Expressed emotion and associated factors among care givers of schizophrenia patient attending mental health service in Dilla University Refferal Hospital, Dilla, Southern Ethiopia, 2022

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Abstract

Background: Expressed emotion (EE) is an attitude, feeling, or behavior based on the emotional responses of the family caregiver in response to and reaction towards the ill family members. This concept has long been used to investigate the family environment of patients with mental disorders which reflects the extent to which family members close to a patient express critical comments, hostile and emotionally over-involved attitudes or warmth when talking about the patient. Given the paucity of research on this subject in Ethiopia and the area under study, it is important to evaluate caregivers of schizophrenic patients’ expressed emotion and the elements that are related to it.

Objective: To assess prevalence of expressed emotion and associated factors among care givers of schizophrenic patient attending mental health service in DURH, Dilla, and southern Ethiopia.

Method and material: An institution-based cross-sectional study design was employed at DURH psychiatry clinic. Data was collected using face to face interview by interviewer administered questionnaire by using a mobile software epi.INFO version 7 and medical chart review was used to take the diagnosis of the patient and any comorbid disorder. Systematic random sampling was used to collect sample. The collected data was exported to SPSS version 22 for analysis, Bivariate and multivariable logistic regression analysis was conducted to identify associated factors of expressed emotion among caregivers of schizophrenic patient attending mental health service in DURH. The statistical significance was set at P-value <0.05.

Result: High expressed emotion was observed in 50.5% (43.1-57.4) of respondents. Caring for schizophrenic patients for about 6-8 years (AOR=3.5; 95%CI: 2.1-6.3), being female caregiver (AOR=1.2; 95%CI: 1.15-4.1), caregiver moderate to severe overload (AOR=2.0; 95%CI: 1.81-5.4) and 6-10 years total duration of illness (AOR=1.6; 95%CI: 1.42-3.9) were significantly associated with high expressed emotion.

Conclusion: Since the present study reported high level of EE in almost half family members, there is need for psychosocial nursing care for every family members of schizophrenia patient which will help them to effectively cope with the stress of managing the mentally ill family member at home.

Introduction

Expression emotion (EE) is an attitude, mood, or conduct that is based on the family caregiver's emotional reactions to and toward the unwell family members (1). It consists of three components: the presence of critical comments (CC), which relate to a negative assessment of the patient's behavior; hostility (H), which relates to a negative conception of the patient as a person; and emotional over-involvement (EOI), which describes feelings or attitudes such as desperation, self-sacrifice, and excessive protection of the patient on the part of family members. Given that hostility (H) and the CC share a lot of similarities, the EE are primarily based on the CC and EOI. (2, 3)
A severe and persistent mental disorder called schizophrenia is characterized by substantial changes in thought, perception, mood, and social behavior. Schizophrenia frequently makes it difficult for a person to function normally in daily life, their job, and their social life. (4, 5) Families now provide the majority of the care for those with serious mental illnesses, such as psychotic disorders, since 1990. A positive prognosis for the patient with psychosis depends on early family involvement in the healing process, as well as pharmacological treatment and other psychosocial therapies. However, the family environment can also have a detrimental impact on how the illness develops. (2)

Although there are a number of schizophrenic patients in Ethiopia and visiting DURH, studies done on expressed emotion in our country are very limited and yet not done in this study area until the completion of this study. In addition to this, based on my advisor suggestion I become interested to assess the prevalence of expressed emotion and its associated factors among caregivers of schizophrenic patient attending mental health service in DURH.

Schizophrenia is one of the most common of the severe mental disorders worldwide. It is ranked among the top 25 causes of disability, in which expressed emotion of caregivers is the first & most common cause for this negative impact on the patient across the world. Researchers found that relapse rate in high expressed emotion group is much higher than low expressed emotion. (6)

In developing countries, most of the PLWS stay with their immediate family members, who are expected to support them in seeking treatment and taking their drugs. Family environment plays a crucial role in influencing the onset, as well as course of mental illness particularly that of schizophrenia and other related psychotic disorders. This involvement of family has a good side for a better prognosis of the illness but in the other side it may have a negative impact on the course of the illness. (7)

Findings from previous studies have shown that severity of illness, patient’s age, higher number of previous episodes in the patient and sex, degree of kinship, daily time spent together, caregiving burden, duration of giving care in the caregivers are some of the factors that contributed to high level of expressed emotion in caregivers of schizophrenic patients. (1, 2, 5, 6, 8)

Caregivers’ attitude plays a vital role in high expressed emotion. Existing literature demonstrates that, caregivers have inadequate knowledge on schizophrenia and its various treatment aspects. As a result it influences the caregiver’s attitude towards the mentally ill family member which could probably be bad prognostic factor. Numerous studies also found that the consequence of high expressed emotion leads to relapse and acts as a maintaining factor, which usually influences the clinical outcome and majority of the studies have indicated as a solution that psychosocial interventions along with the pharmacotherapy would provide better outcome and help in mainstreaming the persons with illness at the earliest. (6, 9–12)

Additionally researches has shown that adequate psychoeducation program about the mental illness and importance of family support can be taught to family members and patients to increase their knowledge
and decrease expressed emotion, which will help the patient in reducing the chances of relapse and rehabilitation cycle and to live an independent life. (13)

**Methods**

**Study area and period**

This study was conducted at Dilla University Referral Hospital from Aug 15 to Nov 15, 2022, which is found in Dilla town, Gedeo zone, SNNPR, Ethiopia. DURH is established in 1977 E.C/1985 G.C as zonal Hospital in Gedeo Zone with former name of Dilla Hospital until June 11/2001 E.C that changed in to DURH. It is located 360 Km from A.A (capital city of Ethiopia) and 90 Km from Hawassa (the capital city of SNNPR). It provides curative and rehabilitative services for about 2 million catchment populations. At the same time of its establishment, about 154 staffs were present, of them 104 were health professionals and the remaining were supportive staffs. Now they have 5 wards, Medical, Surgical, OBY/GYN, pediatrics & Psychiatry. The Hospital services around 3 million peoples from which 95% belong to Gedeo ethic group (14).

**Study design**

An institutional-based quantitative cross-sectional study design was employed at DURH to assess the prevalence and associated factors of expressed emotion among caregivers of schizophrenic patients.

**Study population**

Source population

All care givers who are giving care for schizophrenic patients at DURH.

Study population

Care givers of schizophrenic patients at DURH and who were available during data collection period.

**Eligibility criteria**

Inclusion criteria

Care givers who were giving care for schizophrenic patients and age 18 and above were included in the study.

Exclusion criteria
Care givers who were not competent to give information due to difficulty of communication and critically ill during data collection period was excluded from the study.

**Sample size calculation**

The sample size required for the study calculated using a single population proportion formula by considering an estimated prevalence of expressed emotion to be 43.6%, from the study conducted in Jimma university medical center psychiatry out-patient unit, south west Ethiopia (15), a 5% margin of error, a 95% confidence interval, and 10% non-response rate.

\[
n = \frac{Z^2 \times P(1 - P)}{d^2}
\]

Where,

- \( n \) is the sample size,
- \( P \) is expected prevalence (proportion) of Expressed Emotion,
- \( d \) = margin of error and
- \( Z \) = standard score which corresponds to 1.96.

Therefore the total sample size is determined by using the above formula,

Where:

- \( P = 43.6\% = 0.436 \)
- \( Z = 1.96 \) at 95%CI
- \( d = 5\% (0.05) \)

\[
n = \frac{Z^2 \times P(1 - P)}{d^2} = \frac{1.96^2 \times 0.436(1 - 0.436)}{0.05^2} = 377.86 \sim 378
\]

By considering 10% non-response rate the final sample size is \( n = 415.8 \sim 416 \)

Since, the total population is < 10,000 (358) using a correction formula: \( n = \frac{n}{1 + \frac{n}{N}} = \frac{416}{1 + \frac{416}{358}} = 201.82 \sim 202 \) is corrected sample size \((n_c)\) of the study.

**Sampling technique**
Systematic random sampling was used to select participants and sampling fraction is determined by dividing total study population (392) by total sample size (202) which gives as (1.94). Therefore, participants were selected from caregivers of schizophrenic patients who visited DURH during the period of data collection on the interval of (2). The selected participants were directed by the hospital staff to the office assigned to the researcher as they arrived for a psychiatric visit.

**Study variable**

**Dependent variable**

Expressed Emotion

**Independent variable**

**Care givers burden (Zarit burden interview)**

**Care givers Socio-demographic factors:**

Age, Gender, Ethnicity, Educational status, Occupation, Average household monthly income, Residence, Relationship with patient, Family size, Distance from Hospital in km, Duration of giving care, Daily time spent together and Known comorbid physical illness.

**Socio-demographic factors of patients:**

Age, Gender, Marital status, Educational status, Occupation

**Clinical factors of the patients:**

First onset of illness, Number of episodes, Hospital admission, Number of admission, Duration of untreated psychosis, Total duration of illness & Comorbid diagnosis

**Operational definition**

Low EE: family members scoring < 23 for the CC domain and < 29 for the EOI domain were considered as having low EE and also High EE: family members who have either high CC or high EOI were considered as having high EE. (1, 16)

No overload: a person who scores total score of ZBI lower than 21.
Mild to moderate overload: a person who scores total score of ZBI between 22 and 40.

Moderate to severe overload: a person who scores total score of ZBI between 41 and 60.

Intense overload: a person who scores total score of ZBI values higher than 61. (15, 17)

**Data collection tool/instrument**

A structured questionnaire developed after reviewing related literatures was used to collect data about caregivers and patient socio-demographic variable and patient's clinical variables and last psychiatric diagnosis was taken from medical records of patients.

The FQ was used to evaluate the level of EE and its CC and EOI components. This instrument was developed and validated by Wiedemann, Rayki, Feinstein, and Hahlweg in 2002, and contains 20 items, divided into two domains – CC (10 items – 2, 4, 6, 8, 10, 12, 14, 16, 18, 20) and EOI (10 items – 1, 3, 5, 7, 9, 11, 13, 15, 17, 19) with each maximum value 40 points. The items in the two domains reflect different situations that the family members use to cope with their daily problems. To complete the questionnaire, the family members had to indicate how frequently they deal with the schizophrenia patients in determined situations. Possible responses are never or very rarely, rarely, frequently and very frequently, ranging from one to four, for each item. Respondents should provide only one response for each item. The higher the score, the greater the number of critical comments, and the greater the emotional over involvement of the family members. The cut-off values on the FQ determined by the author of the original version of the instrument were, CC = 23, and EOI = 27. (16)

Zarit Burden Interview (ZBI), a valid and reliable instrument for assessing caregiver burden, consisting of 22 items with scores ranging from zero to four was used to assess care giver burden in this study. The overall score ranges from zero to 88 and the higher the score, the higher the perception of overload. In this study ZBI score was computed as a numerical variable.

**Data collection procedure**

Data was collected using face to face interview by interviewer administered questionnaire designed in English language by using a mobile software epi.INFO version 7 and medical chart review was done to take the diagnosis of the patient and any comorbid disorder. It was structured as closed ended and was developed and adapted after review of relevant literatures and arranged according to particular objective it can address. The data collection was carried out by two trained data collectors, who are trained hardly before the data collection.

**Data quality management**
To assure the data quality great emphasis was given in designing data collection instruments. The questionnaires was developed in English and then translated into Amharic and during entering in epi.INFO it is back translated to English to maintain consistency. The collected data was reviewed and checked by epi.INFO version 7 for completeness before exporting data to SPSS. The respondents were told that they do not have to tell their names.

**Data processing, analysis & presentation**

The coded Data was checked and cleaned by epi.INFO version 7 and then exported into Statistical Package for the Social Sciences (SPSS window version 22.0) for analysis.

Prevalence of EE and descriptive statistics of caregivers & patients socio-demographic & clinical characteristics were elaborated using frequencies, mean, standard deviation & pie chart. Bivariate analysis was performed to determine how each of the independent variables are associated with the dependent variable. Then only variables that have been found to be significantly associated with EE during bivariate analysis (with p-value < 0.25) was entered into the multivariate analysis. A p-value of < 0.05 was considered as statistically significant in multivariate analysis.

**Result**

**Socio-demographic characteristics of caregivers**

A total of 202 care givers of patient with schizophrenia were participated in the study with response rate of 100%. Among study participants, 120 (59.4%) were males and majority, 132 (65.3%) were married. Mean age of participants was 35 years (SD ± 17.4) and 58 (28.7%) were parents. Nearly one-fifth (21.3%) of respondents attended primary education. Regarding occupation of the respondents, 27 (13.4%) was farmer. More than half of the respondents, 105 (52.0%) live in urban areas, 91 (45.0%) live in distance of ≤ 8 km from the Hospital and monthly income of 156 (77.2%) care givers was > 2000 ETB (See Table 1).
Table 1
Socio-demographic characteristics of caregiver of patient with schizophrenia at DURH psychiatry clinic, Southern Ethiopia 2022 (n = 202)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>18–27</td>
<td>51</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td>28–37</td>
<td>71</td>
<td>35.1</td>
</tr>
<tr>
<td></td>
<td>38–47</td>
<td>72</td>
<td>35.6</td>
</tr>
<tr>
<td></td>
<td>&gt; 47</td>
<td>8</td>
<td>4.1</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>120</td>
<td>59.4</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>82</td>
<td>40.6</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>48</td>
<td>23.8</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>132</td>
<td>65.3</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>13</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td>9</td>
<td>4.5</td>
</tr>
<tr>
<td>Educational status</td>
<td>Primary education</td>
<td>43</td>
<td>21.3</td>
</tr>
<tr>
<td></td>
<td>Secondary education</td>
<td>34</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>Higher education &amp; above</td>
<td>125</td>
<td>61.9</td>
</tr>
<tr>
<td>Occupation</td>
<td>Student</td>
<td>54</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>House wife</td>
<td>16</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>27</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>Merchant</td>
<td>39</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>Gov’t employee</td>
<td>28</td>
<td>13.9</td>
</tr>
<tr>
<td></td>
<td>Private employee</td>
<td>22</td>
<td>10.9</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>16</td>
<td>7.9</td>
</tr>
<tr>
<td>Average house hold monthly income in ETB</td>
<td>201–1000</td>
<td>15</td>
<td>7.4</td>
</tr>
<tr>
<td></td>
<td>1001–2000</td>
<td>31</td>
<td>15.3</td>
</tr>
<tr>
<td></td>
<td>&gt; 2000</td>
<td>156</td>
<td>77.2</td>
</tr>
<tr>
<td>Place of residence</td>
<td>Rural</td>
<td>97</td>
<td>48.0</td>
</tr>
</tbody>
</table>

*Others, Half siblings and far relatives
<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td></td>
<td>105</td>
<td>52.0</td>
</tr>
<tr>
<td>Relation to the patient</td>
<td>Parent</td>
<td>58</td>
<td>28.7</td>
</tr>
<tr>
<td></td>
<td>Child</td>
<td>32</td>
<td>15.8</td>
</tr>
<tr>
<td></td>
<td>Siblings</td>
<td>26</td>
<td>12.9</td>
</tr>
<tr>
<td></td>
<td>Aunt/Uncle</td>
<td>14</td>
<td>6.9</td>
</tr>
<tr>
<td></td>
<td>Spouse</td>
<td>51</td>
<td>25.2</td>
</tr>
<tr>
<td></td>
<td>Others*</td>
<td>21</td>
<td>10.4</td>
</tr>
<tr>
<td>Distance from the hospital in KM</td>
<td>&lt;=8KM</td>
<td>91</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>9-23KM</td>
<td>61</td>
<td>30.2</td>
</tr>
<tr>
<td></td>
<td>24-50KM</td>
<td>27</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>&gt;50KM</td>
<td>23</td>
<td>11.4</td>
</tr>
</tbody>
</table>

*Others, Half siblings and far relatives

**Socio-demographic characteristics of patients**

The mean age of the patient was 40 years and more than half, 168 (83.2%) of the patients age was 25 and above. Nearly half, 106 (52.5%) patients were males. About one-third 76 (37.6%) of patients were single and nearly half, 103 (51.0%) were married. Sixty (29.7%) of patients attended higher education & above and 27 (13.4%) were unemployed. (See Table2)
Table 2
Socio-demographic characteristics of patients with schizophrenia at DURH psychiatry clinic, Southern Ethiopia 2022 (n = 202)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>15–24</td>
<td>34</td>
<td>16.8</td>
</tr>
<tr>
<td></td>
<td>25–34</td>
<td>91</td>
<td>45.0</td>
</tr>
<tr>
<td></td>
<td>35–44</td>
<td>52</td>
<td>25.7</td>
</tr>
<tr>
<td></td>
<td>&gt; 44</td>
<td>25</td>
<td>12.4</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>106</td>
<td>52.5</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>96</td>
<td>47.5</td>
</tr>
<tr>
<td>Marital status</td>
<td>Single</td>
<td>76</td>
<td>37.6</td>
</tr>
<tr>
<td></td>
<td>Married</td>
<td>103</td>
<td>51.0</td>
</tr>
<tr>
<td></td>
<td>Divorced</td>
<td>16</td>
<td>7.9</td>
</tr>
<tr>
<td></td>
<td>Widowed</td>
<td>7</td>
<td>3.5</td>
</tr>
<tr>
<td>Educational status</td>
<td>Not able to read &amp; write</td>
<td>23</td>
<td>11.4</td>
</tr>
<tr>
<td></td>
<td>Only able to read &amp; write</td>
<td>21</td>
<td>10.4</td>
</tr>
<tr>
<td></td>
<td>Primary education</td>
<td>44</td>
<td>21.8</td>
</tr>
<tr>
<td></td>
<td>Secondary education</td>
<td>54</td>
<td>26.7</td>
</tr>
<tr>
<td></td>
<td>Higher education &amp; above</td>
<td>60</td>
<td>29.7</td>
</tr>
<tr>
<td>Occupation</td>
<td>Student</td>
<td>43</td>
<td>21.3</td>
</tr>
<tr>
<td></td>
<td>House wife</td>
<td>38</td>
<td>18.8</td>
</tr>
<tr>
<td></td>
<td>Farmer</td>
<td>12</td>
<td>5.9</td>
</tr>
<tr>
<td></td>
<td>Merchant</td>
<td>35</td>
<td>17.3</td>
</tr>
<tr>
<td></td>
<td>Gov’t employee</td>
<td>17</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Private employee</td>
<td>17</td>
<td>8.4</td>
</tr>
<tr>
<td></td>
<td>Unemployed</td>
<td>27</td>
<td>13.4</td>
</tr>
<tr>
<td></td>
<td>Retired</td>
<td>7</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Clinical characteristics of patients

Out of the total patients, 30 (14.9%) had co-morbid neuropsychiatric, substance use and medical disorder. The mean duration of illness was 9.53 (SD ± 4.35) years and the mean age of first onset of illness was
23.28 (SD ± 10.45) years. On the other hand, 70 (34.7%) had 1–2 episodes. 56 (27.7%) of patients has no history of admission and among those who had history of admission 67 (33.2%) of patients were admitted 4 times. (See Table 3).

Table 3  
Clinical characteristics of patients with schizophrenia at DURH psychiatry clinic, Southern Ethiopia 2022 (n = 202)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category</th>
<th>Frequency (n)</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First onset of illness</td>
<td>&lt;=18yrs</td>
<td>33</td>
<td>16.3</td>
</tr>
<tr>
<td></td>
<td>19-23yrs</td>
<td>86</td>
<td>42.6</td>
</tr>
<tr>
<td></td>
<td>24-30yrs</td>
<td>63</td>
<td>31.2</td>
</tr>
<tr>
<td></td>
<td>&gt;30yrs</td>
<td>20</td>
<td>9.9</td>
</tr>
<tr>
<td>Number of episode</td>
<td>1-2episode</td>
<td>70</td>
<td>34.7</td>
</tr>
<tr>
<td></td>
<td>3-4episode</td>
<td>80</td>
<td>39.6</td>
</tr>
<tr>
<td></td>
<td>&gt;4episode</td>
<td>52</td>
<td>25.7</td>
</tr>
<tr>
<td>Hospital admission</td>
<td>Yes</td>
<td>146</td>
<td>72.3</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>56</td>
<td>27.7</td>
</tr>
<tr>
<td>Number of admission</td>
<td>None</td>
<td>56</td>
<td>27.7</td>
</tr>
<tr>
<td></td>
<td>1 admission</td>
<td>29</td>
<td>14.4</td>
</tr>
<tr>
<td></td>
<td>2 admission</td>
<td>10</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>3 admission</td>
<td>40</td>
<td>19.8</td>
</tr>
<tr>
<td></td>
<td>4 admission</td>
<td>67</td>
<td>33.2</td>
</tr>
<tr>
<td>Total duration of illness</td>
<td>&lt;=2yrs</td>
<td>39</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>3-5yrs</td>
<td>42</td>
<td>20.8</td>
</tr>
<tr>
<td></td>
<td>6-10yrs</td>
<td>60</td>
<td>29.7</td>
</tr>
<tr>
<td></td>
<td>&gt;10yrs</td>
<td>61</td>
<td>30.2</td>
</tr>
<tr>
<td>Comorbid diagnosis</td>
<td>Yes, specify if yes*</td>
<td>30</td>
<td>14.9</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>172</td>
<td>85.1</td>
</tr>
</tbody>
</table>

*Specify if yes, neuropsychiatric, substance use and medical disorder

Status of expressed emotions among caregivers of patient with schizophrenia
Of the total study participants, 71 (35.1%) reported high critical comments (CC) and 94 (46.5%) reported high emotional over involvement (EOI). (See Table 4).

| Table 4 |
|-----------------|-----------------|-----------------|------------------|
| Variable        | Category         | Frequency (n)   | Percent (%)      |
| Critical comments | High critical comments | 71              | 35.1             |
|                 | Low critical comments | 131             | 64.9             |
| Emotional over involvement | High emotional over involvement | 94              | 46.5             |
|                 | Low emotional over involvement | 108             | 53.5             |

Over all, the status of expressed emotion among caregivers as measured by considering either high CC or high EOI is 102 [50.5% (43.1–57.4)] had higher expressed emotion. (See Fig. 1)

**Factors associated with expressed emotions among caregivers of patient with schizophrenia**

Simple binary logistic regression analysis result showed that, age, sex, residence, care giving duration & burden of care givers and care giver sex, marital status, first onset of illness, & total duration of illness of patients were found to be significantly associated with expressed emotion.

**Multivariate analysis**

As shown in the table below, caregiver age, caregiver sex, caregiver residence, duration of care giving, patient sex, patient marital status, first onset of illness, total duration of illness and caregiver burden were included in the final model. In multivariate analysis only caregiver sex, duration of care giving, total duration of illness and caregiver burden were retained as associated factor for expressed emotion. (See Table 5)
Table 5
Factors associated in bivariate & multivariate regression at DURH psychiatry clinic, Southern Ethiopia 2022 (n = 202)

<table>
<thead>
<tr>
<th>Variable</th>
<th>n(%)</th>
<th>Expressed emotion</th>
<th>COR (95%CI)</th>
<th>AOR (95%CI)</th>
<th>P-value (&lt; 0.05)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>High n(%)</td>
<td>Low n(%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver Sex</td>
<td>120(59.4)</td>
<td>50(41.7)</td>
<td>70(58.3)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Male</td>
<td>82(40.6)</td>
<td>52(63.4)</td>
<td>30(36.6)</td>
<td>1.4(1.2–4.7)</td>
<td>1.2(1.15–4.1)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of CG</td>
<td>65(32.2)</td>
<td>36(55.4)</td>
<td>29(44.6)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>≤ 2 years</td>
<td>50(24.8)</td>
<td>30(60)</td>
<td>20(40)</td>
<td>0.8(0.3–1.7)</td>
<td>2.1(0.8–6.6)</td>
</tr>
<tr>
<td>3–5 years</td>
<td>48(23.8)</td>
<td>23(47.9)</td>
<td>25(52.1)</td>
<td>2.4(1.1–5.6)</td>
<td>3.5(2.1–6.3)</td>
</tr>
<tr>
<td>6–8 years</td>
<td>39(19.3)</td>
<td>13(33.3)</td>
<td>26(66.7)</td>
<td>1.3(0.6–2.8)</td>
<td>1.5(0.3–5.7)</td>
</tr>
<tr>
<td>&gt; 8 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duration of illness</td>
<td>39(19.3)</td>
<td>14(35.9)</td>
<td>25(64.1)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>≤ 2 years</td>
<td>42(20.8)</td>
<td>28(66.7)</td>
<td>14(33.3)</td>
<td>0.3(0.1–0.7)*</td>
<td>0.2(0.01–1.4)</td>
</tr>
<tr>
<td>3–5 years</td>
<td>60(29.7)</td>
<td>36(60)</td>
<td>24(40)</td>
<td>3.4(1.2–3.8)</td>
<td>1.6(1.42–3.9)</td>
</tr>
<tr>
<td>6–10 years</td>
<td>61(30.2)</td>
<td>24(39.3)</td>
<td>37(60.7)</td>
<td>0.9(0.3–1.9)</td>
<td>0.03(0.01–0.9)</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caregiver burden</td>
<td>20(9.9)</td>
<td>15(75)</td>
<td>5(25)</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>No overload</td>
<td>143(70.8)</td>
<td>68(47.5)</td>
<td>75(52.5)</td>
<td>2.8(0.8–9.4)</td>
<td>0.07(0.01–1.2)</td>
</tr>
<tr>
<td>Mild to moderate</td>
<td>37(18.3)</td>
<td>19(51.4)</td>
<td>18(48.6)</td>
<td>3.3(1.1–9.5)</td>
<td>2.0(1.81–5.4)</td>
</tr>
<tr>
<td>Moderate to severe</td>
<td>2(1.0)</td>
<td>0(0)</td>
<td>2(100)</td>
<td>4.8(0.000)</td>
<td>0.03(0.01–1.9)</td>
</tr>
</tbody>
</table>

NB: *=p-value < 0.25 significantly associated in bivariate analysis
**= p-value < 0.05 significantly associated in multivariate analysis 1 = reference value

Discussion

A total of 202 caregivers of patients with schizophrenia were included in this study. The proportion of high expressed emotion (EE) in this study was 50.5% which is in-line with a similar studies conducted in
Hong Kong (50.9%), Thailand (53.77%), Pakistan (48.51%), Kano, Nigeria (52%), Lagos, Nigeria (50%) and Jima, Ethiopia (43.6%). (1, 5, 7, 8, 10, 11)

However, the prevalence of EE found on our study was less than a cross sectional study finding done in United Kingdom which is 60%. The difference might be due to very much small sample size on the study done in UK which was only 20 caregivers. (12)

On the other study carried out at a mental health outpatient clinic and two Psychosocial Care Centers in Brazil, with patients and relatives responding to the Family Questionnaire of the 89 family members, 68% caregivers had high expressed emotion. The difference could be due to the size of sample involved in the study done in Brazil which is 89 caregivers and the cultural difference between the two populations. (3)

Study done in India reported that only 21% of caregivers of patients with schizophrenia had high expressed emotion as compared to high expressed emotions in this study (50.5%). The difference could be due to using different assessment tool and variation in sample size since only 100 were involved in India's study which is lower than this study participant by nearly half. (18)

This study reported that being female caregiver was 1.2 times more likely to have high expressed emotion than being male caregiver which is similar with institutional based cross sectional study conducted in Lagos university teaching hospital, department of psychiatry, Nigeria (8). This may be because women tend to be more sympathetic and bear the majority of the burdens associated with providing care.

Regarding duration of taking care of the patient, those who give care for 6–8 years were 3.5 times more likely to have high expressed emotion than those who give care < 2 years which is higher than a study conducted in Jima 2.3 (1). This may be explained by the fact that people with schizophrenia may not be able to perform their everyday tasks alone, necessitating a greater reliance on their carers. As a result, family carers are prone to think that their lives are constantly interrupted.

The present study shown that patients whose total duration of illness was 6–10 years were 1.6 times more likely to have high expressed emotion than those whose total duration of illness was ≤ 2 years. Similar findings were concluded in study conducted in India in which caregivers of patients with long duration of illness are more likely to have high expressed emotion (6). This might be due to the bond to the caregiver is likely to grow as the length of the sickness does, and they will want more attention.

In addition to the above factors being significant determinants of EE, this study also reported care givers who had moderate to severe overload were 2.0 times more likely to have high expressed emotion than those who had no overload. A study conducted in Brazil also shown that the risk of high EE level increased with higher the ZBI score (OR = 1.16) (2).

Conclusion

The present study reported high level of EE in almost half family members, caregiver sex, duration of care giving, total duration of illness and caregiver burden were retained as associated factor for expressed
emotion.

**Abbreviations**

AOR – Adjusted odds ratio, CC – Critical comment, CCs – Critical comments, CFI – Camberwel family interview, DURH – Dila university referral hospital, EE – Expressed emotion, EOI – Emotional over involvement, FQ – Family questionnaire, H – Hostility, HEE – High expressed emotion, LEE – Low expressed emotion, LEES – Level of expressed emotion scale, PLWS – People living with schizophrenia, SMI – Severe mental illness, TEES – Thi expressed emotion scale, ZBI – Zarit burden interview

**Declarations**

**Ethical approval and consent to participate**

The proposal was reviewed and approved by the Institutional Review Board (IRB) of Dilla University College of Health Sciences and medicine. Submission of ethical approval letter of the board was given for all concerned bodies and permission was obtained from all departments. After the purpose and objectives of the study have been informed, oral and written assent and informed consent form was obtained from each study participants (care givers), before the start of data collection. To assure the anonymity of the respondents they were informed that they can withdraw from the study at any time and to maintain confidentiality of information respondents were told that they can hide their names. All necessary methods were carried out in accordance with the guidelines of institutional and declaration of Helsinki.

**Consent for publication**

Not applicable

**Availability of data and materials**

The datasets generated and/or analyzed during the current study are not publicly available due to preserving participant anonymity but are available from the corresponding author on reasonable request (Anteneh Gashaw, antenehgashaw77@gmail.com).

**Competing interests**

All authors assert that they have no competing interests

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**Authors' contributions**
YS designed the study, was involved in data collection, analysis, and interpretation of the result and drafted the paper, and participated in preparing all versions of the manuscript. AG, YA, DK, MM, MN and MK assisted in the design and the proposal development, monitored data collection, assisted during analysis, and revised subsequent drafts of the paper. All authors read and approved the final manuscript.

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Figures
Figure 1

Prevalence of expressed emotion at DURH psychiatry clinic, Southern Ethiopia 2022 (n=202)