.			
34.	Following a head injury, the best prescription is relief.			
35.	I believe most people only use 10% of their brainpower.			

Appendix (B)
Structured Interview Form

1- Interviewee information:

Name:	
Profession:	
Gender:	

The interview started at: (...) ended at: (...)

2- Interview questions:

#	Question	Response	Notes
1	Can you enumerate the reasons behind the weakness of drawing on superstitious thinking among educated people who have university academic degrees?		
2	How can we preserve the weakening of superstitious thinking among educated people in our society for future generations?		

**The respondents sign the form when informed of their answers and agree to them.*