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Witchcraft and Biopsychosocial Causes of Mental Illness

Attitudes and Beliefs About Mental Illness Among Health Professionals in Five Countries

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Abstract: This study examines the intercorrelation of measures reflecting beliefs about and attitudes toward people with mental illness in a sample of health professionals ($N = 902$) from five countries: Brazil, China, Ghana, Nigeria, and the United States, and, more specifically, the association of beliefs in supernatural as contrasted with biopsychosocial causes of mental illness. Factor analysis of a 43-item questionnaire identified four factors favoring a) *socializing* with people with mental illness; b) *normalizing* their roles in society; c) belief in *supernatural* causes of mental illness (e.g., witchcraft, curses); and d) belief in *biopsychosocial* causes of mental illness. Unexpectedly, a hypothesized negative association between belief in supernatural and biopsychosocial causation of mental illness was not found. Belief in the biopsychosocial causation was weakly associated with less stigmatized attitudes towards socializing and normalized roles.

Key Words: Attitudes and beliefs about causation of mental illness, mental health providers, cross-cultural research, international comparison

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Beliefs about the causes of mental illness and the attitudes toward relationships with and the appropriate social roles of people with mental illness are influenced by personal experiences and professional training, as well as by broader cultural factors, and are of characterized by some degree of stigma (Furnham and Muraio, 2000; Furnham and Wong, 2007).

Variations in the sociocultural meaning of mental illness and related beliefs and attitudes may affect help-seeking behaviors, choice of treatment and service use, the quality of life of people who have mental illness and their family members, as well as the quality of care provided by health professionals who care for them (Corrigan, 2004; Eisenbruch, 1990; Mechanic, 1995). Social distancing from people with mental illness by friends and family members is a further, well-documented manifestation of stigma (Wahl, 1999), which can be a powerful barrier to employment, living independently in society, and achieving life goals. It has been suggested that social attitudes toward people with mental

illness can be more devastating than the disorder itself (Hinshaw and Cicchetti, 2000; Jensen and Dam, 1992).

Stigma toward people with mental illness can be understood as representing three basic elements: *stereotype* (negative beliefs about a group), *prejudice* (agreement with these beliefs), and *discrimination* (behavioral response to prejudice, e.g., avoidance, distancing; Corrigan and Watson, 2002).

In Erving Goffman's conceptualization of social stigma, a central feature, is an attribute that extensively discredits an individual, reducing him/her "from a whole and usual person to a tainted, discounted one," causing an individual to be mentally restricted by others as "an undesirable" (Goffman, 1963). Crocker et al. (1998, p. 505) added that stigmatization happens when a "person possesses (or is believed to possess) some attribute or characteristic that conveys a social identity that is devalued in a particular social context." This attribute marks the person as different, may lead to devaluation, and finally links the person to undesirable characteristics or stereotypes. These stereotypes are believed to be widely shared by members of the same culture (Crocker et al., 1998) and may become a basis for excluding or avoiding a member of the stereotyped group (Major and O'Brien, 2005). Manifestations of social stigma vary by sociocultural setting, mirroring aspects of the culture (Tylor, 1924). Social, cultural, and historical patterns of stigma thus provide a framework from which individuals with mental illness may be viewed (Subbotsky and Quinteros, 2002).

There are two prominent approaches to understanding the causes of mental illness. The "traditional" approach is thought by many to be relatively stigmatizing because it suggests religious or moral violation, character weakness, malevolent possession, or contamination by evil spirits or curses. In contrast, the biomedical or biopsychosocial approach emphasizes the contribution of a combination of what are assumed to be *relatively* but not entirely (see Angermeyer et al., 2011; Phelan, 2005) less stigmatizing biological, genetic, psychological, traumatic, toxic, or developmental processes (Eisenbruch, 1990; Landrine and Klonoff, 1992, 1994). Although it is often assumed that the traditional perspective in contrast to the more "natural," biopsychosocial view is mutually incompatible and that the former rather than the latter is more associated with social distancing, these assumptions needs to be tested, to the extent possible, with empirical data.

Attitudes and beliefs are major determinants of behavior and have a broad influence on social behavior (Al-Adawi et al., 2002; Sussman, 1997), and a considerable literature has identified cross-cultural differences in beliefs about the causes of mental illness. For example, in one survey of Australians and Japanese (Nakane et al., 2005), Australians were more likely to believe in infection, allergy, or genetics as a cause of mental illness, whereas Japanese tended to believe in "weakness of character," which was associated with a less optimistic view of the potential for full recovery (Jorm et al., 2005). Similarly, a survey conducted in Turkey found that more than 60% of the rural population believed that "weakness of personality" is a cause of schizophrenia (Taskin et al., 2003).

In many Asian cultures, the stigma of mental illness in a family member can bring shame on the reputation of a whole family. As a

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Elina A. Stefanovics and Robert Rosenheck participated in data collection of the US sample, undertook statistical analysis, and drafted the manuscript. Maria Tavares Cavalcanti and Rocha Neto collected and provided data from Rio de Janeiro (Brazil) for the analysis. Hongbo He collected and provided data from Guangzhou Psychiatric Hospital (China). Adesuwa Ighodaro collected and provided data from Ibadan (Nigeria). Meaghan Leddy participated in data collection of the US sample. Angelo Ofori-Atta provided data from Accra (Ghana). All authors have read and approved the final manuscript.

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result, signs of mental illness may be hidden or ignored by both patients and family members, resulting in a delay in seeking professional help (Furnham and Muraio, 2000). A comparative study of Chinese people in Hong Kong and British people in England found that people who were raised in traditional Chinese culture had a more conservative and negative attitude toward mental illness corresponding to more religious and superstitious beliefs about the cause of mental illness than people from Britain (Furnham and Chan, 2004).

Razali et al. (1996) reported that supernatural explanations, such as witchcraft and possession by evil spirits, are often understood in non-Western cultures as causes of mental illness and mark individuals as moral outcasts. One third of a large community sample of Nigerians endorsed evil spirits as a cause of mental illness and 96% of the sample considered people with mental illness to be dangerous (Gureje et al., 2005). The authors conclude that traditional health beliefs and practices adversely influence the perceptions, attitudes, and care of people with mental illness and related behavior. It should be noted, however, that there is no society that totally excludes supernatural beliefs. Even within modern developed countries, some individuals endorse supernatural beliefs (Evans, 2001). On another hand, there is no society that entirely excludes natural beliefs, and even within highly traditional communities, some individuals endorse folk-biological beliefs (e.g., inheritance; Astuti et al., 2004) as a cause of illness. In most societies, supernatural explanations coexist alongside biopsychosocial accounts to some degree, but whether they exist in the same individuals, and especially health professionals, deserved empirical study.

Just as there is cross-cultural variation in beliefs and attitudes about mental illness in the general population, such differences in attitudes may extend to mental health professionals (Hahn and Gaines, 1985; Lock, 1987; Worsley, 1982). Both Rutz (2001) and Tomov (2001) have presented evidence that stigmatization of mental illness is common, for example, among professionals in Eastern European countries. Kishore et al. (2011) indicated that 11.8% of medical professionals in New Delhi, India, believed that fasting and faith healers can offer a cure for mental illness. A comparative study of perception of and attitude toward mental illness in Oman found that both medical students and the public rejected genetics as a factor causing mental illness and favored, instead, evil spirits as the etiological factor (Al-Adawi et al., 2002).

Although studies of the attitudes of mental health professionals are less common than studies of the general population (Hugo, 2001), one recent study examined differences in attitudes toward people with mental illness among health professionals from five countries (Brazil, Nigeria, China, Ghana, and the United States) and found substantial differences, with attitudes favoring the biopsychosocial view of mental illness in the United States and views favoring supernatural explanations in Nigeria and Ghana, with Brazil closer to the United States and the Chinese sample showing more stigmatizing attitude (Stefanovics et al., 2015).

Whereas the previous study (Stefanovics et al., 2015) demonstrated differences in the attitudes of professionals toward people with mental illness across countries, the current study uses the same data set to explore the interrelation of beliefs about causation of mental illness and attitudes toward people with mental illness both across and within the five countries. In light of the evidence of contrasting values across societies on a continuum from what we have called the traditional to the biopsychosocial perspectives on mental illness, a long tradition has assumed conflict and contradiction between what are roughly termed *religious* and *scientific* attitudes (Brooke, 1991). In response, we hypothesized that measures representing the biopsychosocial perspective would be negatively correlated with measures representing more traditional views and might be more strongly associated with more positive attitudes toward socializing with and role participation for people with mental illness. To our knowledge, this is the first study to examine the intercorrelation of contrasting beliefs and attitudes in an international sample of health care professionals.

METHOD

Samples

This exploratory study used surveys from convenience samples of health professionals (including medical students, trainees, and graduate professionals) from five different countries (Brazil, China, Ghana, Nigeria, and the United States).

The US sample ($n = 107$) consists of medical professionals, clinical staff including nurses, social workers, psychologists, and psychiatrists surveyed at the VA Connecticut Healthcare System (West Haven, CT), an affiliate of Yale Medical School, from April 2013 to March 2014. The survey was offered at departmental meetings and seminars and preceded an educational activity that addressed the issue of stigma in different contexts and cultures. Participation in the survey was completely voluntary and anonymous.

The Brazilian sample ($n = 77$) consisted of fifth year medical students (in a 6-year course of study) from the Federal University of Brazil (Rio de Janeiro, Brazil), a public university and the largest federal university in the country, one with an active research and teaching program in psychiatry. The survey was translated into Portuguese by bilingual speakers at the medical school and back-translated to evaluate its consistency.

The Ghanaian sample ($n = 87$) came from the University of Ghana Medical School College of Health Sciences (Accra, Ghana). The questionnaire was distributed by hand to the entire medical student class before the final conference of their psychiatry rotation and collected in person on the day of its distribution. The instrument was used in the original English version as English is the official national language of Ghana.

The Nigerian survey ($n = 345$) was conducted in the summer of 2013 on sample of medical students of the University College Hospital and primary care physicians practicing in the city of Ibadan, Nigeria (Ighodaro et al., 2014). The survey was used in its original English version as English is the official language of Nigeria.

The Chinese sample ($n = 286$) included medical professionals (psychiatrists and nurses) working at the Guangzhou Psychiatric Hospital in Guangzhou, the oldest psychiatric hospital in China and the largest in southern China. The hospital is also the psychiatric teaching facility for the Guangzhou Medical College, Sun Yat-Sen University, and Guangzhou University of Chinese Medicine. The voluntary anonymous survey was distributed in Guangzhou in January 2012 by hospital administrators to nurses and psychiatrists on the day shift. The questionnaire was originally written in English, translated into Chinese, and then back-translated into English by bilingual specialists. Responses were received from 120 psychiatrists and 162 nurses. Consent to participate in the survey was assumed by the act of completing the questionnaire. The total sample from all five countries included 902 individuals.

All studies were approved by of the local ethics or institutional review board (IRB) at individual locations, and for the overall comparative study, by the IRBs of the VA Connecticut Healthcare system and Yale Medical School. All participants were informed of the study aims and objectives and that submission of a completed questionnaire would imply consent to participate. In addition, it was highlighted that participation in the study was voluntary and no identifiable data would be collected.

Survey

The survey questionnaire included two parts. The first part consists of self-reported sociodemographic characteristics (age and gender) and the second part was a modified version of three previously developed attitude measures, the Fear and Behavioral Intentions Toward the Mentally Ill (FABI) questionnaire (Wolff et al., 1996), the Community Attitudes to Mental Illness (CAMI) scale (Taylor and Dear, 1981), and a modified version of a questionnaire from the Program to Reduce

Stigma and Discrimination (Stuart and Arboleda-Flórez, 2001). It consists of 43 items with both positive and negative dichotomous wordings and their subquestions.

Attitude Measures

Conceptions of the Cause of Mental Illness

Potential causes of mental illness were measured by 12 yes/no questions, grouped by social factors and personal, supernatural, and biological factors, naming possible causes of mental disorders and included drug/alcohol misuse, traumatic event, stress, physical abuse, biological factors, brain disease, genetics, poverty, possession by evil spirit, God's punishment, witchcraft, and curse.

Stereotypes of dangerousness or unpredictability as well as the tendency to hold people with mental illness as blameworthy for their problems were assessed by the following questions: "I am afraid of people with mental illness"; "Anyone with mental illness should not be given any responsibility"; "As soon as a person shows signs of mental disturbance, he should be hospitalized"; and "People with mental illness don't deserve our sympathy."

Possible Treatment Options

Respondents were also asked whether mentally ill people should be treated outside the hospital and if mental health services should be provided through community-based services. There were further questions on the effect on a neighborhood if mental health facilities were located in the residential areas. These questions were based on CAMI developed by Taylor and Dear (1981).

Social Distance

Social distance was assessed with questions such as "Would you be afraid of people with mental illness?" "Would you object to having mentally ill person living in your neighborhood?" or "Would you have conversation with your neighbor who had suffered from mental illness?" These questions were derived from the FABI questionnaire

Social Acceptance

Finally, social acceptance and social stigma were assessed by a series of questions that addressed items such as willingness to share a room or to marry someone with mental illness, being upset or disturbed about working on the same job as someone with mental illness, or being ashamed to have a family member who is a former psychiatric patient. Respondents were also asked if mental disorder was like any other illness. These questions were based on CAMI developed by Taylor and Dear (1981).

This instrument has been used initially in several settings in Nigeria (Iheanacho et al., 2014), China (Sun et al., 2014), and the United States (Chiles et al., under review).

Negatively worded questions were recoded in positive or progressive direction for the purpose of analysis. The established factor structure for this survey (Iheanacho et al., 2014; Stefanovics et al., 2015) includes four factors: 1) interest in or willingness to socialize with people diagnosed with mental illness, 2) favorable attitudes toward normalization of role functioning in the lives of people with mental illness, 3) belief in supernatural causes of mental illness (e.g., witchcraft,

curse, God's punishment, possession of evil spirit), and 4) endorsement of aspects of the biopsychosocial model of mental illness (brain disease, physical abuse, biological factors). Individual items and factors and item weights have been previously published (Iheanacho et al., 2014).

Data Analysis

First, univariate analysis including frequencies and means was used to describe the sociodemographic characteristics of the sample.

In the analysis of the questionnaire in a previous study (Iheanacho et al., 2014), exploratory factor analysis with varimax rotation was used for item reduction and identified the four factors described above. The structure was confirmed by confirmatory factor analysis (CFA) in the data set used in the present study (Stefanovics et al., 2015). Goodness-of-fit statistics for the CFA were as follows: $\chi^2(308) = 865, p < 0.0001$, goodness of fit index = 0.90, and root-mean-square error of approximation = 0.05, confirming that the previous factor structure adequately fit to the present data.

Factor scores were calculated by averaging the items that loaded on each factor. As the age was significant in bivariate analysis, multiple regression analysis was used to assess the relationships among factors (socializing, normalizing, nonbelief in supernatural causes of mental illness, and biopsychosocial explanation of mental illness) controlling for age. Standardized regression coefficients are reported. All analyses were conducted in SAS v 9.3 statistical software (SAS Institute Inc, Cary, NC). Statistical significance was evaluated at the 0.05 level.

RESULTS

The US sample was the oldest (mean [SD], 44.8 [0.86] years), followed by the Chinese (mean [SD], 31.9 [0.5] years), Nigerian (mean [SD], 27.5 [0.45] years), Ghanaian (mean [SD], 24.2 [0.98] years), and Brazilian samples (mean [SD], 23.8 [0.95] years), which were relatively younger.

Cronbach's alpha coefficients for the four factors were as follows: factor 1 (socializing) = 0.73 for the United States, 0.81 for China, 0.68 for Ghana, 0.72 for Nigeria, and 0.70 for Brazil; factor 2 (normalizing) = 0.86 for the United States, 0.70 for China, 0.62 for Ghana, 0.63 for Nigeria, and 0.66 for Brazil; factor 3 (nonbelief in supernatural causes of mental illness) = 0.93 for the United States, 0.75 for China, 0.77 for Ghana, 0.82 for Nigeria, and 0.69 for Brazil; and factor 4 (belief in biopsychosocial causes of mental illness) = 0.75 for the United States, 0.69 for China, 0.61 for Ghana, 0.66 for Nigeria, and 0.77 for Brazil.

One-way analysis of variance showed a significant main effect for age of participants across the five countries, $F(1, 869) = 103, p < 0.0001$ (Table 1). Chi-square tests of sex differences showed no significant differences among the groups, $\chi^2(4) = 5, p = 0.28$, and most of the participants were women.

In the overall sample, there was no significant association between believing in supernatural causes of mental illness and the biopsychosocial factor, after controlling for age ($r = -0.02, p = 0.61$; Table 2). The biopsychosocial factor, however, was significantly, albeit weakly, related to attitudes favoring socializing with people with mental illness ($r = 0.19, p < 0.0001$) and also with favoring normalized social roles ($r = 0.21, p < 0.0001$). In contrast, belief in supernatural causes of mental illness was very weakly associated with more stigmatized

TABLE 1. Sociodemographic Characteristics of the Sample, by Country

	United States (n = 107)	Brazil (n = 77)	Ghana (n = 87)	Nigeria (n = 345)	China (n = 286)	F/ χ^2	p
Age, mean (SD), yrs	44.8 (12.1)	23.8 (2.55)	24.5 (2)	27.5 (9)	32 (8.1)	103.8	<0.0001
Sex, male, n (%)	34 (32.7)	32 (42.7)	37 (44.05)	120 (34.9)	114 (39.9)	5.06	0.28

Note: F/ χ^2 *—F statistic for chi-square.

TABLE 2. Standardized Regression Coefficients for Correlations Between Factors Adjusted for Age

	<u>Factor 1 (Socializing)</u>	<u>Factor 2 (Normalizing)</u>	<u>Factor 3 (Nonsuperstitious)</u>
	β (p)	β (p)	β (p)
Factor 1 (socializing)			
Factor 2 (normalizing)	0.58 (<0.0001)		
Factor 3 (nonsuperstitious)	0.10 (0.002)	0.13 (<0.0001)	
Factor 4 (biopsychosocial causes)	0.189 (<0.0001)	0.21 (<0.0001)	-0.02 (0.61)

attitudes on both of these variables ($r = -0.10$, $p = 0.002$, for normalizing and $r = -0.13$, $p < 0.0001$).

Analyses for each country considered separately showed no significant relationship between belief in supernatural causes of mental illness and the biopsychosocial factor in subsamples drawn from samples of the five countries.

There were also significant, albeit predominantly weak, correlations between the biopsychosocial belief factor and both positive socializing and normalizing roles in each of the five countries considered separately (r values ranged from 0.13 to 0.50).

A significant, but again weak, negative correlation was observed between believing in supernatural causes of mental illness and favoring normalizing roles for people with mental illness ($r = -0.18$, $p < 0.0009$) or socializing ($r = -0.2$, $p = 0.0003$). This relationship was found in the data from Nigeria, but not in the data from any other individual country.

DISCUSSION

The current study used data from five different countries to explore the interrelation of four factors reflecting the attitudes and beliefs of health professionals toward mental illness and people with mental illness and, more specifically, the association between biopsychosocial and supernatural beliefs about the causation of mental illness. Contrary to our primary hypothesis, there was no significant association (negative or positive) between belief in supernatural causation of mental illness and belief in biopsychosocial causation in either the overall sample or within any given country, considered by itself.

Furthermore, in the total sample, a weak, positive correlation was observed between the biopsychosocial factor and both socializing and normalizing attitudes, as was also the case with the individual analyses from each of the five countries. However, because the strength of the detected correlations was uniformly weak (all falling below 0.30), they should not be understood to reflect a conclusive or necessarily meaningful association.

Individual conceptions of mental illness and its treatment often echo normative social and cultural interpretations. People can have various culturally shaped frameworks to explain such illnesses, any or all of which are potentially valid (Kleinman, 1980). Beliefs in the causation of mental illness through evil spirits or the work of God can be observed in many, if not all, cultures and religions of the world (Field, 1955; Lambo, 1956; Spanos, 1978) to some degree. Studies of “supernatural” and mystical beliefs (Brooke, 1991) about mental illness have been closely tied to studies of religious beliefs or religious practices more generally (Bascom, 1984). Following a long tradition that has assumed that religious and scientific attitudes are in conflict and an intellectual perspective embodied in the dramatic titles of Andrew Dickson White’s volume “A History of the Warfare of Science with Theology in Christendom (White, 1896)” or Richard Dawkins’ “The God Delusion” (Dawkins, 2009), we hypothesized that more scientifically oriented biopsychosocial beliefs and more traditional supernatural factors in our data would be negatively correlated. However, we found no support for this hypothesis in the integrated data set from all five nations or in

the data from each country considered independently. In this sample of health professionals, biopsychosocial and traditional beliefs about the causes of mental illness appear to coexist within the same people at the same time both within and across very different cultures.

Indeed, many leading scientists have reported experiencing no conflict at all between their personal religious faith and their scientific beliefs. A recent report, *Science, Evolution, and Creationism*, from the National Academy of Sciences and the Institute of Medicine (2008), concluded that “Science and religion are different ways of understanding. Needlessly placing them in opposition reduces the potential of both to contribute to a better future” and quotes leading scientists like Francis Collins, MD, PhD, the director of the National Institutes of Health, who experience no conflict between their scientific beliefs and their deeply held religious faith. Our data are more supportive of the latter views than the former. The importance of this finding is that educators, advocates, or professionals ought not to assume antagonism toward a biopsychosocial view of mental illness when encountering religious, or what we have called supernatural, beliefs among fellow professionals.

Our data thus argue against the view that people cannot hold biological and supernatural explanation at the same time and demonstrate that individuals may hold diverse and apparently contradictory views. As others have noted (Legare et al., 2012; Watson-Jones et al., 2015), biological and supernatural explanations can coexist in the interpretation of the same phenomena (in this case mental disorder) by the same person (Subbotsky, 2001) at the same time. This may be especially relevant for African countries where multiple explanatory frameworks exist. Some authors have implicitly assumed that supernatural explanations can exist only in the absence of “accurate” biological explanations (Mitchell, 1965)—and that biological information eventually replaces superstitious beliefs about the causation of illness. In contrast, the analyses presented here, among other studies, suggest that supernatural beliefs persist even when participants have had specific professional training about the biological causes of the illness and thus do not serve as a default explanatory framework only when accurate biological knowledge is lacking (Legare and Gelman, 2008).

We also found at least weak suggestions of an association between socializing and normalizing attitudes and the biopsychosocial factor. Such positive associations might be expected on the assumption that “objective,” “value-free,” “scientific” perspectives are less judgmental and stigmatizing than traditional views are. Although we anticipated that the biopsychosocial view might be associated with less stigmatizing attitudes on relationships and role norms, the effects were weak and thus do not robustly contradict recent studies suggesting that biopsychosocial views of the causation of mental illness are associated with stigma or with inclinations toward social exclusion of people with mental illness. For some diagnoses, such as schizophrenia, the biopsychosocial view may be associated with a desire for social distance based on stigmatizing beliefs in unalterable impairments with a genetic determinism (Angermeyer et al., 2011). Others, however, have suggested that biogenetic explanations of mental illness are not the major cause of stigma, rather stigma stems from the perceived behaviors associated with mental illness (Jorm and Griffiths, 2008) However,

these studies were conducted with general population samples (*i.e.*, with nonprofessionals) and may thus have less immediate relevance to the professionals who are the subject of the present study.

The inference that supernatural beliefs among health professionals would be negatively associated with recovery-oriented attitudes of social acceptance and normalizing roles is supported, again weakly, by data from the entire sample of health professionals. However, this finding was, in fact, driven by the data from only one country, Nigeria, which made up a relatively large proportion (38%) of respondents. This association was not observed in the data from any other single country (Brazil, the United States, China, or Ghana). Thus, our analyses are somewhat consistent with findings (Akighir, 1982; Aydin et al., 2003; Barke et al., 2011; Razali et al., 1996) that respondents from African countries who believed in supernatural causes of mental illness have been more reluctant to accept psychiatric treatment and show low medication compliance and premature treatment discontinuation, but, again, the observed association is weak and significant for only one country.

Several methodological limitations require comment. The study population targeted was a convenience sample of health professionals from five different countries and thus cannot be assumed to be representative of mental health professional population or the general population of these countries. Because of the need to protect respondent's privacy, no personal identifying information was obtained that could subsequently be used to distinguish participants who agreed to be in the study from those who refused to participate.

In addition, the reliability and validity of the survey instrument used have not been extensively evaluated. Although the construct validity of the factor structure of the instrument was confirmed in previous studies (Iheanacho et al., 2014) and evaluated through the means of CFA in an earlier study (Stefanovics et al., 2015), more extensive validating evidence would be desirable.

Third, our measure was based on simple agreement or disagreement with hypothetical questions that did not specify any particular mental illness. Attitudes toward people with depression or anxiety disorder may be more accepting than those toward schizophrenia or other severe mental illnesses or personality disorders (Kingdon et al., 2004; Munro and Baker, 2007). On the other hand, the items included in our survey have been used in previous studies (Iheanacho et al., 2014) and have been found to be relevant for health care providers. In addition, professionals surveyed have found the instrument to be simple and easy to understand, facilitating its use in natural settings in which only a brief instrument can be used and in which technical knowledge of differences between specific mental illnesses cannot be assumed.

Fourth, we must acknowledge that the link between attitudes and actual behavior is unknown and very difficult to study. The observations presented here reflect differences in stated attitudes but cannot be taken as evidence of differences in the quality of care delivered or the level of professional skills or behavior (Angermeyer and Dietrich, 2006). This limitation applies to all research into attitudes toward mental illness.

Despite these limitations, the results strikingly failed to demonstrate any evidence of the hypothesized negative association between supernatural beliefs about the causes of mental illness and belief in the biopsychosocial model. This study has thus demonstrated an apparent absence of conflict between traditional beliefs and current biopsychosocial perspectives and thus offers hope that, at least among medical professionals, traditional beliefs need not, in themselves, impede the promotion of contemporary approaches to mental health treatment and to the "recovery approach" in which mental health professional are urged to prioritize patients' own coping strategies even when not based on tenants of the biopsychosocial model.

DISCLOSURE

The authors declare no conflict of interest.

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