A cross-sectional study was performed at five hospitals and one mental clinic and included 212 patients, 144 family members, and 347 medical staff other than psychiatrists. A questionnaire about the possible etiological causes of schizophrenia was used. There were significant differences in response scores among the three groups on using Angermeyer’s and Goulding’s classifications. Factor analyses revealed the following four subscales: Psychosocial, Biological, Environmental, and Cultural connotations. The structure varied among patients, family, and medical staff.

Conclusion: The perspectives of schizophrenia etiology were different among patients, family, and medical staff.

Keywords: schizophrenia, etiology, perception, family, caregivers, beliefs, etiological causes, patients, medical staff

Introduction

Schizophrenia is the most common psychiatric disorder, and it negatively impacts not only the general population but also patients and their families. Our understanding of schizophrenia has progressed through advances in epidemiology and neuroimaging; but for over four decades, the dopamine hypothesis has remained the leading pathoetiological theory of schizophrenia.1–3 Additionally, schizophrenia represents complex and multidimensional phenotypes with high heritability rates, exceeding 80% in twin studies.4–6 On the other hand, numerous environmental factors have been found to play an important role in the causality of schizophrenia. Factors that have been found to increase the risk of schizophrenia7–9 include cannabis use,9 chronic psychosocial stressors, including childhood adversity,10 migration/ethnic minority status,11 and urbanicity.12 Furthermore, acute stress plays a role in triggering psychotic symptoms,13,14 and impaired stress tolerance is associated with prodromal symptoms.15

Beliefs about pathoetiology are associated with attitudes toward persons with mental illnesses.16 Pathways to accessing health care are believed to be influenced by the beliefs of family members about the cause of the illness.17,18 In Western countries, biological and psychosocial causes are more common than supernatural causes.19–21 In contrast, non-Western cultures tend to endorse supernatural causes.22,23 However, there was no information on beliefs regarding schizophrenia in Japan, which is a developed country but is not fully influenced by Western culture. In fact, the major difference in beliefs about the causes of illness in the general population was that Australians were more likely to believe that illnesses were caused by viruses, infections,
or allergies, or that they were inherited or genetic, while the
Japanese were more likely to fault a nervous personality or
weakness of character.24

A Cochrane review of hospital-based studies of limited
quality concluded that psychoeducation for schizophrenia
seems to reduce relapse and readmission and encourage
medication compliance, as well as reduce the length of
hospital stay.25 Psychoeducation may be defined as educating
a person with a psychiatric disorder in subject areas that serve
treatment and rehabilitation goals. This definition implies
that there is a focus on knowledge and etiological beliefs
surrounding schizophrenia.

Beliefs about the pathoetiology of schizophrenia have
been shown to influence the perceptions of those affected
and their likelihood to seek treatment.26–28 This study investigated
the beliefs and knowledge of patients and family regarding
the causes or etiology of schizophrenia. The study setting
was in Aomori, which is in the countryside of Japan. Aomori
is famous for its culture, which is a unique combination of
Shamanism and Buddhism.29 Additionally, the objective of
this study was to examine the differences in the factor struc-
ture of a 30-item list of possible causes of schizophrenia as
perceived by patients, family, and medical staff.

Subjects and methods
The study was conducted between July and December 2015
in six separate mental clinics and psychiatric hospitals in
Aomori, Japan. This study was approved by the ethical
committees of Hirosaki University and each hospital. All
participants provided written informed consent, and this
study was conducted in accordance with the Declaration of
Helsinki. Patients and family members were recruited from
the same facilities. Medical staff, including pharmacists,
psychologists, psychiatric nurses, clerks, psychiatric social
workers, and staff who cooked and delivered hospital meals,
were recruited from two psychiatric hospitals (Kuroishi-
Akebono Hospital and Hiroaki-Aiseikai Hospital) and the
Department of Neuropsychiatry, Mutsu General Hospital;
all of the staff came into contact with schizophrenia patients.
Questionnaires were hand delivered in envelopes to the staff.
The questionnaires were collected by mail. The recovery
rates were 72% for patients, 68% for family members, and
89% for the medical staff.

For each sample of patients, basic demographic infor-
mation such as age, gender, education level, and duration
of illness were collected. Each sample provided data on
etiological beliefs, obtained using the 30-item list of the
possible causes of schizophrenia, which was measured on a
4-point Likert scale.30,31 For each of the 30 causes, patients
were asked, “Is this a cause of your disease?”; families were
asked, “Is this a cause of your family’s disease?”; and medical
staff were asked, “Is this a cause of schizophrenia?”.
All participants were instructed to select either “no”, “possibly”,
“likely”, or “very likely”. Participants who left >5 of the
30 items blank were excluded from the analyses, resulting
in a final sample size of n=214, 145, and 347, respectively.

All analyses were performed using SPSS 25.0 (IBM
Corporation, Tokyo, Japan). Answers of “no”, “possibly”,
“likely”, and “very likely” were scored 1, 2, 3, and 4, respec-
tively. Factor analysis was performed using the principal
axis factoring method with oblique (promax) rotation. This
factor analysis was performed within the medical staff group
alone. ANOVA was performed followed by Tukey’s test to
detect differences among patients, family, and medical staff.
P<0.05 was considered significant.

Results
The mean age (years) of patients, family members, and medi-
cal staff was 46.0±11.7, 44.1±12.6, and 37.8±8.1, respectively.
There were significant differences in response scores among
the three groups. Using Angermeyer’s classification, which is
the five conceptually based categories proposed by the list
developers,30 the scores for Biological, Personality, Family,
and Societal causes among medical staff were significantly
higher than they were among patients and family (Table 1).
Using Goulding’s classification based on the first examina-
tion of the latent or factorial structure,31 the scores for Personality/
family/social stressors and External/environmental insults
to the brain were significantly higher among medical staff
than among patients or families, which is consistent with the
modern biological conceptions of medical staff (Table 1).

The Kaiser–Meyer–Olkin (KMO) measure was 0.934,
and Bartlett’s test of sphericity was significant (χ²=9.044,
degrees of freedom [df] =435, P<0.001) in all subjects.
Although the initial principal axis factoring method yielded
nine factors with eigenvalues >1.0, explaining 52.5% of
the cumulative variance, the point where the slope of the
curve clearly leveled off was 4. Accordingly, we created
the following four subscales: Psychosocial, Biological,
Environmental, and Cultural connotations (Table 2). The
KMO measure was 0.804, 0.699, and 0.928 and Bartlett’s
test of sphericity was significant for patients (χ²=1.902,
df =435, P<0.001), family (χ²=1.325, df =435, P<0.001),
and medical staff (χ²=5,773, df =435, P<0.001), respectively.
The structure varied among patients, family, and medical staff (Table 2).

**Discussion**

In our sample, the good internal consistency of the overall 30-item list of the possible causes of schizophrenia (α=0.925) indicated that this scale can be used as a reliable screening tool. The results of this exploratory factor analysis revealed four factors, which were used to create four subscales, termed Psychosocial (15 items), Biological (6 items), Environmental (6 items), and Cultural connotations (3 items). Because the structure varied among patients, family, and medical staff, the etiological beliefs about schizophrenia were different among them.

Using Angermeyer’s classification, Psychosocial, Biological, Societal, and Personality were the predominant causes perceived by medical staff. Using Goulding’s classification, modern biological conceptions were the most predominant cause considered by medical staff, while Personality/family/social stressors and Inconsistent with modern conceptions of risk were comparable in patients and family. This finding suggests that etiological beliefs about schizophrenia among patients and their families may be complex. It is necessary to keep in mind that beliefs regarding the psychosocial causes of schizophrenia, such as failure, avoidance of problems, stressful life events, constant strain in school/jobs, and difficulty in marriage/relationships, are as common as beliefs about inherent causes and chemical imbalances among patients and their families.

The scores for the subscales other than Esoteric or Inconsistent with modern conceptions of risk among medical staff were significantly higher than those among patients and their families. Medical staff may form various causal beliefs about schizophrenia from textbooks or from their experiences with many schizophrenic patients, while patients and their families tend to form their specific causal beliefs of schizophrenia through their own experiences. In this study, the scores were significantly higher on the Psychosocial and Biological subscales than on the other subscales among patients. This finding is in line with the results obtained in Western countries.

Medical staff might think that biological treatment, including pharmacotherapy, is greatly beneficial in treating schizophrenia because their etiological beliefs regarding schizophrenia are most predominantly related to biological factors. However, patients and their families hope that psychotherapy focuses on Psychosocial and Familial/temperamental factors in addition to pharmacotherapy.

Mental health nurses as well as psychiatrists regarded antipsychotics as the most helpful for the treatment of schizophrenia. A recent British study showed that ordinary people also believed pharmacotherapy to be more effective than psychotherapy for the treatment of schizophrenia. Conversely, Asian people believe that superstitious and religious ideas are more important in

---

**Table 1** Characteristics of subjects and average of factors response for the 30-item list of causal beliefs

<table>
<thead>
<tr>
<th>Characteristics and factors</th>
<th>Patients (n=224)</th>
<th>Family (n=123)</th>
<th>Medical staff (n=344)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years), mean ± SD</td>
<td>46.4±12.9</td>
<td>58.9±14.2</td>
<td>43.9±12.7</td>
<td></td>
</tr>
<tr>
<td>Gender: female, n (%)</td>
<td>125 (59)</td>
<td>82 (57)</td>
<td>228 (65)</td>
<td></td>
</tr>
<tr>
<td>Education (years), mean ± SD</td>
<td>12.4±2.08</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Angermeyer’s calcification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biological</td>
<td>1.44±0.44</td>
<td>1.33±0.37</td>
<td>2.25±0.52</td>
<td>M &gt; P***</td>
</tr>
<tr>
<td>Esoteric</td>
<td>1.31±0.46</td>
<td>1.11±0.26</td>
<td>1.30±0.39</td>
<td>P &gt; F***</td>
</tr>
<tr>
<td>Personality</td>
<td>1.75±0.70</td>
<td>1.50±0.54</td>
<td>2.04±0.63</td>
<td>M &gt; P***</td>
</tr>
<tr>
<td>Family</td>
<td>1.47±0.62</td>
<td>1.45±0.54</td>
<td>2.20±0.73</td>
<td>M &gt; P***</td>
</tr>
<tr>
<td>Societal</td>
<td>1.85±0.67</td>
<td>1.75±0.64</td>
<td>2.15±0.67</td>
<td>M &gt; P***</td>
</tr>
<tr>
<td>Goulding’s calcification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personality/family/social stressors</td>
<td>1.74±0.60</td>
<td>1.60±0.50</td>
<td>2.20±0.66</td>
<td>M &gt; P***</td>
</tr>
<tr>
<td>Inconsistent with modern conceptions of risk</td>
<td>1.73±0.57</td>
<td>1.52±0.42</td>
<td>1.82±0.55</td>
<td>P &gt; F***, M &gt; F***</td>
</tr>
<tr>
<td>External/environmental insults to the brain</td>
<td>1.21±0.36</td>
<td>1.14±0.24</td>
<td>1.66±0.75</td>
<td>M &gt; P***</td>
</tr>
<tr>
<td>Consistent with modern biological conceptions</td>
<td>1.90±0.80</td>
<td>1.65±0.75</td>
<td>3.04±0.69</td>
<td>M &gt; P***, M &gt; F***, P &gt; F***</td>
</tr>
</tbody>
</table>

Notes: *P<0.05, **P<0.01, ***P<0.001.
Abbreviations: P, patients; F, family; M, medical staff.

Dovepress
Neuropsychiatric Disease and Treatment 2019:15
submit your manuscript | www.dovepress.com
Neuropsychiatric Disease and Treatment is an international, peer-reviewed journal covering the spectrum of clinical conditions associated with neuropsychiatric disease and focuses on medication adherence, treatment optimization, and whole-body management approaches.

Dovepress
Neuropsychiatric Disease and Treatment downloaded from https://www.dovepress.com/ by 54.70.40.11 on 09-Mar-2019
For personal use only.
Powered by TCPDF (www.tcpdf.org)
relation to the causes and treatments of schizophrenia, although our study suggests that a religious or spiritual influence is unlikely for patients and their families. Nakane et al reported that Japanese, compared to Australians, were more likely to consider the causes of schizophrenia to be related to a nervous personality or weakness of character, which may well be treated with psychotherapy rather than pharmacotherapy with psychotropic medications. In addition, the general populations of Germany, the Slovak Republic, and Russia all prefer psychotherapy to psychotropic medication. In Aomori prefecture, there are shamans called itako or kamisama who make predictions, tell fortunes, and provide medical care through their spiritual or religious power. Out of 670 informants, 232 (34.6%) had experience consulting a shaman. Females had a high tendency to consult shamans, and they went to shamans to address personal illness and family illness. Only 20% of the informants experienced no change. The remaining informants felt healed.

In the present study, the higher scores for Psychosocial and Familial/temperamental than for Biological might be attributed to this cultural background. Limitations

This study is associated with several notable limitations. The first limitation is the recruitment strategy used. The assessment of the severity of schizophrenia was not evaluated. The severity of schizophrenia among our participants might be milder than that seen in the general population of people with schizophrenia. Thus, our sampling might not be representative.

Table 2 Rotated factor loadings for the 30-item list of causal beliefs in total subjects, patients, family, and medical staff

<table>
<thead>
<tr>
<th>Items</th>
<th>Total Factor 1</th>
<th>Total Factor 2</th>
<th>Total Factor 3</th>
<th>Total Factor 4</th>
<th>Patients Factor 1</th>
<th>Patients Factor 2</th>
<th>Patients Factor 3</th>
<th>Patients Factor 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disturbance of brain biochemistry</td>
<td>0.659</td>
<td>0.403</td>
<td>0.515</td>
<td>0.492</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hereditary factors</td>
<td>0.732</td>
<td>0.329</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infection in the brain</td>
<td>0.642</td>
<td>0.515</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain injury</td>
<td>0.807</td>
<td>0.752</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug/alcohol abuse</td>
<td>0.697</td>
<td>0.451</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stressful life events</td>
<td>0.645</td>
<td>0.496</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Constant strain in school/job</td>
<td>0.635</td>
<td>0.406</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidance of problems in life</td>
<td>0.660</td>
<td>0.773</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hostile/rejecting attitude of parents</td>
<td>0.636</td>
<td></td>
<td>0.672</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure in life</td>
<td>0.717</td>
<td>0.799</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Broken home</td>
<td>0.651</td>
<td></td>
<td>0.534</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loneliness</td>
<td>0.680</td>
<td>0.613</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Birth trauma</td>
<td>0.661</td>
<td>0.615</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical disease outside the brain</td>
<td></td>
<td>0.496</td>
<td></td>
<td>0.435</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possession by evil spirits</td>
<td></td>
<td>0.440</td>
<td></td>
<td>0.509</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of parents’ love</td>
<td>0.684</td>
<td></td>
<td>0.726</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Troubles in marriage/relationships</td>
<td>0.651</td>
<td></td>
<td>0.342</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father too severe</td>
<td>0.684</td>
<td></td>
<td>0.687</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Society</td>
<td>0.603</td>
<td>0.438</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too high expectations of parents</td>
<td>0.654</td>
<td></td>
<td>0.431</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overprotective mother</td>
<td>0.665</td>
<td>0.467</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental pollution</td>
<td>0.696</td>
<td></td>
<td>0.424</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of willpower</td>
<td>0.521</td>
<td>0.772</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too bright or too intelligent</td>
<td>0.444</td>
<td>0.444</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Influence of bad friends</td>
<td></td>
<td>0.475</td>
<td></td>
<td>0.620</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radiation</td>
<td>0.682</td>
<td>0.502</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lack of vitamins</td>
<td>0.572</td>
<td>0.410</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Too ambitious</td>
<td>0.354</td>
<td>0.498</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Punishment from God</td>
<td></td>
<td>0.826</td>
<td></td>
<td>0.509</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unfavorable horoscope</td>
<td></td>
<td>0.698</td>
<td></td>
<td>0.561</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
of schizophrenia as a whole. The second limitation is that we did not recruit a community-dwelling population for factor analysis. Third, data on several potential confounding factors were not obtained because of strict ethical considerations and a reluctance to share medical information. This limitation is important because interpersonal relationships between family members and the severity of schizophrenia symptoms may have influenced the results of this study. Finally, this study is limited by its cross-sectional design; thus, we cannot determine the beliefs of the patients before initiating medication.

Conclusion
Most Japanese patients believe that there are multifactorial causes for schizophrenia. Overall, these findings are consistent with the evidence that mental health literacy in Japan has improved with increases in beliefs about both psychosocial and biogenetic causes of illness and decreases in causal beliefs relating to weakness of character.

Acknowledgment
This study was funded by a Grant-in-Aid for Scientific Research (KAKENHI) from the Japan Society for the Promotion of Research JSPS, 15H04754 (Principal Investigator Norio Yasui-Furukori). The funders had no role in the study design, data collection and analysis, the decision to publish, or the preparation of the manuscript.

Disclosure
The authors declare that they have no direct conflicts of interest relevant to this study. Norio Yasui-Furukori has
been a speaker for Sumitomo Dainippon Pharma, Mochida Pharmaceutical, Otsuka Pharmaceutical, and Merck Sharp & Dohme in Japan for other studies.

References