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Psychometric Properties of the Black Magic Belief Scale

Nida Falak Naz[1] · **Naeem Aslam**[1]

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Abstract
This study presents the psychometric properties of the Black Magic Belief Scale, which measured belief in black magic among 290 female and 210 male ($N=500$) Pakistani Muslim adults (17–84 years old, $M=27.43$, $SD=9.42$). Exploratory factor analysis ($N=300$) revealed a six-factor solution with 22 items finalized for BMBS ($\alpha=.82$). The subscales and their internal consistencies are Prevention-Based Beliefs (PB, $\alpha=.74$), Motivation-Based Beliefs (MB, $\alpha=.75$), Knowledge-Based Beliefs (KB, $\alpha=.69$), Attribution-Based Beliefs (AB, $\alpha=.78$), Disbelief (DB, $\alpha=.71$), and Evidence-Based Beliefs (EB, $\alpha=.66$). The scale structure was further confirmed through confirmatory factor analysis ($N=200$). Additional analyses showed some age, gender, and denominational differences in beliefs about black magic. The authors believe the scale has a satisfactory structure and acceptable internal consistency.

Keywords Black magic · Clinical settings · Paranormal beliefs · Supernatural beliefs

Belief in black magic and/or the supernatural is widespread among Muslims. Muslims believe in the existence of black magic (*siḥr or ilm as-siḥr* سحر یا علمِ سحر) due to references in the Holy Qur'an and Hadith (Sayings of Prophet Muhammad) that mention magic (Perho, 2012). Islam acknowledges the existence of magic (*sihr*) in the Qur'an by stating that the devils and two fallen angels, Hārūt and Mārūt, situated in Babylon, were responsible for imparting black magic knowledge to humanity.

> And they followed what the Shaitans chanted of sorcery in the reign of Sulaiman, and Sulaiman was not an unbeliever, but the Shaitans disbelieved, they taught men sorcery and that was sent down to the two angels at Babel, Harut and Marut, yet these two taught no man until they had said, "Surely we are only a trial, therefore do not be a disbeliever." (The Qur'an 2:102).

The two angels were believed to be punished for this act, and many were believed to hang upside down in a cave (Burge, 2021). Likewise, the last two chapters of the Qur'an,

✉ Nida Falak Naz
naznazawan@gmail.com

Naeem Aslam
naeemaslam@nip.edu.pk

[1] National Institute of Psychology, Islamabad, Pakistan

collectively called verses of the refuge, contain God's command to flee to God for protection from the wickedness of witches who cast curses by blowing on knots:

> "Say, "I seek refuge in the Lord of daybreak. From the evil of that which He created. And from the evil of darkness when it settles. And from the evil of the blowers in knots. And from the evil of an envier when he envies." (The Qur'an 113:4)

Magic worked on Prophet Muhammad (ﷺ); narrated by Aisha, the Prophet had a dream that Lubaid bin al-A'sam bewitched him by using "a comb, entangled hair on it, and the outer skin of the pollen of the male date-palm" (Sahih al-Bukhari 54:490; Sahih al-Muslim 2189).

While Islam acknowledges the existence of black magic, it unequivocally prohibits its practice in all its manifestations (Aleem et al., 2021). Certain Muslim scholars from both earlier and later periods have raised doubts about the validity of sorcery and witchcraft within Islamic teachings, characterizing them as forms of deceit, illusion, and falsehood. On the other hand, some scholars have classified various 'magical practices' as those deemed permissible and those strictly forbidden (Burge, 2021). The Islamic scriptures and texts addressing black magic often lack specificity, leading to differing viewpoints among Muslim philosophers regarding how to address this subject (Kamali, 2011).

Black magic is defined as the use of wicked spirits to cause catastrophic things (Black magic, 2013); it consists of skills that can be spiritual, divinatory, or mystic and encompasses practices and capabilities that affect the mind, body, and property in a spiteful way (Illes, 2010). The term "black magic" frequently refers to evil acts, which mean different things to different people (Mohyuddin & Rehman, 2015). For instance, black magic can mean a state when anxiety arises due to misfortune, harm, accusation, blame, risk, and responsibility (Moro, 2018). Alternatively, it can be a belief that provides explanations for events such as illness, death, or misfortune (Chaudhry & Rafi, 2012). Or, the belief in black magic is not problematic, but what it causes in others can be physical, psychological, and emotionally abusive (DiGregorio, 2013). People use black magic to control their lives and engage in sensation-seeking behavior (Eisenbarth et al. (2015); they hope to improve their health, obtain money, raise their socioeconomic status or power, and resolve family conflicts (Hayes, 2019; Saudagar & Khalid, 2015). Black magic can also be used in passive-aggressive ways to let out one's anger and frustration on others (Connolly, 2011). While conducting a study on Satanic syndrome and depression, those that used black magic were rebellious and were compensating for their feelings of powerlessness (Sram, 2017). In some countries, such as Pakistan, people visit shrines and other holy sites to ward off evil and receive treatment for mental disorders from the spiritual ambiance of the place (Abbo et al., 2009; Levin, 2008; Shaikh et al., 2010).

A survey on Muslim communities by the Pew Research Center (2012) revealed that 35% of South Asians and Sub-Saharan Africans believe in witchcraft and 26% of Middle East/North Africans believe in sorcery. Muslims in the Middle East and North Africa exhibit a similar spectrum of opinions, with more than three-quarters of Muslims believing in witchcraft in Tunisia (89%) and Morocco (78%), 16% in Egypt, and 14% in the Palestinian territories. Furthermore, 31% of Southern-Eastern Europeans, 21% of Central Asians, 49% of Southeast Asians, and 50% of Pakistani Muslims are believers in black magic.

The widespread belief in black magic led the Saudi government to establish a witchcraft section to address witchcraft practices, and it even beheaded a woman in 2011 on charges of witchcraft (Perlmutter, 2013). He further stated that 150 Afghan women had been imprisoned on grounds linked to witchcraft. According to the International Religious Freedom Report (2019), the Saudi government has jailed and convicted a significant number of persons on the charge of black magic. Also, black magic allegations against children

have become the focus of increased international attention in recent years (Bussien et al., 2011; Garcia, 2013). Forsyth (2016) highlighted that beliefs and practices in black magic generated a wide range of law and order– and development-related problems in many parts of the world. The most visible of these are violent exorcisms, banishment, torture, and killings inflicted upon those accused of practicing sorcery and witchcraft in many parts of the world (Qiliang, 2009).

It is necessary to study the belief in black magic among Muslims and other communities because when people believe in black magic they are more likely to believe in related paranormal beliefs such as the evil eye, jinn possession, black magicians who can practice black magic and cast evil spells, spiritual healers who can ward off evil spells and/or carry out exorcisms, amulets and artifacts that can protect individuals from evil spells, etc. In one study, Muslims from Leicester (UK) who believed in black magic, jinn possession, and the evil eye were found to be at risk of attributing mental and physical health problems to supernatural entities (Khalifa et al., 2011). Other researchers also reported the association between paranormal beliefs and mental disorders (Grover et al., 2014; Nie & Olson, 2016; Sapkota et al., 2016). Likewise, when people believe in black magic, they are more likely to attribute negative outcomes to it. In Pakistan, people attribute regular day-to-day misfortunes, minor accidents, and even mental and physical health problems to black magic (Aslam, 2017).

Many researchers argue that beliefs associated with black magic in clinical settings are important and can help mental health professionals with the diagnosis and management of mental ailments (Anna Rosa, 2018; Gadit, 2011; Kate et al., 2012). People typically seek black magic practitioners for mental health issues such as panic attacks, anxiety, depressive symptoms, and bipolar disorder (Farooqi, 2006; Qidwai, 2003). Although a recent study (Batool, 2016) questions and debunks such beliefs and argues that these are misunderstandings among ordinary Muslims who are poorly educated, such beliefs cannot be ignored for they have clinical, developmental, and sociopsychological underpinnings (Mathijsen, 2009). In this regard, it appears relevant to understand better where persons stand concerning the set of beliefs surrounding the paranormal sphere, which may become operative when they have to deal with issues related to health, thus influencing their coping strategies, outcome expectancies, and display of harmful behaviors. Moreover, measuring beliefs about black magic in Muslims and other groups is also important to assess the depth and prevalence of these beliefs.

Despite these needs, to date only a handful of studies have investigated beliefs in black magic. For example, the most widely used measures of paranormal beliefs, the Paranormal Belief Scale (PBS; Tobacyk & Milford, 1983) and the Revised Paranormal Belief Scale (RPBS; Tobacyk, 1988, 2004), measure beliefs about witchcraft as a subscale, using only four items for this purpose. However, the belief in black magic, which is essentially a multifaceted concept whose interpretation may differ slightly from culture to culture, cannot be sufficiently captured by just four items. Additionally, these scales have not been without criticism (Drinkwater et al., 2017). Tobacyk (2004) himself claimed that many items of his scale are unfamiliar in certain cultures, such as those of Germany, Finland, and Poland, and noted that he had even changed his subscale on witchcraft to boost its cross-cultural validity. The earlier version, the PBS, resulted in weak reliability and a lower average response on the rating scale in Europe, which was improved in the RPBS by modifying two items on this subscale. Another issue associated with this widely used scale to measure paranormal beliefs is that it classifies religious beliefs as paranormal beliefs, although the Muslim population does not do so. It has been suggested that the four religious paranormal belief items (items 1, 8, 15, and 22) on the RPBS should be removed from the scale's overall score

(Williams et al., 2009) as they emphasize themes that are a fundamental part of a Muslim's religious belief system. Indeed, these scales do not measure the depth and breadth of paranormal beliefs.

Very few studies, however, go beyond these frequently used scales. Black magic belief is merely one subset of the various dimensions that make up paranormal beliefs, and it should be investigated by researchers as it might offer new insights and viewpoints on paranormal beliefs. Since previous scales do not measure beliefs about black magic exclusively, it is critical to have an instrument that measures belief in black magic and illuminates different aspects of such beliefs among Muslims. We developed a psychometrically sound instrument that measures belief in black magic among Pakistani Muslim adults. This instrument will help other researchers in the fields of religion and cross-cultural and social psychology to assess the prevalence of these beliefs among Muslims and other groups.

Method

Sample

A convenience sample of 290 Muslim women and 210 men ($N=500$) with an age range of 17–84 ($M=28.74$, $SD=9.73$) were the participants. All participants or their parents provided informed consent. The participants came from different educational backgrounds. For example, a minority of the participants had completed matriculation i.e., 10th grade (10.4%); a larger percentage had completed college (intermediate, 24.0%) or were graduates (bachelor's degree, 43.4%) or had completed postgraduate studies (master's degree or above, 21.0%). The sample was also divided into different Islamic denominations; for example, a large majority (44.8%) of the participants were Ahle Sunnat, 16.6% were Ahle Hadith, 16.2% were Ahle Sunnat Barelvi, 11.2% were Ahle Sunnat Deoband, and 11.0% were Ahle Tasheeho. The study included only Muslims, not people from other faiths.

Instrument

Development of the black magic belief scale (BMBS) The initial version of the BMBS comprised 72 items (item pool) that were based on interviews with many Pakistani Muslims about black magic beliefs and associated aspects. For example, early items before modifications were, "Eating yellow-colored things can cause black magic" or "The sacrifice of humans before demons are required for the rituals of black magic." To design and develop the BMBS, seven subject matter experts (see Lynn, 1986) were used. Five of these were scale construction specialists and two were language specialists that provided background information on writing items about black magic. The authors asked the language specialists to evaluate the statements for relevance, clarity, and redundancy. These specialists screened and removed or modified 41 items, leaving 31 items for further analysis. Originally developed in Urdu, the statements were translated by linguistic experts for international audiences. An exploratory factor analysis was carried out on the scale for its factor structure and dimensionality on a convenience sample of 150 women and 150 men ($N=300$), discarding nine items after the analysis (See the Results section for more details). A confirmatory factor analysis was run on 22 items of the BMBS using AMOS, version 22 (Arbuckle, 2013), and six factors or subscales were identified. Age, gender, and denominational differences in beliefs about black magic were analyzed with IBM SPSS Statistics (version 20).

The final version of the BMBS had 22 items (three reverse-scored items) and six subscales. Each item was rated on a 5-point Likert scale ranging from *strongly disagree* (1) to *strongly agree* (5). Composite scores on the BMBS ranged from 22 to 110, where high scores represented stronger belief in black magic. The six subscales were Prevention-Based Beliefs (PB; 4 items, composite score range: 4–20), Motivation-Based Beliefs (MB; 4 items, composite score range: 4–20), Knowledge-Based Beliefs (KB; 4 items, composite score range: 4–20), Attribution-Based Beliefs (AB; 4 items, composite score range: 4–20), Disbelief (DB; 3 items, composite score range: 3–15), and Evidence-Based Beliefs (EB; 3 items, composite score range: 3–15). For information on internal consistency, see the Results section.

Demographic sheet The demographic sheet was next to the informed consent in the booklet the participants received. Age, gender, income, education, and sect were some of the questions that were asked. Participants were reluctant to reveal details about their income, so this data was excluded from the final analysis.

Procedure

Approval for the current study was obtained from the ethical committee at the National Institute of Psychology, Pakistan. Participants were told about the purpose of the study and were told their participation was completely voluntary; they were informed about their right to withdraw at any time without penalty. They were assured that their personal information and responses would be kept confidential and anonymous and were guaranteed that their responses would only be used for research purposes. If they were willing to participate, they were asked to sign a consent form, and if they were less than 18, parental consent was obtained. Moreover, they were asked to read and follow the instructions before completing the scale. A majority of the participants had a deep interest in black magic. It took 10 min for the participants to complete the scale and provide their demographic information.

Data analysis

Data were analyzed in four steps. First, the seven subject matter experts evaluated the content validity of the scale. They were provided with background information and the definition of the construct and were asked to evaluate the statements for redundancy and lack of clarity. In the second step, selected items were subjected to exploratory factor analysis for the exploration of their dimensionality. The sample consisted of 300 adults—women ($n=150$) and men ($n=150$)—with an age range of 17–84 ($M=28.18$, $SD=10.08$). An exploratory factor analysis was run using principal axis factoring, which is one of the most commonly used methods (see Russell, 2002). For factor rotation, promax rotation was used because it is simple and allows for the correlation of factors, and it also can provide a good solution and generates the most replicable results than direct oblimin rotation (Abdi, 2003; Finch, 2006). After this, internal consistencies for the subscales and the whole scale were calculated with the help of Cronbach's alpha. For the exploratory factor analysis and Cronbach's alpha, data were analyzed with IBM SPSS (version 20). Subsequently, a confirmatory factor analysis was run through AMOS (version 22) to validate the BMBS. For this purpose, data were collected from 200 individuals. Of these, 87 (43.55%) were male and 113 (56.5%) were female. Their ages ranged from 18 to 67 ($M=26.53$, $SD=7.70$). Lastly, age, gender, and denominational differences in black magic beliefs were analyzed with SPSS, version 20 (IBM Corp, 2020).

Results

The Kaiser-Meyers-Olkin test (KMO = .88) measured sampling adequacy for the BMBS (31 items) and found it was high enough (Cerny & Kaiser, 1977) to carry out factor analysis. In addition, the *p*-value for Bartlett's test of sphericity was significant ($\chi^2 = 3196.13$; $df = 465$, $p < .000$) and the correlation matrix was not like the identity matrix. Therefore, the dataset was deemed suitable for factor reduction (see Garson, 2008). An exploratory factor analysis was carried out on the scale for its factor structure and dimensionality on a convenience sample of 300 adults, where the data of 300 is considered adequate for exploratory factor analyses (see Comrey & Lee, 1992; Hutcheson & Sofroniou, 1999; Norusis, 2005). Factor structure and internal consistencies (Cronbach's alpha) were analyzed with IBM SPSS Statistics (version 20).

The initial solution extracted eight factors (eigenvalue > 1; Kaiser, 1960) and explained 62% of the total variance. However, a closer look at the scree plot (Cattell, 1966) suggested the existence of six factors; the scree curve leveled off after the sixth factor. Cross-loaded items and items with factor loading below.3 (see Costello & Osborne, 2005) were discarded. Moreover, items that loaded on dimensions contradictory to what they measured were also discarded. As a result, nine items were discarded before the final items were selected for the BMBS. Based on the evidence, a model with six factors was specified, with four indicators or items for the first four factors, PB, MB, KB, and AB, and three indicators or items for the last two factors, DB and EB. The first factor, PB, accounted for 28.40% of the variance, with moderate internal consistency (α = .74); the second factor, MB, accounted for 8.76% of the variance, with moderate internal consistency (α = .69); the third factor, KB, accounted for 5.36% of the variance, with low to moderate internal consistency (α = .75); the fourth factor, AB, accounted for 4.58% of the variance, with moderate internal consistency (α = .79), the fifth factor, DB, accounted for 4.57% of the variance, with moderate internal consistency (α = .71); and the sixth factor, EB, accounted for 3.64% of the variance, with moderate internal consistency (α = .72). Analysis revealed that factor loadings ranged from .31 to .96, and item-total correlation was between -.14*-67**. The score ranges and mean response scores for the BMBS (total) ranged from 22 to 10 ($M = 64.65$, $SD = 13.08$). For factor PB, the scores ranged from 4 to 20 ($M = 9.95$, $SD = 4.03$), for factor MB from 4 to 20 ($M = 13.42$, $SD = 3.88$), for factor KB from 4 to 20 ($M = 14.47.$, $SD = 3.34$), for factor AB from 4 to 20 ($M = 10.59$, $SD = 4.07$), for factor DB from 3 to 15 ($M = 10.90$, $SD = 3.04$), and for factor EB from 3 to 15 ($M = 9.15$, $SD = 3.30$).

A confirmatory factor analysis was run on 22 items to validate the BMBS through AMOS, version 22 (Arbuckle, 2013). For this purpose, data from 87 (~44%) Muslim men and 113 (~56%) women ($N = 200$) were used. Their ages varied from 18 to 67 (M = 26.53, SD = 7.70). Since Chi-square is sensitive to sample size (Bollen, 1989), goodness of model fit was also evaluated by using alternative indices, which included the root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker-Lewis Index (TLI), and incremental fit index (IFI). For the current model, results confirm the existence of six factors: $\chi^2/df = 1.89$; IFI = .96; TFI = .96; CFI = .96; RMSEA = .06; all values fall within the acceptable range (see Browne & Cudeck, 1993; Hooper et al., 2008; Hu & Bentler, 1999; Schreiber et al., 2006) (Table 1).

Table 2 displays the correlations between the BMBS and its subscales, aiming to provide a deeper understanding of their relationships. The total BMBS score was found to have a significant association with PB ($r = .75$, $p < .01$). This same pattern of association was observed for the subscales as well: MB ($r = .74$, $p < .01$), KB ($r = .67$, $p < .01$), AB

Table 1 Factor loadings and psychometric properties of the black magic belief scale

Statements in Urdu	Statements in English	*r*	*M*	*SD*	*Sk*	Factor Loading	Item-Total Correlation
احتیاطی تدابیر پر مبنی عقائد	Prevention-Based Beliefs	.74					
میں اپنی تصویروں کو سنبھال کے رکھتاارکھتی ہوں کیونکہ ان کا کالے جادو میں استعمال ہو سکتا ہے۔	I keep my pictures to myself because they can be used in black magic		2.60	1.36	.40	.77	.61**
میں اپنے بالوں اور ناخنوں کو محفوظ مقام پر پھنکتاپھنکتی ہوں کیونکہ ان کے ذریعے مجھ پہ کالا جادو ہو سکتا ہے۔	I put my hair and nail clippings in a safe place because they can be used to cast spell on me		2.93	1.43	.00	.66	.57**
میں نے کالے جادو سے بچنے کے لیے گھر پر کالا تیتراچکور رکھا ہے یا رکھنے کا فیصلہ کیا ہے۔	I have decided to keep a partridge in my home to avoid black magic		2.44	1.34	.52	.65	.54**
میں کسی بھی ایسے شخص سے جو کہ میرا دشمن ہو کچھ بھی لے کے نہیں کھاتاکھاتی۔	I do not eat anything from anyone who is my enemy		2.03	1.20	1.06	.41	.35**
محرکات پر مبنی عقائد	Motivation-Based Beliefs	.75					
مقابلہ بازی کی فضا انسان کو کالا جادو کی طرف لے جاتی ہے۔	The atmosphere of competition leads a person to do black magic		3.26	1.28	-.31	.88	.63**
میں سمجھتا ہوں کہ جائیداد ہتھیانے کے لیے بھی جادو کا استعمال ہوتا ہے۔	I believe black magic is used to steal property		3.56	1.31	-.75	.70	.53**
میرا ماننا ہے کہ حسد اور جلن جادو کے دو اہم محرکات ہیں	I believe that jealousy and envy are two main motives of black magic		3.25	1.25	-.20	.54	.55**
میرا یقین ہے کہ کالا جادو میاں بیوی میں جدا ئی ڈالنے کےلیے استعمال ہوتا ہے۔	I believe that black magic is used to separate spouses		3.32	1.26	-.39	.43	.50**
سوجھ بوجھ پر مبنی عقائد	Knowledge-Based Beliefs	.69					
کالا جادودرحقیقت ایک کالا علم ہے جو کہ ناقابل حصول مقاصد کے لیے استعمال ہوتا ہے۔	Black magic is black knowledge that is used for attainable purposes		3.96	1.23	-1.24	.71	.41**

Table 1 (continued)

Statements in Urdu	Statements in English	*r*	*M*	*SD*	*Sk*	Factor Loading	Item-Total Correlation
کالے جادو کا بنیادی مقصد کسی بھی چیز کو غیر فطری طریقے سے حاصل کرنا ہے۔	The main purpose of black magic is to obtain things in unusual ways		3.97	1.07	-1.03	.63	.37**
کالے جادو کی ایک مقررہ مدت ہوتی ہے جس میں اس کا توڑ کرنا ضروری ہوتا ہے۔	There is a fixed period of black magic during which it is necessary to break the spell		3.15	1.17	-.22	.57	.37**
میرا ماننا ہے کہ کالا جادو کرنے کے لیے انسان کو اپنی من پسند چیز کی قربانی دینی پڑتی ہے۔	I believe that to practice black magic, a person has to sacrifice what they like		3.41	1.18	-.36	.53	.46**
اسباب پر مبنی عقائد	Attribution-Based Beliefs	.78					
مجھے لگتا ہے کہ اکثر ہمارے گھروں میں تنازعات کی ایک ممکنہ وجہ کالا جادو ہوتا ہے۔	I believe black magic is often a possible cause of conflict in our homes		2.60	1.36	.38	.96	.60**
میں سمجھتا\سمجھتی ہوں کہ دماغی بیماریاں درحقیقت کالا جادوکی وجہ سے ہوتی ہیں۔	I believe mental illnesses are caused by black magic		2.33	1.28	.69	.74	.58**
شادی یا رشتہ ٹوٹنے کی ایک ممکنہ وجہ کالا جادو ہو سکتا ہے۔	One of the possible causes of a separation or breakup can be black magic		2.66	1.27	.28	.60	.65**
اگر میں بیمار ہو جاوں اور ڈاکٹر میری بیماری کا تعین نہ کر سکیں تو میرا شک کالے جادو کی طرف جائے گا۔	If I get sick and the doctors can't diagnose my illness, my suspicion will turn to black magic		2.99	1.26	.35-.08	.31	.67**
بے اعتباری	Disbelief	.71					
میں سمجھتا\سمجھتی ہوں کہ کالے جادو کی کوئی حقیقت نہیں۔	I think there is no such thing as black magic		2.61	1.31	.47	-.75	.07
میں کالے جادو کے اثرات پر یقین نہیں رکھتا۔	I don't believe in the effects of black magic		2.19	1.24	.90	-.69	-.14*
میرا ماننا ہے کہ کالا جادو محض توہم پرستی ہے۔	I believe that black magic is just a superstition		2.32	1.25	.78	-.60	-.11

Table 1 (continued)

Statements in Urdu	Statements in English	*r*	*M*	*SD*	*Sk*	Factor Loading	Item-Total Correlation
دلیل پر مبنی عقائد	Evidence-Based Belief	.66					
اگر کاروبار میں مسلسل نقصان ہو رہا ہو توکالے جادوکا حساب کروا کے بھی تسلی کر لینی چاہیے۔	If a business is constantly operating at a loss, one seek a spiritual diagnosis of black magic		2.95	1.36	-.07	.62	.67**
گھر سے تعویزات یا سوئیاں لگ گھرانے پتلوں کا نکلنا علامت ہے کہ اس پر کالا جادو ہوا ہے۔	Finding amulets or voodoo dolls in the house is a sign that black magic has befallen the family		2.79	1.44	.11	.59	.64**
اگر کبھی میرے کپڑوں پر خون کے دھبے لگیں یا میرے کپڑے بلاوجہ پھٹ جائیں تو میں فورا کسی عامل یا مولانا سے رابطہ کروں گا۔	If I ever get bloodstains on my clothes or my clothes get torn for no reason, I will immediately contact Amil or Maulana, a faith healer		3.45	1.29	.19	.43	.62**

M Mean, *SD* standard deviation, *Sk* skewness

** $p < .01$

Table 2 Intercorrelation, means, and standard deviations for composite scores for the black magic belief scale and its subscales

Scales	*M*	*SD*	PB	MB	KB	AB	DB	EB	BMBS (Total)
PB	12.29	4.93	-	.39**	.33**	.45**	.35**	.54**	.75**
MB	13.89	3.89		-	.47**	.47**	.39**	.50**	.74**
KB	15.12	3.43			-	.37**	.40**	.40**	.67**
AB	11.41	4.39				-	.23**	.48**	.73**
DB	11.36	3.07					-	.29**	.59**
EB	10.14	3.39						-	.75**
BMBS(Total)	74.52	16.57							-

PB prevention-based beliefs, *MB* motivation-based beliefs, *KB* knowledge-based beliefs, *AB* attribution-based beliefs, *DB* disbelief, *AB* attribution-based beliefs, *BMBS* Black Magic Belief Scale

** $p < .01$

($r = .73$, $p < .01$), AB ($r = .59$, $p < .01$), and EB ($r = .75$, $p < .01$). This table depicts the mean and standard deviations pertaining to composite scores for individuals who exhibited an above-average inclination to believe in the concept of black magic within the current study sample.

Table 3 illustrates noteworthy gender differences in the BMBS and its subscales. The mean values indicate that women ($M = 77.46$, $SD = 14.80$) tend to achieve higher scores on the BMBS and its subscales. Additionally, across the subscales of PB ($M = 13.01.$, $SD = 4.82$), MB ($M = 14.65.$, $SD = 3.56$), KB ($M = 15.63$, $SD = 3.12$), AB ($M = 11.56.$, $SD = 4.39$), DB ($M = 11.68$, $SD = 2.83$), and EB ($M = 10.77$, $SD = 3.16$), women consistently show stronger belief levels compared to men.

Table 4 shows the results of a one-way ANOVA that compared the effects of different age groups on belief in black magic. The results revealed significant mean differences only for PB, AB, EB, and the BMBS. The post hoc analysis for PB [F (4, 490) = 2.66, $p < 0.05$, $\eta^2 = 0.1$], AB [$F(5, 490) = 3.21.$, $p < 0.05$, $\eta^2 = 0.1$] and EB [$F(5, 488) = 2.75$, $p < 0.05$, $\eta^2 = 0.1$] showed significant mean differences only for two age group (i.e., between ages

Table 3 Mean and Standard Deviations of the Black Magic Belief Scale as a Function of Gender

	Men ($n = 210$)		Women ($n = 290$)			95% CI			
Scales	*M*	*SD*	*M*	*SD*	*t*	*p*	*LL*	*UL*	*d*
PB	11.29	4.92	13.01	4.82	−3.88	.00	−2.59	−.85	0.3
MB	12.83	4.08	14.65	3.56	−5.21	.00	−2.50	−1.13	0.4
KB	14.42	3.70	15.63	3.12	−3.90	.00	−1.80	−.59	0.3
AB	11.21	4.40	11.56	4.39	−.87	.38	−1.13	.43	-
DB	10.89	3.33	11.68	2.83	−2.84	.00	−1.34	−.24	0.4
EB	9.27	3.51	10.77	3.16	−4.95	.00	−2.09	−.90	0.4
BMBS (Total)	70.24	18.06	77.46	14.80	−4.74	.00	−10.20	−4.22	0.4

PB prevention-based belief, *MB* motivation-based beliefs, *KB* knowledge-based beliefs, *AB* attribution-based beliefs, *DB* disbelief, *AB*attribution-based beliefs, *BMBS* Black Magic Belief Scale *M* mean, *SD* standard deviation, *CI* confidence interval, *LL* lower limit, *UL* upper limit

Table 4 Mean and Standard Deviations of the Black Magic Belief Scale as a Function of Age

	Age 17–24 ($n=235$)		Age 25–34 ($n=154$)		Age 35–44 ($n=64$)		Age 45–54 ($n=32$)		Age 55–64 ($n=13$)		Age 65 & above ($n=2$)					
Scales	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	*η2*	Tukey's Post Hoc
PB	11.68	4.68	12.46	5.19	14.00	4.79	12.56	5.11	11.69	4.93	16.50	2.12	2.66	.02	0.1	2 > 1, 3 > 2, 4 > 2, 4 > 5, 6 > 5
MB	13.71	3.91	13.71	3.86	14.89	3.58	14.40	3.60	13.25	5.69	13.50	3.53	1.18	.31	-	-
KB	14.95	3.60	15.14	2.84	15.92	3.55	15.09	3.89	14.23	4.72	14.00	1.41	1.00	.41	-	-
AB	11.42	4.56	10.73	4.04	13.21	4.16	11.62	4.66	10.15	3.91	10.22	4.24	3.21	.00	0.1	2 > 1, 3 > 2, 2 > 4, 4 > 5, 5 > 6
DB	11.09	3.19	11.56	2.89	12.03	2.72	10.96	3.03	11.00	4.08	15.00	.00	1.80	.11	-	-
EB	9.83	3.33	10.13	3.68	11.53	2.58	9.59	3.40	10.30	3.30	10.50	2.12	2.75	.01	0.1	2 > 1, 3 > 2, 2 > 4, 5 > 2, 3 > 6
BMBS (Total)	73.20	17.04	73.61	15.63	81.90	14.59	74.25	17.79	71.91	19.24	79.50	9.91	2.93	.01	0.1	2 > 1, 3 > 2, 4 > 5, 2 > 5, 6 > 4

PB prevention-based beliefs, *MB* motivation-based beliefs, *KB* knowledge-based beliefs, *AB* attribution-based beliefs, *DB* disbelief, *AB* attribution-based beliefs, *BMBS* Black Magic Belief Scale, *M* mean, *SD* standard deviation, *F* ratio of between group variation and within group variation, *η2* measure of effect size

17 and 24 and ages 35 and 44). However, the post hoc analysis for BMBS total [$F(5, 464) = 2.93$, $p < 0.05$, $\eta^2 = 0.1$] showed significant differences between the 17–24 and 35–55 age groups as well as between the 24–34 and 35–44 age groups.

Table 5 shows the results of a one-way ANOVA that compared the effects of different denominations' affiliations on belief in black magic. Results revealed significant mean differences in all subscales except MB and DB. The post hoc analysis for PB [$F(4, 490) = 9.45$, $p < 0.05$, $\eta^2 = 0.2$] revealed significant differences between three groups, i.e., between *Ahle* Sunnat and Ahle Sunnat Barelv and between Ahle Sunnat and Ahle Hadith and Ahle Tasheeho. The post hoc analysis for KB [$F(4, 488) = 1.73$, $p < 0.05$, $\eta^2 = 0.1$] revealed significant differences between Ahle Sunnat and Ahle Tasheeho, between Ahle Sunnat Deobandi and Ahle Tasheeho, and between Ahle Sunnat Barelvi and Ahle Tasheeho. The post hoc analysis for AB [$F(4, 488) = 2.61$, $p < 0.05$, $\eta^2 = 0.1$] and EB [$F(4, 488) = 6.21$, $p < 0.05$, $\eta^2 = 0.0$] revealed significant differences between only two groups, i.e., between Ahle Sunnat and Ahle Tasheeho. The post hoc analysis for the BMBS [$F(4, 465) = 6.52$, $p < 0.05$, $\eta^2 = 0.2$] revealed notable variations between Ahle Sunnat and Ahle Hadees and between Ahle Sunnat and Ahle Tasheeho.

Discussion

The above analysis demonstrates that the BMBS is a psychometrically sound instrument that measures belief in black magic and various aspects that surround this belief with good reliability. The six-factor model confirmed for the BMBS showed a good fit, demonstrated good internal consistency (see Hulin et al., 2001), and good inter-item correlations (see BrckaLorenz et al., 2013), signifying internal validity. Previous instruments, such as the PBS (Tobacyk & Milford, 1983) and RPBS (Tobacyk, 1988, 2004), do measure beliefs about witchcraft (a subscale) but with only four items that do not cover many aspects of black magic observed in many cultures. To address this, we developed a comprehensive instrument that measures these aspects because belief in black magic has cultural and historical significance in many societies (Bhattacharjya et al., 2021; Gnanaolivu et al., 2022) and is passed down as a part of their cultural legacy where people hold these convictions to protect their cultural identity and sense of community. Using the BMBS to explore these beliefs should provide a deeper understanding of the values, fears, and aspirations of a community, which would enable us to understand how people form and maintain beliefs.

Understanding beliefs about black magic is important. In recent years, the practice of black magic has generated a wide range of problems for law enforcement in many parts of the world (Forsyth, 2016). In cases where black magic is the root cause of emotional and mental problems (Grover et al., 2014; Nie & Olson, 2016; Rabeyron & Watt, 2010) and patients attribute their symptoms to supernatural causes (Graham & White, 2015), diagnosis and treatment of such patients requires an understanding of their black magic beliefs.

Researchers have suggested a wide range of beliefs associated with black magic (Ezzy, 2006; Hayes, 2019; Mohyuddin & Rehman, 2015; Saudagar & Khalid, 2015; Vanderheyden, 2012). A factorial reduction of the BMBS covered six different aspects of beliefs associated with black magic. For example, the scale includes statements that represent preventive beliefs about black magic through which individuals try to protect themselves from black magic by keeping personal photographs safe, burning hair and nail clippings, etc. The second kind of beliefs tapped by the scale are motivation-based beliefs where people are motivated to hurt others using black magic. These motives can be

Table 5 Mean and Standard Deviations of the Black Magic Belief Scale as a Function of Denomination

	Ahle Sunnat (n = 224)		Ahle-Sunnat Deoband (n = 56)		Ahle Sunnat Barelvi (n = 81)		Ahle Hadith (n = 83)		Ahle Tasheeho (n = 55)					
Scales	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2	Tukey's Post Hoc
PB	13.72	5.10	12.10	4.78	11.17	4.47	10.69	4.05	11.00	4.71	9.45	.00	0.2	1 > 2, 1 > 3, 1 > 4, 1 > 5
MB	14.14	3.88	13.75	3.63	14.36	3.60	13.73	3.81	12.75	4.46	1.73	.14	-	-
KB	15.51	3.38	15.30	3.43	15.42	2.90	14.77	3.11	13.40	4.24	4.61	.00	0.1	1 > 5, 2 > 5, 3 > 5, 4 > 5
AB	11.99	4.45	11.34	4.52	11.30	4.40	11.02	4.00	9.98	4.35	2.61	.03	0.1	1 > 5, 2 > 3, 3 > 4, 4 > 5
DB	11.46	3.18	11.48	2.90	11.57	2.35	11.20	3.01	10.74	3.75	.78	.53	-	-
EB	10.87	3.24	9.64	3.47	9.98	3.29	9.75	3.24	8.61	3.60	6.21	.00	0.0	1 > 5, 3 > 2, 3 > 4, 4 > 5
BMBS (Total)	78.00	16.93	73.51	16.05	74.10	13.24	71.54	14.65	66.35	18.96	6.52	.00	0.2	1 > 4, 1 > 5, 3 > 4, 4 > 5

PB prevention-based beliefs, *MB* motivation-based beliefs, *KB* knowledge-based beliefs, *AB* attribution-based beliefs, *DB* disbelief, *AB* attribution-based beliefs, *BMBS* Black Magic Belief Scale, *M* mean, *SD* standard deviation, *F* ratio of between group variation and within group variation, η^2 measure of effect size

driven by emotions such as jealousy or envy to separate married couples, etc. A third factor that emerged from the BMBS was knowledge-based beliefs—beliefs held by respondents academically versus beliefs held by someone who has had real experience with black magic. This factor could associate strongly with the fifth factor, disbelief in black magic (no analysis carried out), because those that believe in black magic academically may not believe it actually exists. A fourth kind of belief, attributional beliefs, consists of statements that illnesses, mental disorders, business losses, and family conflicts are due to black magic; a number of studies have confirmed these beliefs (Ae-Ngibise et al., 2010; Joshi et al., 2006; Sinha, 2007). The fifth factor, disbelief in black magic, was measured by three reverse-coded items to validate the respondent's position in terms of believing in black magic or not. Finally, the last factor is evidence-based beliefs about black magic; this subscale consists of items where respondents agreed that voodoo dolls, blood stains, small holes in clothes, amulets, etc., are indicators or artifacts of black magic (see Jacob, 2019; Jenkins, 2014).

Beliefs about black magic are prevalent in all age groups, but in our data mature adults (35–44 years) had a higher belief in black magic compared to other groups. A possible explanation could be that mature adults have reached a point in their life where they have gathered more personal experiences involving inexplicable phenomena related to their successes and failures that have led them to consider explanations other than those that are ordinarily accepted. Moreover, professional and personal life pressures experienced by such adults increase their receptivity to ideas about black magic, which may provide answers, solace, control, and comfort not easily found in day-to-day life.

Significant gender differences were also observed. Women had higher belief in black magic than men, which aligns with previous studies (Auton et al., 2003; Utinans et al., 2015; Zebb & Moore, 2003). This might be because women are socialized differently than men; they learn to value emotions over logic, intuition over rationality, and supernatural explanations over scientific ones. Women typically have a greater external locus of control than men (Mohanty, 2021), which can increase their belief in magic and answers that relieve their stress and reduce their anxiety during uncertain times. All five denominations believed in black magic (mean BMBS score: ~ 73); Ahle Sunnat had the highest levels of beliefs and Alle Tasheeho the lowest (see Table 5). Although there were significant differences across these denominations, these differences pertain to the sample we collected, which could not be easily generalized for a larger cross-cultural group. Furthermore, we observed that many nonsectarian individuals called themselves Ahle Sunnat and were not very clear about their denomination.

The mean score of the BMBS data ranged from 72.70 (denomination) to 75.73 (age), with gender (73.90) in between these two. These means were about two points higher than the mean (70.24) of the BMBS range (22–110). Similarly, mean scores for the PB (12.29), MB (13.89), KB (15.12), AB (11.41), DB (11.36) and EB (10.14) subscales were moderately high, suggesting the participants had moderate levels of belief in black magic and other aspects of black magic, with considerable individual variation. As expected, some contradictory data was revealed; some respondents scored higher on believing in one aspects of black magic and yet expressed a high score on disbelief in black magic at the same time. We believe this may be due to cognitive dissonance, ambivalence, or just general skepticism about black magic if the respondent had no personal experience with black magic to validate it. In addition, high levels of stress can strengthen belief in black magic (Lasikiewicz, 2016) when one's sense of rationality is shaken.

Moderate levels of beliefs about black magic can be attributed to the religious convictions of Muslims in our sample, possibly because Islamic texts do not provide extensive details about black magic (Kamali, 2011). For example, Mutazili theology considers black magic not real (Zadeh, 2014). It is not a fundamental requirement for Muslims to preserve black magic beliefs, which may have resulted from a blend of pre-Islamic and Islamic traditions. Nevertheless, the Qur'an and Hadiths rightly prohibit the use of magic and witchcraft in any form (Rassool, 2018). Believers are cautioned against the inherent risk of blasphemy if they engage in magical practices to avoid severing their connection with Allah and risking their salvation (Kamali, 2011) or becoming enemies of the Prophet (ﷺ) (Perho, 2012).

Limitations and suggestions for future research

Some limitations of the study are worth noting. First, the convenience sample obtained for this study is not representative of the wider Pakistani population because it is drawn from primarily well-educated individuals who are more secular in their ways, believing in black magic less than those that are less educated. Another limitation of the study stems from the fact that our sample was exclusively comprised of Muslims and not individuals of other faiths. Additionally, the strength of religiosity of these Muslims was not assessed before they completed the scale to assess the impact of religion (see Hergovich et al., 2005) on their belief in black magic. We recommend that future studies consider religiosity in respondents when they relate their beliefs in black magic; this would measure an association between religion and black magic. Future studies should also cross-validate the scale in various cultural contexts, particularly in Asian countries. We believe the BMBS can be useful in clinical settings when beliefs about black magic interfere with the well-being of mentally disturbed patients.

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Declarations

Conflict of interest The authors declare that they have no conflict of interest.

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References

Abbo, C., Ekblad, S., Waako, P., & Musisi, S. (2009). The prevalence and severity of mental illnesses handled by traditional healers in two districts in Uganda. *African Health Sciences, 9*(1), 16–22.

Abdi, H. (2003). Factor rotations in factor analyses. In *Encyclopedia for research methods for the social sciences* (pp. 792–795). https://personal.utdallas.edu/~herve/Abdi-rotations-pretty.pdf

Ae-Ngibise, K., Cooper, S., Adiibokah, E., Akpalu, B., Lund, C., & Lund, C. (2010). 'Whether you like it or not people with mental problems are going to go to them': A qualitative exploration into the widespread use of traditional and faith healers in the provision of mental health care in Ghana. *International Review of Psychiatry, 22*(6), 558–567. https://doi.org/10.3109/09540261.2010.536149

Aleem, N., Shah, B. H., Shaikh, S. S., Shabbir, T., & Zehra, A. (2021). Depiction of black magic in Pakistani dramas and its impact on viewers: An analysis with mixed method approach. *PalArch's Journal of Archaeology of Egypt/egyptology, 18*(10), 2612–2625.

Anna Rosa, D. (2018). Paranormal health beliefs: Relations between social dominance orientation and mental illness. *Open Psychology Journal, 11*(1), 35–45. https://doi.org/10.2174/1874350101811010035

Arbuckle, J. L. (2013). Amos (Version 22.0) [Computer Program]. Chicago: SPSS.

Aslam, N. (2017). Panic disorder: A common yet underdiagnosed and misunderstood illness in Pakistan. *Pakistan Journal of Medical Research, 56*(1), 1–2.

Auton, H. R., Pope, J., & Seeger, G. (2003). It isn't that strange: Paranormal belief and personality traits. *Social Behavior and Personality: An International Journal, 31*(7), 711–719. https://doi.org/10.2224/sbp.2003.31.7.711

Batool, I. (2016). Why females visit shrines: A case study of darbar Hazrat Syed Sakhi Mehmod Badshah. *Explorer Islamabad: Journal of Social Sciences, 2*(5), 123–127.

Bhattacharjya, A., Borah, N. K., & Sarma, A. (2021). A review of black magic: A hinderance for socioeconomic development. *International Journal of Creative Research Thoughts, 9*(5), 2320–2882.

Black magic. (2013). In *Cambridge dictionary* (4th ed.). Cambridge University Press.

Bollen, K. A. (1989). A new incremental fit index for general structural equation models. *Sociological Methods and Research, 17*, 303–316. https://doi.org/10.1177/0049124189017003

BrckaLorenz, A., Chiang, Y., & Nelson Laird, T. (2013). *Internal consistency*. Retrieved December 20, 2022, from https://scholarworks.iu.edu/dspace/handle/2022/24497

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. *Sociological Methods & Research, 21*(2), 230–258. https://doi.org/10.1177/0049124192021002005

Burge, S. R. (2021). The demystification of magic in the Tafsīr al-Manār: An analysis of the exegetical and homiletic devices used in the discussion 'Mab ḥ ath al-siḥr wa-Hārūt wa-Mārūt.' *Religions, 12*(9), 734. https://doi.org/10.3390/rel12090734

Bussien, N., d'Ovidio, F., Graziani, L., McCreery, K., Marfisi, L., Ramaboea, B., & Ross, F. (2011). *Breaking the spell: Responding to witchcraft accusations against children* (No.197). Retrieved December 22, 2022, from https://www.refworld.org/docid/4d8879542.html

Cattell, R. B. (1966). The scree test for the number of factors. *Multivariate Behavioral Research, 1*(2), 245–276. https://doi.org/10.1207/s15327906mbr0102_10

Cerny, C. A., & Kaiser, H. F. (1977). A study of a measure of sampling adequacy for factor-analytic correlation matrices. *Multivariate Behavioral Research, 12*(1), 43–47. https://doi.org/10.1207/s15327906mbr1201_3

Chaudhry, W. I., & Rafi, T. (2012). Witchcraft to witch lore: A transformation in concepts and practices. *Journal of Asian Civilizations, 35*(1), 1–15.

Comrey, A., & Lee, H. (1992). *A first course in factor analysis*. Erlbaum.

Connolly, S. (2011). *Curses, hexes & crossing: A magician's guide to execration magick*. DB Publishing.

Costello, A. B., & Osborne, J. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research, and Evaluation, 10*(1), 7. https://doi.org/10.7275/jyj1-4868

DiGregorio, S. (2013). *Practical black magic: How to hex and curse your enemies.* Winter Tempest Books.

Drinkwater, K., Denovan, A., Dagnall, N., & Parker, A. (2017). An assessment of the dimensionality and factorial structure of the revised paranormal belief scale. *Frontiers in Psychology, 8*, 1693. https://doi.org/10.3389/fpsyg.2017.01693

Eisenbarth, H., Lilienfeld, S. O., & Yarkoni, T. (2015). Using a genetic algorithm to abbreviate the Psychopathic Personality Inventory-Revised (PPI-R). *Psychological Assessment, 27*(1), 194–202. https://doi.org/10.1037/pas0000032

Ezzy, D. (2006). White witches and black magic: Ethics and consumerism in contemporary witchcraft. *Journal of Contemporary Religion, 21*(1), 15–31. https://doi.org/10.1080/13537900500381609

Farooqi, Y. N. (2006). Traditional healing practices sought by Muslim psychiatric patients in Lahore, Pakistan. *International Journal of Disability, Development and Education, 53*(4), 401–415. https://doi.org/10.1080/10349120601008530

Finch, H. (2006). Comparison of the performance of varimax and promax rotations: Factor structure recovery for dichotomous items. *Journal of Educational Measurement, 43*(1), 39–52. https://doi.org/10.1111/j.1745-3984.2006.00003.x

Forsyth, M. (2016). The regulation of witchcraft and sorcery practices and beliefs. *Annual Review of Law and Social Science, 12*, 331–351. https://doi.org/10.1146/annurev-lawsocsci-110615-084600

Gadit, A. A. M. (2011). Opinion and debate—Paranormal phenomena: Is there a role for mental health professionals? *JPMA-Journal of the Pakistan Medical Association, 61*(5), 506–507.
Garcia, A. (2013). *Critical foundations in young adult literature: Challenging genres.* Sense Publishers.
Garson, G. D. (2008). *Topics in multivariate analysis*. Retrieved March 20, 2020, from http://faculty.chass.ncsu.edu/garson/PA765/factor.htm
Gnanaolivu, S. D., Campera, M., Nekaris, K. A. I., Nijman, V., Satish, R., Babu, S., & Singh, M. (2022). Medicine, black magic and supernatural beings: Cultural rituals as a significant threat to slender lorises in India. *People and Nature, 4*(4), 1007–1019.
Graham, J. M., & White, D. (2015). Muslim nursing student beliefs about possession states: An exploratory survey of beliefs and causal attributions. *Journal of Educational Thought, 48*(1–2), 43–60.
Grover, S., Nebhinani, N., Chakrabarti, S., Shah, R., & Avasthi, A. (2014). Relationship between first treatment contact and supernatural beliefs in caregivers of patients with schizophrenia. *East Asian Archives of Psychiatry, 24*(2), 58–67.
Hayes, K. E. (2019). *Holy harlots: Femininity, and black magic in Brazil*. University of California Press.
Hergovich, A., Schott, R., & Arendasy, M. (2005). Paranormal belief and religiosity. *Journal of Parapsychology, 69*(2), 293–303.
Hooper, D., Coughlan, J., & Mullen, M. R. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods, 6*, 53–60. https://doi.org/10.1057/978-1-137-41024-5_4
Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal, 6*(1), 1–55. https://doi.org/10.1080/10705519909540118
Hulin, C., Netemeyer, R., & Cudeck, R. (2001). Can a reliability coefficient be too high? *Journal of Consumer Psychology, 10*(1), 55–58.
Hutcheson, G., & Sofroniou, N. (1999). *The multivariate social scientist: Introductory statistics using generalized linear models.* Sage.
IBM Corp. (2020). IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp. [Computer software].
Illes, J. (2010). *The Weiser field guide to witches: From hexes to Hermoine Granger, from Salem to the land of oz*. Weiser Books.
International Religious Freedom Report. (2019). *2017 report on international religious freedom*. U.S. Department of State, Bureau of Democracy, Human Rights, and Labor.
Jacob, K. S. (2019). Understanding black magic and other systems of belief. *National Medical Journal of India, 32*(3), 167–170.
Jenkins, R. (2014). *Black magic and bogeymen: Fear, rumor, and popular belief in Northern Ireland 1972–74*. Cork University Press.
Joshi, P. C., Kaushal, S., Katewa, S., & Devi, O. H. (2006). Witchcraft beliefs and practices among Oraons. *Studies of Tribes and Tribals, 4*(2), 145–149. https://doi.org/10.1080/0972639X.2006.11886547
Kaiser, H. F. (1960). The application of electronic computers to factor analysis. *Educational and Psychological Measurement, 20*(1), 141–151. https://doi.org/10.1177/001316446002000116
Kamali, M. H. (2011). Islam's views on sorcery and black magic. *ICR Journal, 2*(3), 564–565. https://doi.org/10.52282/icr.v2i3.635
Kate, N., Grover, S., Kulhara, P., & Nehra, R. (2012). Supernatural beliefs, aetiological models and help seeking behaviour in patients with schizophrenia. *Industrial Psychiatry Journal, 21*(1), 49–54. https://doi.org/10.4103/2F0972-6748.110951
Khalifa, N., Hardie, T., Latif, S., Jamil, I., & Walker, D. M. (2011). Beliefs about jinn, black magic and evil eye among Muslims: Age, gender and first language influences. *International Journal of Culture and Mental Health, 4*(1), 68–77. https://doi.org/10.1080/17542863.2010.503051
Lasikiewicz, N. (2016). Perceived stress, thinking style, and paranormal belief. *Imagination, Cognition and Personality, 35*, 306–320. https://doi.org/10.1177/0276236615595235
Levin, J. (2008). Esoteric healing traditions: A conceptual overview. *Journal of Science and Healing, 4*(2), 101–110. https://doi.org/10.1016/j.explore.2007.12.003
Lynn, M. R. (1986). Determination and quantification of content validity. *Nursing Research, 35*(6), 382–386.
Mathijsen, F. (2009). Empirical research and paranormal beliefs: Going beyond the epistemological debate in favour of the individual. *Archive for the Psychology of Religion, 31*(3), 319–333.
Mohanty, A. (2021). Gender difference in locus of control: A comparative study. *International Journal of Indian Psychology, 9*(4), 935–949.
Mohyuddin, A., & Rehman, I. (2015). Impact of black magic and witchcraft in a Muslim community. *Mystic Thoughts—Research Journal of Sufism and Peace*, *1*(1).
Moro, P. A. (2018). Witchcraft, sorcery, and magic. In *The international encyclopedia of anthropology* (pp. 1–9). John Wiley & Sons.

Nie, F., & Olson, D. V. A. (2016). Demonic influence: The negative mental health effects of belief in demons. *Journal of the Scientific Study of Religion, 55*(3), 498–515.
Norusis, M. J. (2005). *SPSS 14.0 Advanced statistical procedures companion.* Prentice Hall.
Perho, I. (2012). Magic in the ḥadīths. *Orientalia Suecana, 61*(Suppl.), 183–193.
Perlmutter, D. (2013). The politics of Muslim magic. *Middle East Quarterly, 20*(2), 73–80.
Pew Research Center. (2012). The world's Muslims: Unity and diversity [Report].Retrieved December 19, 2022,from https://www.pewrese.arch.org/religion/2012/08/09/the-worlds-muslims-unity-and-diversity-4-other-beliefs-and-practices/
Qidwai, W. (2003). Use of the services of spiritual healers among patients presenting to family physicians at a teaching hospital in Karachi. *Pakistan. Pakistan Journal of Medical Science, 19*(1), 52–56.
Qiliang, W. (2009). Religion, legal pluralism and order in a multiethnic society: A legal-anthropological study in contemporary China. *Journal of Legal Pluralism and Unofficial Law, 41*(59), 1–27.
Rabeyron, T., & Watt, C. (2010). Paranormal experiences, mental health and mental boundaries, and psi. *Personality and Individual Differences, 48*(4), 487–492.
Rassool, G. H. (2018). *Evil eye, jinn possession, and mental health issues: An Islamic perspective.* Routledge.
Russell, D. W. (2002). In search of underlying dimensions: The use (and abuse) of factor analysis in personality and social psychology bulletin. *Personality and Social Psychology Bulletin, 28*(12), 1629–1646.
Sapkota, N., Shakya, D. R., Adhikari, B. R., Pandey, A. K., & Shangwa, P. M. (2016). Magico-religious beliefs in schizophrenia: A study from Eastern part of Nepal. *Journal of College of Medical Science—Nepal, 12*(4), 150–159. https://doi.org/10.3126/jcmsn.v12i4.15046
Saudagar, I., & Khalid, Z. (2015). The growing supernatural factor: Gender wise perception of magic and evil eye in Pakistani society. *Explorer Islamabad: Journal of Social Sciences, 1*(8), 280–282.
Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *Journal of Educational Research, 99*(6), 323–338.
Shaikh, Z. A., Khatoon, F., Husain, S. S., Ibrahim, A. M., & Abdullah, M. (2010). Visiting holy shrines; A survey to assess the common reasons by devotees in Karachi-Pakistan. *Professional Medical Journal, 17*(3), 493–497.
Sinha, S. (2007). 1857 Witch-hunts, Adivasis, and the uprising in Chhotanagpur. *Economic and Political Weekly, 42*(19), 1672–1676.
Sram, Z. (2017). Psychotherapy and depression as predictor of the satanic syndrome. *Open Theology, 3*, 90–109.
Tobacyk, J. (1988). A revised paranormal belief scale. Unpublished manuscript. Louisiana Tech University.
Tobacyk, J. J. (2004). A revised paranormal belief scale. *International Journal of Transpersonal Studies, 23*(23), 94–98.
Tobacyk, J., & Milford, G. (1983). Belief in paranormal phenomena: Assessment instrument development and implications for personality functioning. *Journal of Personality and Social Psychology, 44*(5), 1029–1037.
Utinans, A., Ancane, G., Tobacyk, J. J., Boyraz, G., Livingston, M. M., & Tobacyk, J. S. (2015). Paranormal beliefs of Latvian college students: A Latvian version of the revised paranormal belief scale. *Psychological Reports, 116*(1), 116–126.
Vanderheyden, V. (2012). Between religion and magic: Clerics and common people in the Lier witch trials of 1589 and 1603. In E. H. Scott & J. S. Timothy, J. S. (Eds.), *Magic and the supernatural* (pp. 23–35). Inter-Disciplinary Press.
Williams, E., Lewis, C., & Francis, L. (2009). Introducing the Modified Paranormal Belief Scale: Distinguishing between classic paranormal beliefs, religious paranormal beliefs and conventional religiosity among undergraduates in Northern Ireland and Wales. *Archive for the Psychology of Religion, 31*(3), 345–356. https://doi.org/10.1163/008467209X12499946199605
Zadeh, T. (2014). *Commanding demons and jinn: The sorcerer in early Islamic thought.* Retrieved March 20, 2021. from https://www.academia.edu/27570845/
Zebb, B. J., & Moore, M. C. (2003). Superstitiousness and perceived anxiety control as predictors of psychological distress. *Journal of Anxiety Disorders, 17*(1), 115–130.

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