

Superstition, Gender, and Socio Economic Determinants: A Mixed Methods Study in Rural Sindh, Pakistan

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ABSTRACT

Superstition defined as beliefs or practices that lack scientific justification has been historically linked to psychological attempts to reduce uncertainty and anxiety. While often regarded as a rural or uneducated phenomenon, contemporary research indicates its persistence across all social strata, with potential negative impacts on mental health, decision-making, and socioeconomic development. This mixed-methods study investigates the prevalence, gender differences, and socio-economic determinants of superstition among rural residents of Taluka Mehrabpur, District Naushehro Feroze, Sindh, Pakistan. Using Nominal Group Technique (NGT, $n = 13$) to identify local superstitious beliefs followed by a structured survey ($n = 200$, 50% female), we assessed superstition level via a validated 39-item Likert scale. Quantitative data were analysed using descriptive statistics and multiple linear regression. Results show that 65% of respondents held a high level of superstition, with females significantly more superstitious than males ($\beta = 0.144$, $p < 0.05$). Formal education ($\beta = -0.306$, $p < 0.05$) and family income ($\beta = -0.255$, $p < 0.05$) were the strongest negative predictors, whereas religious education ($\beta = 0.243$, $p < 0.05$), living in homogenous communities ($\beta = 0.303$, $p < 0.05$), joint family structure ($\beta = 0.117$, $p < 0.05$), and inherited property ($\beta = -0.142$, $p < 0.05$) significantly increased superstitious beliefs. The study concludes that superstition in rural Sindh is deeply embedded in socio-cultural and economic contexts, acting as a potential barrier to rational decision-making and community development. Interventions should focus on enhancing formal education, economic empowerment, and culturally sensitive awareness programmes, particularly targeting women and closed community networks.

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1. INTRODUCTION

When people face unpleasant and uncontrollable life events such as health crises, economic instability, or natural disasters, they may adopt irrational beliefs to create illusory patterns and restore a sense of predictability (Risen, 2016). Such beliefs are regarded as 'superstition'. Superstition is generally defined as irrational beliefs or practices lacking scientific justification, representing a universal psychological phenomenon rooted in human attempts to interpret uncertainty and regain perceived control (Tylor, 1871; Whitson & Galinsky, 2008). Superstition serves as a cognitive coping mechanism in contexts where logical explanations are absent or inaccessible (Malinowski, 1948; Risen, 2016). Despite advances in education and scientific literacy, superstition persists across societies, transcending geographic, cultural, and socioeconomic boundaries (Vyse, 1997; Hood et al., 2009). Superstition often becomes deeply embedded in cultural and religious frameworks, even in developed nations where it may serve both as a psychological comfort (Vyse, 2013; Safaei & Khodabakhshi, 2012). Empirical evidence suggests that superstitious beliefs are associated with reduced critical thinking, delayed healthcare-seeking, resistance to modern technologies, and reinforcement of gender inequalities (Bibi et al., 2022; Ahmed, Malik and Bashir, et al. 2024). Furthermore, during crises such as the COVID-19 pandemic, individuals with stronger superstitious tendencies are more vulnerable to misinformation and psychological distress (Hoffmann, Plotkina, Roger, & D'Hondt, 2022).

Research from around the world shows that superstitions are not born from a single cause but from a mix of societal problems. The strongest reason is poverty and financial problems: when people are poor, they cannot afford doctors or good schools, so they turn to cheap spiritual healers and charms for help (Shaikh et al., 2025; Bora & Das, 2022; Hussain et al., 2025). This problem gets worse because of a big education gap, where many people, especially in rural areas, never go to proper schools and, without education, do not learn science or how to think critically, so they easily believe in traditional or superstitious values (Khan & Mohyuddin, 2014; Ateeqa et al., 2025; Daraz et al., 2024; Suyuhan et al., 2026). This situation creates a psychological need for control because when life is uncertain and scary, people feel helpless, and believing in superstitions gives them a false sense that they can control their fate (KS, et al. 2025; Pournesaei, 2023; Keinan, 1994; Chen & Khoso, 2025). These feelings are then passed down in families and communities, as parents and elders teach these beliefs to their children, making them a normal part of culture (Khan & Mohyuddin, 2014; Ellala et al., 2022). Sometimes, religion is mixed with these beliefs, making them seem acceptable, visiting a pir or a spiritual leader instead of a doctor (Shehzad, 2025; Ali et al., 2022). At the same time, governments fail to provide basic services, as in many villages, there are no hospitals, no mental health doctors, and no fair justice system, which makes superstition the only choice people have (Hussain, Zaka, & Niaz, 2025; (Ahmed, et al. 2023); Maltsev & Dementyev, 2021). Businesses and markets make money from these beliefs, as they sell lucky charms, use lucky numbers in prices, and market products based on zodiac signs (Avcı & Yıldız, 2021; Simmons & Schindler, 2003). Finally, gender inequality makes it worse for women, because in places like rural Sindh and Punjab, women have less education, less freedom to move around, and fewer choices, making them more likely to depend on superstitions for their problems (Wiseman, 2003; Hussain et al., 2025; Shaikh et al., 2025). Other factors, such as stress (Barbek et al., 2022; Ying et al., 2024), digital misinformation on social media (Pennycook et al., 2020), and living in closed, traditional communities (KS, et al. 2025; Ateeqa et al., 2025), also strengthen superstitions.

The harm caused by this system is deep and affects every part of life. Studies from Pakistan, India, Turkey, Uganda, Jordan, Africa, and many other places prove that superstition blocks real development and progress (Khan & Mohyuddin, 2014). For mental health, it is very damaging, as it causes high levels of anxiety, depression, and fear, stops people from thinking clearly, and makes them feel powerless (Pournesaei, 2023; Ateeqa et al., 2025; Malik et al., 2024). In physical healthcare, it is deadly, for example, in rural Pakistan, where people die because they think their sickness is caused by ghosts or magic and delay going to the hospital (Shehzad, 2025), in Uganda, where babies are physically harmed because of traditional rituals (Uwayezu, et al., 2022), and in Punjab, Pakistan, where pregnant women follow dangerous food rules that risk their lives and their babies' lives (Jabbar et al., 2025). Economically, it wastes

household money, as poor families spend their small income on amulets (taweez), healers (pirs), and rituals instead of on food, medicine, or education (Khan & Mohyuddin, 2014; Hussain et al., 2025; Rao et al., 2026), and in Turkey, it encourages luck-based spending, which is bad for the economy (Avcı & Yıldız, 2021). In farming, it reduces yields, as farmers in rural Punjab resort to magic rituals rather than scientific methods, so their crops fail and they remain poor (Ali et al., 2022). In education, it undermines student performance, as seen in the UAE and Saudi Arabia, where students prioritize luck over hard work and often fail their exams (Ellala et al., 2022; Yamani et al., 2025).

Within families and for women, it increases vulnerability (Bhutto et al., 2026). It causes violence, such as in Assam, India, where women are killed after being falsely accused of witchcraft (Bora & Das, 2022), and in Hyderabad, Sindh, where women with less power believe more in superstitions (Shaikh et al., 2025), and it leads to social abuse against people whose illnesses are seen as supernatural (Qazi et al., 2024). Beyond human society, it causes direct harm to animal welfare, as seen in India with practices like the fatal force-feeding of milk to snakes (Vincent, 2021). It erodes governance and public trust when there is no government or justice; people resort to superstition to resolve conflicts, which is almost unfair (Maltsev & Dementyev, 2021). Finally, in the digital realm, it amplifies public health risks, as during COVID-19, superstitions mixed with fake news on social media worsened the health crisis (Yamani et al., 2025; Hoffmann et al., 2022; Asif & Khoso, 2025). In short, superstition is not a small cultural habit; it is a major disease that destroys health, wealth, education, family life, and justice.

While extensive research exists on superstition in Western and East Asian contexts, rational investigations in Pakistan particularly in rural Sindh remain notably scarce. Prevailing assumptions often associate superstition exclusively with illiteracy or rural isolation, yet emerging studies indicate its persistence even among educated and urban populations (Khan & Mohi-ud-din, 2020; Imran, 2024), suggesting that superstition cannot be explained solely by educational attainment but is influenced by a complex interplay of socioeconomic, cultural, and psychological factors. Similarly, in rural Sindh, superstitious beliefs are frequently normalized as cultural (non-religious) or religious values, making them less visible as social or developmental concerns. Communities may lack awareness of the psychological and economic implications of these beliefs, perceiving them instead as harmless traditions. Consequently, there is a critical need for systematic, culturally contextualized research to examine the prevalence of superstition and its determinants in this understudied region. This study, therefore, sought to address this research gap by identifying the most common superstition beliefs among rural residents of the district of Naushehro Feroze, Sindh province, Pakistan, and establishing a nexus with selected, repeatedly measured socioeconomic sub-variables as predictors. The findings are expected to contribute to the limited literature on superstition in Pakistan and provide evidence-based insights for policymakers, educators, and development practitioners working in rural contexts.

2. METHODS

2.1 Research Design

This study adopted a mixed-methods research approach with an explanatory sequential design (Creswell & Clark, 2017). The rationale for using a mixed-methods approach was to quantify the levels and patterns of superstition among rural populations and to conduct an in-depth exploration of related information (Cresswell, 2011).

2.2 Study Area

The study was conducted in the taluka of Mehrabpur, District Naushehro Feroze, Sindh Province, Pakistan, purposively selected for its predominantly rural population, strong traditional social structure, and the visible presence of cultural and religious belief systems that influence everyday life. Additionally, agriculture is the primary livelihood in the region, and access to formal education and scientific awareness remains limited for a significant proportion of the population (Agency, 2022). These characteristics make the study area suitable for examining the prevalence and determinants of superstition within a rural development context.

2.3 Quantitative Methodology

2.3.1 Population and Sample Size

The target population consisted of 'adult male and female residents of Taluka Mehrabpur'. A total sample of 400 respondents was selected for the quantitative phase, comprising 200 males and 200 females, ensuring equal gender representation. The sample size was considered adequate (Shaikh, Kakepoto, & Khaskheli, 2025) to capture variations in socio-demographic characteristics and levels of superstition within the study area.

2.3.2 Sampling Technique

Eventually, a multi-stage cluster sampling technique was employed (Bhandari, 2023), in which all the UCs (Union Councils) of Taluka Mehrabpur were targeted in the first stage. In the second stage, two or three main/well-known villages from each UC were selected, followed by two households (one male and one female) from the targeted houses, which were randomly selected. This approach ensured geographical coverage and minimized selection bias (Khan, et al., 2021).

Table1. Sampling Frame

Taluka	Union Council	Villages	No.
MEHRABPUR	Hote Khan Jalbani	Hote Khan Jalbani	20
		Chibhur Banbhan	10
		Haji Hairo Khan Chang	10
		Rajo Dahri	16
	Lakha road	Haji Photo Dahri	12
		Ghulam Hyder Khand	12
		Jiando Rajper	20
	Jiando Rajper	Haji Moledino Rajper	10
		Saien Dino Chang	10
		Muhammad	
	Saeed pur	Ramzan	12
		Khaskheli	
		Rawat Khan	
		Khaskheli	16
	Saleh Sahito	Durani Khan Lashari	12
		Saleh	
		Sahito	16
		Noor muhammad Aamur	12
	Kotri	Laik Muhammad Sahito	12
		Mad Koondhar	16
		Saindad Jalbani	8
	Kabir	Kouro Keerio	16
	Behlani	Ali Bux Soomrah	12

		Mukhtiyarabad	12
		Peer Qaim Shah	16
		Khan Muhammad Sahito	12
	Nauabad	Ali Sher Chang	16
		Mohammad Liaqat Sahito	12
		Mehar Haji	14
	Mehar Haji	Jagan Lashari	18
		Sultan Wighio	8
		Dehat	16
	Dehaat	Mola Bux Bohio	12
		Abbas Koondhar	12
Total	10	30	400

2.3.3 Data Collection

Quantitative data were collected using a structured questionnaire developed from available literature and preliminary qualitative findings (Ranganathan & Caduff, 2023). The questionnaire included sections on socio-economic background, demographic characteristics, and superstition-related knowledge. In this regard, an 11-point Likert scale (0=No idea; 1=Strongly disagree to agree 10=Strongly) was used to measure the intensity of belief in various superstitious practices. The instrument was pre-tested to ensure clarity, validity, and cultural appropriateness before final administration.

2.3.4 Validity and Reliability

Content validity was ensured through expert review by the postgraduate supervisory committee and incorporation of locally relevant superstitious beliefs identified during the qualitative (NGT) phase. Reliability of the scale was assessed using Cronbach's alpha, which indicated acceptable internal consistency (≥ 0.7) for the superstition measurement scale.

2.3.5 Data Analysis

Quantitative data were analyzed using SPSS software, in which both descriptive (frequencies, percentages, mean, and mode) and inferential (regression) analyses were conducted. Inferential statistical techniques, including regression analysis, were applied to identify possible factors influencing superstition.

2.4 Qualitative Methodology

2.4.1 Qualitative Research Approach

The qualitative phase aimed to explore the cultural meanings, social interpretations, and contextual foundations of superstitious beliefs identified in the quantitative findings. A participatory qualitative approach was adopted to capture the participants' indigenous knowledge and lived experiences.

2.4.2 Sample Size and Selection

A total of 13 participants (male and female) were selected for the qualitative phase using purposive sampling. Participants were chosen based on their knowledge, experience, and involvement in community practices related to superstition, ensuring that information-rich cases were included in the study.

2.4.3 Data Collection Technique

The Nominal Group Technique (NGT) was used as the primary qualitative data collection method. NGT sessions were conducted to systematically generate, discuss, and prioritize commonly practiced superstitious beliefs within the community. This method facilitated equal participation, minimized individual dominance, and

enabled collective identification of locally relevant superstitious values. The qualitative findings from NGT were later used to construct the quantitative survey instrument and assess generalization.

2.4.4 Data Analysis

Qualitative data obtained through NGT (Nominal Group Technique) were analyzed manually and thematically at the end of the session, so that all participants agreed upon the findings and categorization (Hadley S, et al., 2019). The Nominal Group Technique (NGT) is a structured consensus method developed by (Delbecq & Van de Ven, 1971) to facilitate effective group decision-making and problem-solving. It is particularly useful when a problem is complex or unclear. The process ensures unbiased participation by first having group members independently generate ideas. These ideas are then shared, discussed, and clarified in a structured manner. Finally, through a ranking or voting process, the group establishes precise priorities, which serve as a clear foundation for the subsequent stages of problem-solving (Fox, 1989). Superstitious beliefs were categorized into religious and non-religious domains and refined based on group consensus. The outcomes of the qualitative analysis provided conceptual clarity and contextual grounding for the quantitative phase, ensuring coherence between both methodological components.

2.5 Ethical Considerations

Ethical approval was obtained prior to data collection following established ethical guidelines (Gelling, 2016). Participants were informed about the purpose of the study, and informed consent was obtained in accordance with the British Educational Research Association's ethical guidelines (BERA, 2018). Participation was voluntary, anonymity was maintained, and respondents were assured of confidentiality. Participants were free to withdraw from the study at any stage without consequence.

3. FINDINGS AND DISCUSSION

This study was designed to investigate the prevalence, nature, and determinants of superstitious beliefs among the rural population of Taluka Mehrabpur, District Naushahro Feroze, Sindh. By employing a mixed-methods approach, I first identified locally prevalent superstitions through the Nominal Group Technique (NGT) and then quantified their acceptance and underlying factors through a survey of **400 respondents (200 males and 200 females)**. In the following sections, I integrate these quantitative findings with qualitative insights, link them to established theoretical frameworks, and compare them with superstitions reported in other cultures globally where authentic references are available.

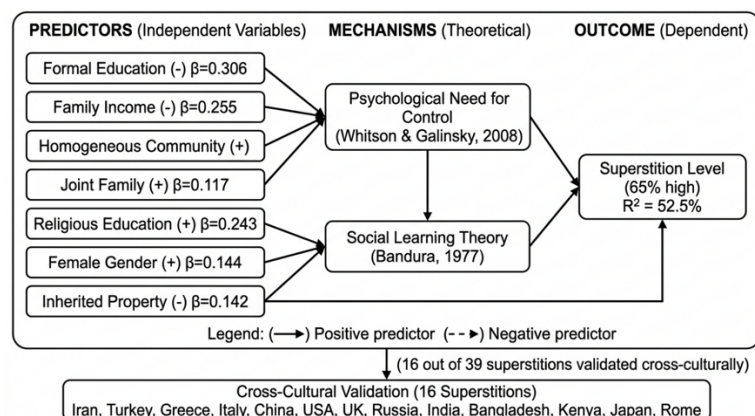


Figure 1. Conceptual Framework of Determinants of Superstitious Beliefs in Rural Sindh

Figure 1 presents the conceptual framework of this study, illustrating how seven significant predictors influence superstition levels through psychological and social learning mechanisms.

Note: This framework integrates seven significant predictors identified through multiple regression analysis ($N=400$, Adjusted $R^2 = 0.525$, $p < .001$). Positive predictors ($\beta > 0$) are shown with solid arrows, negative predictors ($\beta < 0$) with dashed arrows. The mediating mechanisms draw upon Psychological Need for Control Theory (Whitson & Galinsky, 2008) and Social Learning Theory (Bandura, 1977). Cross-cultural validation confirms that 16 out of 39 documented superstitions exist in other cultures globally.

3.1. Demographic and Socio-Economic Profile of Respondents

My analysis revealed that 82% (328 out of 400) were aged 34 years and above. Formal education was critically low; 38% (152 respondents) were illiterate, and 23.5% (94 respondents) had only primary schooling. Thus, 61.5% (246 respondents) had education at primary level or below.

The economic profile showed vulnerability, with 68% (272 respondents) earning PKR 30,000 or less monthly. This economic precarity triggers the **Psychological Need for Control Theory** (Whitson & Galinsky, 2008). Poverty creates chronic uncertainty, and superstitious beliefs serve as a coping mechanism offering illusory control (Risen, 2016; Torgler, 2007). Shaikh et al. (2025) in Hyderabad and Yildiz et al. (2023) in Turkey confirmed similar patterns.

Social structures also play a role. Most respondents lived in homogeneous caste communities (67.5% - 270 respondents) and joint family systems (46% - 184 respondents), with 82.5% (330 respondents) residing in inherited property. These closed environments are ideal for transmitting traditional worldviews, supporting Social Learning Theory (Bandura, 1977). This observation is consistent with findings from Chakraborty (2017) in Assam, India, who noted that superstitious beliefs are more prevalent in communities with strong kinship and caste-based networks, and Ateeqa et al. (2025) in Multan and Ghotki observed similar patterns.

3.2. Overall Prevalence and Gender Dynamics of Superstition

A substantial 65% (n=260) of respondents exhibited high levels of superstitious belief. Gender disparity was clear: 70% of females (140 out of 200) fell into the high-superstition category compared to 60% of males (120 out of 200). Regression analysis confirmed this ($\beta = 0.144$, $p < .05$).

This finding aligns with Farooq and Kayani (2012) in Punjab, Shrivastav (2018) in India, and Al-Zou'bi (2025) in Jordan. This gender gap reflects women's social vulnerability in patriarchal structures. Women have less access to formal education (Dhillon, 2014) and restricted mobility. Their powerlessness heightens the need for control, and superstitious practices offer influence over family and health matters. This also supports **Deprivation Theory** (Glock & Stark, 1965), as marginalized groups turn to supernatural beliefs for psychological compensation. Jabbar et al. (2025) found similar patterns among pregnant women in Punjab.

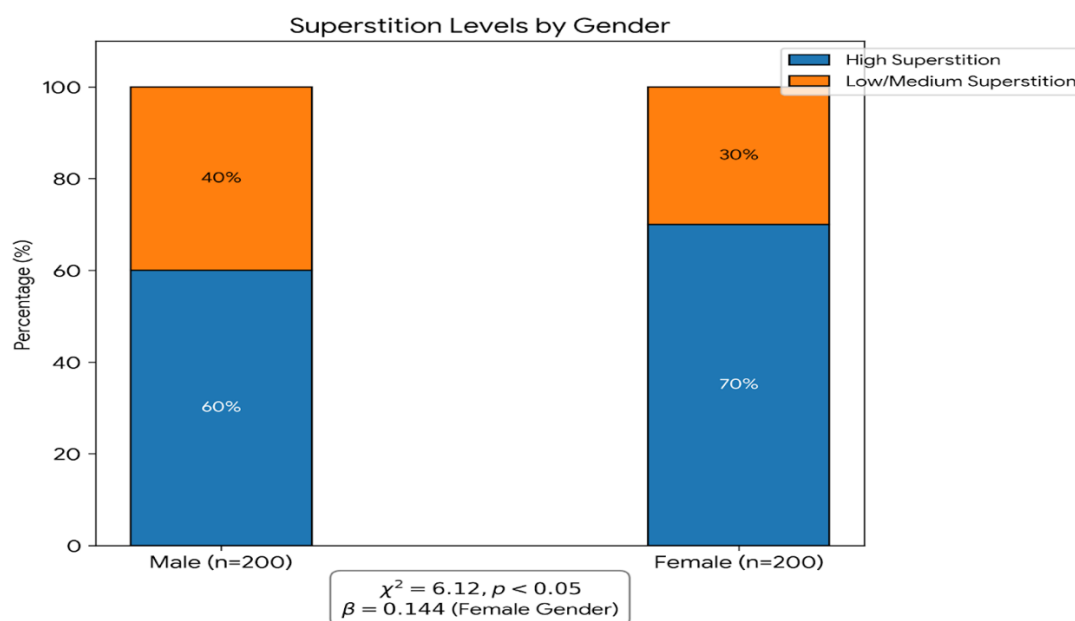


Figure 3. Gender Differences in Superstition Levels

Note: A significantly higher proportion of female respondents (70%) exhibited high levels of superstition compared to male respondents (60%). This gender difference was statistically significant in the regression model ($\beta = 0.144$, $p < 0.05$).

3.3. Nominal Group Technique (NGT) Findings

The NGT session generated 58 superstitious beliefs. After removing 11 duplicates, the list narrowed to 47 items. An Islamic scholar recommended eliminating 8 items that contradicted Islamic teachings. The final validated list contained 39 superstitious beliefs, categorized into 18 religious and 21 non-religious items.

Key Observations from NGT:

1. **Gender Differences in Reporting:** Female participants contributed more household, child, and marriage-related beliefs, while males focused on agricultural and economic activities.
2. **Intergenerational Transmission:** Older participants learned beliefs from grandparents, supporting **Social Learning Theory** (Bandura, 1977). One participant stated: *"These beliefs have been in our family for generations."*
3. **Religious vs Cultural Confusion:** Participants could not distinguish between Islamic teachings and cultural superstitions, explaining why **religious education** ($\beta=0.243$) positively predicts superstition.

The **39 items** were used to develop my **10-point Likert scale** (Cronbach's alpha = 0.815).

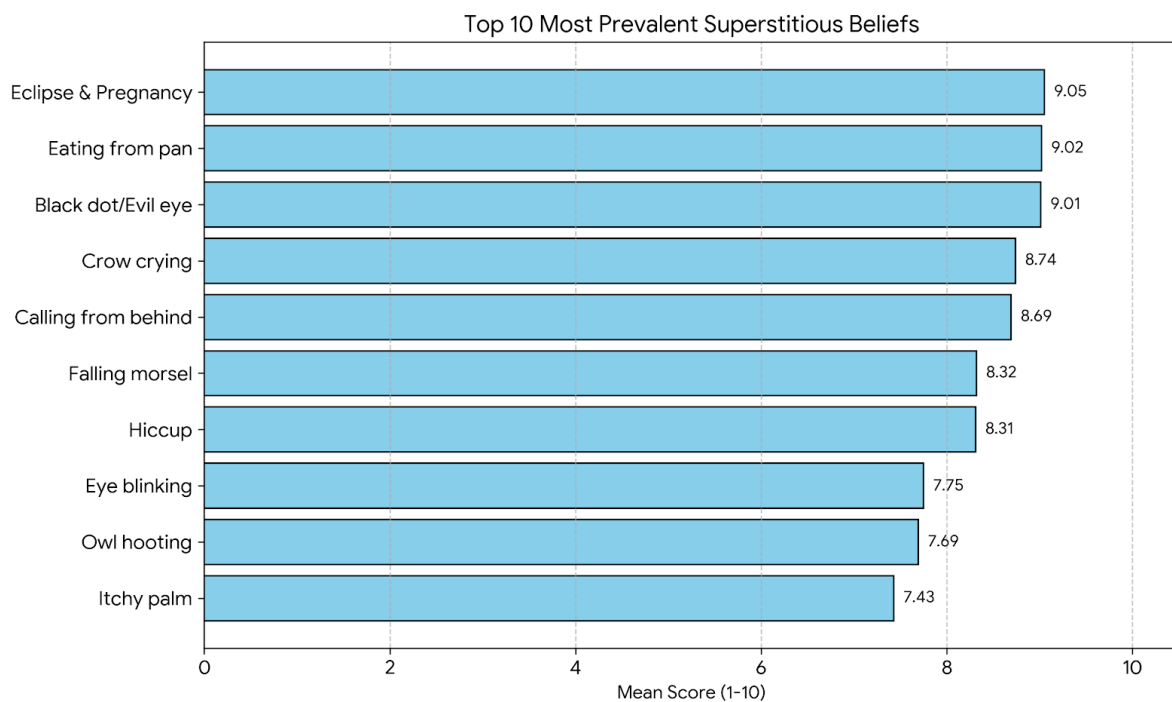


Figure 4. Ten Most Prevalent Superstitious Beliefs among Rural Respondents (N=400)

Note: All items were measured on a 10-point Likert scale (1 = Strongly disagree to 10 = Strongly agree). The top three beliefs (eclipse and pregnancy, eating from pan, evil eye) scored above 9.0, indicating very strong prevalence in the study area.

3.4. Cross-Cultural Comparison of Superstitious Beliefs

The NGT sessions generated 39 distinct superstitious beliefs. When I compare these beliefs with those reported in other cultures, I find that many are not unique to Sindh but are part of a broader global tapestry of superstition. Table 2 presents a comparison of only those beliefs for which authentic references are available.

Table 2: Verified Cross-Cultural Comparison of Superstitious Beliefs

No.	Superstitious Belief (from Thesis)	Category	Also Reported In	Source(s)
01	Pregnant woman working during eclipse causes disabled child	Religious	Iran, Africa, South America, Turkey	Rabiei et al. (2013); Uwayezu et al. (2022); Yildiz et al. (2023)
03	Black dot on child's head protects from evil eye	Religious	Greece (<i>mati</i>), Turkey (<i>nazar boncuğu</i>), Italy (<i>malocchio</i>), India, Bangladesh	Galt (1982); Avci & Yıldız (2021); An et al. (2019); Qamar (2016)
04	Crow crying indicates guests coming	Non-religious	India, Pakistan (Punjab), Khyber Pakhtunkhwa	Farooq & Kayani (2012); Daraz et al. (2024)
07	Hiccup means someone is remembering you	Non-religious	UK, USA, Europe, Kenya	Espinal (2020); Radford & Radford (1949)
09	Owl hooting indicates bad luck	Religious	Ancient Rome, UK, Khyber Pakhtunkhwa (Pakistan)	Daraz et al. (2024); Radford & Radford (1949)
10	Itchy palm signifies gain/loss of money	Non-religious	UK, USA, Kenya, India	Espinal (2020); Radford & Radford (1949); An et al. (2019)
14	Giving money after sunset is not good	Religious	Russia, India	Tahir et al. (2018); An et al. (2019)
18	Do not hang child's clothes on wire at night	Non-religious	India, Bangladesh	An et al. (2019)

No.	Superstitious Belief (from Thesis)	Category	Also Reported In	Source(s)
19	Brooming after sunset decreases provision	Religious	Pakistan (Punjab), India, Bangladesh	Farooq & Kayani (2012); Tahir et al. (2018); An et al. (2019)
20	Widow should avoid attending marriage	Religious	India	An et al. (2019)
24	Never sow pepil/jujube tree in courtyard	Religious	India	An et al. (2019)
26	Breaking glass is bad omen	Non-religious	UK, USA	Radford & Radford (1949); Espinal (2020)
27	Black cat crossing path is bad luck	Non-religious	USA, UK, Europe	Espinal (2020); Daraz et al. (2024); Radford & Radford (1949)
30	Fortune telling correctly indicates future	Religious	UK, USA, Europe, Iran, India	Torgler (2007); Safaei & Khodabakhshi (2012); An et al. (2019)
32	Horseshoe on door avoids evil eye	Religious	UK, USA, Europe	Espinal (2020); Radford & Radford (1949)
38	Lucky/unlucky numbers, days, months	Religious	China (8 lucky, 4 unlucky); USA (13 unlucky)	Torgler (2007); Espinal (2020); Avcı & Yıldız (2021)

Eclipses (Item 1): Uwayezu et al. (2022) note similar beliefs in Africa and South America. Rabiei et al. (2013) found it in Iran, and Yıldız et al. (2023) in Turkey. This universality supports the **Psychological Need for Control Theory** (Malinowski, 1948).

Evil Eye (Item 3): Galt (1982) documented it across Europe and Asia. In Turkey, Avcı and Yıldız (2021) discuss the *nazar boncuğu*. An et al. (2019) included it in their Indian Superstition Scale. This widespread belief supports **Cultural Transmission Theory**.

Animal Omens (Items 4, 9, 27): Foster & Kokko (2009) explain this as our tendency to seek causal relationships between unrelated events. This supports **Dual-Process Theory** (Kahneman, 2011).

Bodily Signs (Items 7, 10): Radford and Radford (1949) document these in Western cultures. (Espinal, 2022) notes similar beliefs in Kenya.

Domestic Practices (Items 14, 18, 19, 20, 24, 26, 32): Tahir et al. (2018) found parallels in Russia, and An et al. (2019) in India. These taboos reflect **Social Learning Theory** (Bandura, 1977).

Fortune Telling (Item 30): Torgler's (2007) multi-country analysis found significant belief across 17 countries. This supports **Deprivation Theory**.

Lucky Numbers (Item 38): In China, 8 is lucky and 4 unlucky (Chau et al., 2001; Woo & Kwok, 1994). In the West, 13 is unlucky (Scanlon et al., 1993; Nayha, 2002). This supports **Cultural Transmission Theory**.

Thus, **16 out of 39 superstitions** have authentic references in other cultures globally.

3.5. Determinants of Superstitious Beliefs: Regression Analysis

Multiple linear regression on **400 respondents** was significant ($F(7,392)=32.48$, $p<.001$), explaining **52.5%** of variance (Adjusted $R^2=0.525$). Seven predictors emerged (Table 3).

Table 3. Significant Predictors of Superstition (Multiple Regression, N=400)

Predictor	β	P-value	Theoretical Link	Supporting Paper(s)
Formal Education	-0.306	<.001	Psychological Need for Control; Dual-Process Theory	Torgler (2007); Safaei & Khodabakhshi (2012); Dhillon (2014); Solomon & Ekong (2015); Sehar et al. (2022)
Homogeneous Community	0.303	<.001	Social Learning Theory	Ateeqa et al. (2025); Daraz et al. (2024) ; Chakraborty (2017)
Family Income	-0.255	<.001	Deprivation Theory; Psychological Need for Control	Torgler (2007); Shaikh et al. (2025); Bora & Das (2022); Yildiz et al. (2023)
Religious Education	0.243	<.001	Social Learning Theory	Torgler (2003, 2007); Al-Zou'bi (2025); An et al. (2019)
Female Gender	0.144	.007	Both Theories; Social Vulnerability	Farooq & Kayani (2012); Al-Zou'bi (2025); Shrivastav (2018); Jabbar et al. (2025)

Predictor	β	P-value	Theoretical Link	Supporting Paper(s)
Inherited Property	-0.142	.006	Psychological Need for Control (Economic Security)	(Odermatt, & Stutzer, 2022)
Joint Family System	0.117	.020	Social Learning Theory	Farooq & Kayani (2012); Tahir et al. (2018); Ateeqa et al. (2025)

Formal Education ($\beta = -0.306$) was the strongest negative predictor. As education rises, superstition falls. Education strengthens System 2 thinking (Kahneman, 2011; Al-Zou'bi, 2025), reducing reliance on intuitive System 1.

Religious Education ($\beta = 0.243$) was a positive predictor. Despite Islamic teachings against superstition, rote memorization without critical engagement may reinforce traditional beliefs. This supports Social Learning Theory as religious teachers act as social models.

Homogeneous Community ($\beta = 0.303$) was the strongest positive predictor, powerfully demonstrating Social Learning Theory. Closed communities create feedback loops reinforcing superstitions. Chakraborty (2017) in Assam found similar patterns, and Ateeqa et al. (2025) noted that superstitions are "deeply woven" into community life in Multan and Ghotki.

Family Income ($\beta = -0.255$) negatively predicted superstition, supporting Deprivation Theory and Need for Control Theory.

Joint Family System ($\beta = 0.117$) positively predicted superstition, as elders transmit beliefs to younger generations.

Female Gender ($\beta = 0.144$) remained significant, reflecting women's social vulnerability.

Inherited Property ($\beta = -0.142$) showed economic security reduces superstition (Odermatt & Stutzer, 2022).

4. CONCLUSION

Study concludes that superstition in rural Sindh is a deeply entrenched phenomenon, rooted in a complex interplay of socioeconomic vulnerability and social learning. It is not merely a product of individual ignorance but is systematically predicted by low formal education, poverty, and residence in closed social structures. The research also highlights the paradoxical role of conventional religious education, which currently appears to reinforce, rather than reduce, these beliefs. My comparison with global literature, based on verified references, confirms that several key superstitions I documented—such as those related to eclipses, the evil eye, animal omens, domestic practices, bodily signs, fortune telling, and lucky numbers—are local manifestations of universal human attempts to find meaning and control in an uncertain world.

These findings have profound implications for policy and development. Superstition is not a harmless cultural artifact; it can impede healthcare-seeking behavior (Shehzad, 2025), perpetuate gender inequality (Bora & Das, 2022), waste household resources (Hussain et al., 2025), and undermine education (Ellala, et al., 2022). Therefore, I recommend multi-pronged interventions:

1. **Transformative Education:** Promote critical thinking in both formal and religious schools.
2. **Economic Empowerment:** Alleviate poverty to reduce the need for superstitious coping.

3. **Community-Based Awareness:** Engage elders and religious scholars in culturally sensitive campaigns.
4. **Gender-Focused Programming:** Target women with education and economic opportunities.

Limitations and Future Research

My study is limited by its cross-sectional design, which precludes causal inference, and its focus on a single taluka, limiting generalizability. Although the sample size of **400 respondents** is robust for this context, the findings may not be representative of all rural areas in Sindh or Pakistan. Additionally, for 23 out of 39 superstitions, I could not find authentic references documenting their presence in other cultures, suggesting they may be unique to South Asia or under-documented in academic literature. Future research should employ longitudinal designs to track changes over time and include comparative studies across different regions of Pakistan to understand how varying cultural and economic contexts shape superstitious beliefs. Qualitative ethnographic research would also be valuable to explore the lived experience of these beliefs in greater depth. Additionally, incorporating psychological variables such as anxiety, locus of control, and cognitive style could provide a more nuanced understanding of the individual-level factors that interact with socio-economic determinants.

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REFERENCES

- Agency, S. E. (2022). *Environmental Impact Assessment (EIA) Report for Naushahro Feroze Industrial Park (NFIP)*. Government of Sindh, Sindh Environmental Protection Agency, Government of Sindh. Karachi: Indus Environmental Engineering Consultants. Retrieved from <https://epa.sindh.gov.pk/files/EPA-Sindh/EIA-IEE/EIA-%20NFIP%2019-12-22.pdf>
- Ahmed, F., Malik, N. I., Bashir, S., Noureen, N., Shahid Ullah, Ahmed, J. B., . . . Tang, K. (2024). An obedient wife never says "no" to her virtual god." High fertility conceptions and barriers to contraceptive use among mothers of Southern Pakistan: a qualitative study. *BMC public health*, 24(1), 2157. doi:10.1186/s12889-024-19484-9
- Ahmed, F., Malik, N. I., Zia, S., Akbar, A. S., Li, X., Shahid, M., & Kun, T. (2023). Rural mothers' beliefs and practices about diagnosis, treatment, and management of children health problems: A qualitative study in marginalized Southern Pakistan. *Frontiers in public health*, 10, 1001668. doi:10.3389/fpubh.2022.1001668
- Al zou'bi, R. (2025). The Invisible Shackles: Unveiling Superstitious Thinking Level among Postgraduate Diploma Students at Al al-Bayt University. *Manara*, 4(2). doi:10.59759/educational.v4i2.1042.
- Ali, H., Razzaq, A. R., & Majeed, M. F. (2022). An Invisible Universe of Evil: Supernatural Beliefs and Practices among Farmers in Punjab. *Pakistan Languages and Humanities Review*, 6(2), 994-1002. doi:10.47205/plhr.2022(6-II)841

- An, S., Kapoor, N., Setia, A., Agiwal, S., & Ray, I. (2019). The Indian superstition scale: creating a measure to assess Indian superstitions. *Journal of Beliefs & Values*, 40(2), 1-10. doi:10.1080/13617672.2019.1570452
- Asif, M., & Khoso, A.R. (2025). Educating Under Pressure: A Sociological Analysis of Academic Stress and Mental Well-being among Graduate Students in Sindh. *Symbiohealth*. <https://doi.org/10.59525/symbiohealth.1051>
- Asif Rao, M., Aslam Khan, A., Javed Sheikh, M., & Gul, B. (2026). ASSESSING THE BASIC HEALTH FACILITIES AND SATISFACTION LEVEL OF RURAL PEOPLE IN THE EVIDENCE FROM DISTRICT SANGHAR, PAKISTAN. *International Journal of Advanced Research*. <https://doi.org/10.21474/ijar01%2F22808>
- Ateeqa, Qasim, T. B., Riaz, I., & Nihal, T. (2025). An exploratory analysis of beliefs in superstitious among the people of Multan and Ghotk. *Journal of Statistics, Computing and Interdisciplinary Research*, 7(1), 41- 49.
- Avcı, İ., & Yıldız, S. (2021). The Effect of Superstitions on Consumer Luck, Horoscope and Evil EyeOriented Purchasing Behavior: A Study in Turkey. USF M3 Publishing.
- Bandura, A. (1977). *Social Learning Theory*. NJ: Prentice Hall: Englewood Cliffs.
- BERA. (2018, June 20). Ethical guidelines for educational research. London: British Educational Research Association. Retrieved from <https://www.bera.ac.uk/researchers-resources/publications/ethical-guidelines-for-educational-research-2018>
- Bhandari, P. (2023, June 22). Multistage Sampling | Introductory Guide & Examples. Scribbr. Retrieved February 20, 2026, from <https://www.scribbr.com/methodology/multistage-sampling>
- Bibi, I., Nighat, B., Khan, Y., & Parveen, M. (2025). THE INTERSECTION OF SUPERSTITIONS AND MENTAL HEALTH: HOW BELIEFS SHAPE PSYCHOLOGICAL WELL-BEING IN PAKISTAN. *International Journal of Social Sciences Bulletin*, 3(5), 73-80.
- Bora, D., & Das, B. (2022). Nexus between poverty and superstitious beliefs among tribal communities of Assam: A case study of Rabha tribe. *Journal of the Anthropological Survey of India*, 71(2), 1-17. doi:10.1177/2277436X2211022
- CHAKRABORTY, S. (2017). A COMPARATIVE ANALYSIS OF SUPERSTITIOUS BELIEFS EXISTING AMONG COLLEGE STUDENTS. *International Journal of Educational Science and Research*, 7(6), 57-66.
- Chen, Q., & Khoso, A.R. (2025). Evaluating the Effects of Ideological and Political Education on Civic Engagement and Social Behavior among University Students: A Case Study of Sindh Agriculture University Tandojam, Pakistan. *SAGE Open*, 15. <https://doi.org/10.1177/21582440251365400>
- Chukkali, S., & Dey, A. M. (2020). Development and Validation of Superstitious Beliefs Scale. *Rupkatha Journal on Interdisciplinary Studies in Humanities*, 12(1). doi:10.21659/rupkatha.v12n1.32
- Cresswell, J. W. (2011). *Educational Research Planning: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*.
- Creswell, J. W., & Clark, V. L. (2017). *Designing and Conducting Mixed Methods Research*. SAGE.
- Daraz, U., Ibrahim, M., Hakim, A., Hussain, Z., & Khan, W. (2024). Myths and Realities: How Different Forms of Superstitious Beliefs Create Good and Bad Luck for People in Pakistan through an Anthropological Lens. *Myths and Realities: How Different Forms of Superstitious Beliefs Create Good and Bad Luck Journal of Education and Social Studies*, 5(2), 562-570. doi:<https://doi.org/10.52223/jess.2024.5235>
- Delbecq, A., & Van de Ven, A. (1971). A Group Process Model for Problem Identification and Program Planning. *The Journal of Applied Behavioral Science*, 7(4), 466-492.
- Dhillon, C. K. (2014). Superstitions among female adolescent. *Scholarly Researched Journal for Interdisciplinary Studies*, 8(2), 1640-1648.
- Ellala, Z. K., Alsalhi, N. R., Abu Attiyeh, J. H., Alqudah, H., Alakashee, B., Al-Qatawneh, S., & Gad, S. M. (2022). The impact of superstitious ideas on the students' failure: An empirical investigation of Al-Ain University, United Arab Emirates. *Przestrzeń Społeczna (Social Space) Journal*, 22(2), 368-390.

- Espinal, A. (2022). *Superstitions from around the world*. St. Cloud State: St. Cloud State University, theRepository. Retrieved from https://repository.stcloudstate.edu/ma_tesol/7
- Farooq, A., & Kayani, A. K. (2012). Prevalence of superstitions and other supernaturals in rural Punjab: A sociological perspective. *South Asian Studies*, 27(2), 335-344.
- Foster, K. R., & Kokko, H. (2009). The evolution of superstitious and superstition-like behaviour. *Proceedings of the Royal Society B: Biological Sciences*, 276(1654), 31-37. doi:10.1098/rspb.2008.0981
- Fox, W. M. (1989). The Improved Nominal Group Technique (INGT). *Journal of Management Development*, 8(1), 20-27. doi:<https://doi.org/10.1108/EUM0000000001331>
- Galt, A. H. (1982). The Evil Eye as Synthetic Image and Its Meanings on the Island of Pantelleria, Italy. *American Ethnologist*, 9(4), 664-681. doi:10.1525/AE.1982.9.4.02A00030
- Gelling, L. (2016). Applying for ethical approval for research: the main issues. *Nurs Stand*, 30(20). doi:10.7748/ns.30.20.40.s46
- Glock, C. Y., & Stark, R. (1965). *Religion and Society in Tension* (1965). 10.1007/978-3-658-15250-5_26. (3 ed.). Chicago: Rand McNally and Company. Retrieved from <https://archive.org/details/religionsocietyi0000gloc>
- Hadley S, S.-F., Michelle Y, H., Leah, T., Heather, M., Charlaime M, H., Maureen G, M., & Jennifer L, R. (2019). You Don't Know What You Don't Know: Using Nominal Group Technique to Identify and Prioritize Education Topics for Regional Hospitals. *Hospital Pediatrics*, 9(4), 300-304. doi:<https://doi.org/10.1542/hpeds.2018-0217>
- Hoffmann, A., Plotkina, D., Roger, P., & D'Hondt, C. (2022). Superstitious beliefs, locus of control, and feeling at risk in the face of Covid-19. *Personality and Individual Differences*, 196, 111718. doi:10.1016/j.paid.2022.111718
- Hood, R. W., Hill, P. C., & Spilka, . (2009). *The psychology of religion: An empirical approach* (4 ed.). (G. Press, Ed.)
- Hussain, M., Zaka, P., & Niaz, U. (2025). Magic, Charms and Modernity: A Sociological Study of Belief in Taweez and Black Magic in Age of Science in Rural Punjab. *Pakistan Journal of Social Sciences Review (PJSSR)*, 4(5), 830-837. Retrieved from <https://pjssrjournal.com/index.php/Journal/article/view/248>
- Imran, H., Sarver, A., Khan, M. U., & Khanum, S. (2024). Exploring Superstitious Beliefs Among Educated Urban Population. *Academy of Education and Social Sciences Review*, 4(1), 127-136. doi:10.48112/aessr.v4i1.664
- Jabbar, A., Sadaqat, S., Baloch, M., Hassan, S., Siyam, M. R., Siddique, F., . . . Saeed, F. (2025). Jabbar, Ayesha & Sadaqat, Sameen & Baloch, M. & Hassan, Shujia & Siyam, Mahbubur & Siddique, Fatima & Kaniz, Osheen & Ahmad, Tauseef & Saeed, Fatima. (2025). PHENOMENOLOGICAL STUDY OF SUPERSTITIOUS BELIEFS AND MENTAL WELL-BEING AMONG PREGNANT WOMEN. *Insights-Journal of Health and Rehabilitation*, 3(3), 127-134. doi:10.71000/2671k722
- Kahneman, D. (2011). *Thinking, fast and slow*. Farrar, Straus and Giroux / NewYork.
- Keinan, G. (1994). Effects of Stress and Tolerance of Ambiguity on Magical Thinking. *Journal of Personality and Social Psychology*, 67(1), 48-55. doi:10.1037/0022-3514.67.1.48
- Khan, F. A., Manzoor, S. A., Akmal, M., Imran, M. U., Taqi, M., Manzoor, S. A., . . . Joseph, S. V. (2021). Modeling pesticide use intention in Pakistani farmers using expanded versions of the theory of planned behavior. *Human and Ecological Risk Assessment: An International Journal*, 27(3), 687-707. doi:10.1080/10807039.2020.1750345
- Khan, H., & Mohiuddin, M. (2020). A comparative study of superstition in urban and rural areas. *The International Journal of Indian Psychology*, 8(2), 140-144. doi:10.25215/0802.019
- Khan, N., & Mohyuddin, D. (2014). Socio-Economic Impacts of Superstitions among Pakhtoon Women. *EUROPEAN ACADEMIC RESEARCH*, 2(8), 10696-10713. doi:10696-10713
- KS, J., Pandey, R. P., Singh, V., Sharma, T., Awasthi, P., Bumra, K., & Kumar, D. (2025). Regional Variations in Superstitious Beliefs and Locus of Control Among Students in India: A Cross-Cultural Analysis. *Mind and Society*, 14(1), 7-17. doi:10.56011/mind-mri-141-20252

- Malik, R., Akhtar, S., & Mughal, F. A. (2024). Relationship Between Locus Of Control, Paranormal Beliefs, And Magical Ideation Among Young Adults Of Pakistan. *Journal of Rawalpindi Medical College*, 28(4), 557-562. doi:10.37939/jrmc.v28i4.2416
- Malinowski, B. (1948). *Magic, Science and Religion and Other Essays*. (R. Redfield, Ed.) Glencoe, Illinois, USA: The Free Press.
- Maltsev, V. V., & Dementyev, V. V. (2021). Superstition as an economic institution: An evolutionary approach. DOI: 10.18522/2073-6606. *Terra Economicus*, 19(2), 28-38. doi:10.18522/2073-6606-2021-19-2-28-38
- Nayha, S. (2002). Traffic deaths and superstition on Friday the 13th. 2110–2111. *American journal of psychiatry*, 159(12), 2110-2111. doi:10.1176/appi.ajp.159.12.2110
- Odermatt, R., & Stutzer, A. (2022). Does the Dream of Home Ownership Rest Upon Biased Beliefs? A Test Based on Predicted and Realized Life Satisfaction. *Journal of happiness studies*, 23(8), 3731-3763. doi:10.1007/s10902-022-00571-w
- Pournesaei, G. S. (2023). Superstition and Its Association with Depression and Anxiety among University Students. *Journal of Modern Psychology*, 3(2), 41-48. doi:10.22034/jmp.2024.433937.1085
- Qamar, A. H. (2016). Belief in the Evil Eye and Early Childcare in Rural Punjab, Pakistan. *Asian Ethnology*, 75(2), 397-418.
- Qazi, F. K., Rehman, K., Waheed, S. A., Aleem, S., Ullah, S., Kibria, Z., & Asim, M. (2024). Lived experiences of COVID-19 patients admitted in isolation wards of healthcare centers in Peshawar, Pakistan: A phenomenological perspective. *Public Health in Practice (Oxford, England)*, 7, 100499. doi:10.1016/j.puhip.2024.100499
- Rabiei, K., Ghasemi, V., & Arzani, H.-R. (2013). Superstition and Cultural Diversity-Case Study: Isfahan Province, Iran. *Mediterranean Journal of Social Sciences*, 4(4), 73-82. doi:10.5901/mjss.2013.v4n4p73
- Radford, E., & Radford, M. A. (1949). *Encyclopaedia of superstitions*. Philosophical Library. New York: Philosophical Library.
- Ranganathan, P., & Caduff, C. (2023). Designing and validating a research questionnaire - Part 1. *Perspectives in Clinical Research*, 14(3), 152-155. doi:10.4103/picr.picr_140_23
- Risen, J. L. (2016). Believing what we do not believe: Acquiescence to superstitious beliefs and other powerful intuitions. *Psychological Review*, 123(2), 182-207. doi:10.1037/rev0000017
- Safaei, S., & Khodabakhshi, A. (2012). A Study of Sociological Factors of Superstitions. *Asian Journal of Research in Social Sciences and Humanities*, 2(10), 208 - 225.
- Scanlon, T. J., Luben, R. N., Scanlon, F. L., & Singleton, N. (1993). Is Friday the 13th bad for your health?. *BMJ (Clinical research ed.)*, 307(6919), 1584-1586. doi:10.1136/bmj.307.6919.1584
- Sehar, H., Razaq, N., Kanwal, S., Ashraf, M. T., Mumtaz, S., & Tehzeeb, M. (2022). Relationship of superstitious beliefs and self efficacy with the role of education and socio-economic status; A study at Garrison University Lahore Pakistan. *Pakistan Armed Forces Medical Journal*, 72(4), 1258-1261. doi:10.51253/pafmj.v72i4.7063
- Shaikh, M. A., Kakepoto, H., & Khaskheli, M. A. (2025). Socioeconomic and Demographic Factors Influencing Superstitious Beliefs: Evidence From Urban and Rural Populations of Hyderabad, Sindh. *ACADEMIA International Journal for Social Sciences*, 4(3). doi:https://doi.org/10.63056/ACAD.004.03.0796
- Shehzad, A. H. (2025). *Spiritual healers as a barrier to timely mental health access in rural Pakistan: A mini-review*. Department of Psychiatry, Divisional Headquarters & Teaching Hospital Mirpur AJ&K.
- Shrivastav, D. (2018). STUDY ON LOCUS OF CONTROL CONTRIBUTING TO SUPERSTITIOUS BEHAVIOR. 10.29121/granthaalayah.v6.i5.2018.1446. *International Journal of Research - GRANTHAALAYAH*, 6, 244-254. doi:10.29121/granthaalayah.v6.i5.2018.1446
- Solomon, V. A., & Ekong, I. D. (2015). Inclination to Superstitious Knowledge in Decision Making among the Annangs in Farming Communities of Akwa Ibom State, Nigeria. *Current Journal of Applied Science and Technology*, 10(5), 1-11. doi:10.9734/BJAST/2015/19363

- Suyuhan W, Khoso AR, Jintu G and Bhutto S (2026) The mental health crisis in global higher education: understanding and mitigating academic load stress among international students from Asia and Africa in Nanjing China. *Front. Psychol.* 17:1707944. <https://doi.org/10.3389/fpsyg.2026.1707944>
- Tahir, T. B., Qureshi, S. F., & Safi, T. (2018). Superstitions as Behavioral Control in Pakistan. *Pakistan Journal of Social Science*, 38(2), 771-782. Retrieved from <https://pjss.bzu.edu.pk/index.php/pjss/article/view/629>
- Torgler, B. (2003). *It Is About Believing: Superstition and Religiosity*, CREMA Working Paper Series 2003-10, . Basel, Switzerland: Center for Research in Economics, Management and the Arts (CREMA).
- Torgler, B. (2007). Determinants of superstition. *The Journal of Socio-Economics* , 36(5), 713-733. doi:10.1016/j.socec.2007.01.007
- Tylor, E. B. (1871). *Primitive Culture: Researches into the Development of Mythology, Philosophy, Religion, Art, and Custom* (Vol. 1). London: John Murray, Albemarle Street.
- Uwayezu, D., Ntigura, E., Gatarayihya, A., Erem, A. S., Haque, M., Majumder, M. A., & Razzaque, M. S. (2022). Conflict between Science and Superstition in Medical Practices. *International Medical Education*, 1(2), 33-42. doi:10.3390/ime1020007
- Vyse, S. A. (2013). *Believing in Magic: The Psychology of Superstition* (Updated ed.). United Kingdom: Oxford University Press.
- Vyse, S. A. (1997). *Believing in magic : the psychology of superstition*. United Kingdom: Oxford University Press.
- Whitson, J. A., & Galinsky, A. D. (2008). Lacking control increases illusory pattern perception. *Science*, 322(5898), 115-117. doi:10.1126/science.1159845
- Wing, C. K., Ma, V., & Ho, D. C. (2001). The Pricing of 'Luckiness' in the Apartment Market. *Journal of Real Estate Literature*, 9(1), 29-40. doi:1080/10835547.2001.12090095
- Wiseman, R. (2004). *The Luck Factor*. Arrow Books. Retrieved from <http>
- Woo, C.-K., & Kwok, R. H. (1994). Vanity, superstition and auction price. *Economics Letters*, Elsevier, 44(4), 389-395.
- Yıldız, M., Varol, E., Demirhan, A., Yıldırım, M. S., & Solmaz, E. (2023). Determining the level of superstition belief in pregnancy. *Aegean Journal of Obstetrics and Gynecology*, 5(1), 1-4. doi:10.46328/aejog.v5i1.125
- Ying, H., Khoso, A. R., & Bhutto, S. (2024). A Case Study Investigating the Relational Well-Being of International Students at Hohai University Nanjing, Jiangsu Province of China. *Behavioral Sciences*, 14(7), 544. <https://doi.org/10.3390/bs14070544>

