Distress related to psychotic experiences: Enhancing the World Health Organization Composite International Diagnostic Interview psychosis screen

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Distress related to psychotic experiences: Enhancing the world health organization composite international diagnostic interview psychosis screen

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Abstract
Background: The abbreviated version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) psychosis screen tends to yield high prevalence in online samples. Psychotic Experiences (PE) may not necessarily indicate current or imminent psychopathology; however, distressing PE appear to be more clinically informative.

Methods: We analyzed data collected from an online survey administered to a Qualtrics panel (N = 2522 adults). Using multivariable logistic regression, we examined the association between PE (with and without associated distress) and several mental health outcomes, adjusting for age, gender, and race/ethnicity.

Results: Individuals with distressing PE had greater odds of most mental health outcomes when compared with individuals with non-distressing PE. This was true for being in mental health treatment, loneliness, probable mental illness, suicidal ideation, and suicide attempt, adjusting for age, gender, race/ethnicity, and education level. The only exception was for hazardous alcohol use, for which there was no significant association with distressing PE.

Conclusion: As screening for PE gains traction in public health and preventive medicine, using an abbreviated version of the WHO CIDI psychosis screen may be clinically informative, especially when eliciting the distressful nature of PE.

KEYWORDS
CIDI, distress, psychosis, psychotic experiences, WHO

1 | INTRODUCTION

Psychotic Experiences (PE) are sub-threshold hallucinations and delusions that occur in the general population at a rate far greater than psychotic disorders (Linscott & Van Os, 2010; Staines et al., 2022). In the US, the lifetime prevalence of PE in 2002-2004 among adults was just over 9% (Kessler et al., 2005). These estimates were established using the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI) 3.0 psychosis screen, which comprises six items: two types of hallucinations (visual and auditory) and
four types of delusions (thought insertion/withdrawal, thought control, reference, and persecutory), none of which should occur while dreaming, half asleep, or under the influence of alcohol or drugs. Endorsing at least one of these experiences constituted having a lifetime psychotic experience. The prevalence of 9% in the US was estimated using trained lay interviewers and probability sampling (Heeringa et al., 2004). Subsequently, the WHO CIDI 3.0 psychosis screen has been administered in the World Mental Health Surveys, which found a lifetime prevalence of 5.8% across 18 countries, with prevalence varying by country (McGrath et al., 2015).

A shorter WHO CIDI psychosis screen was administered in the World Health Surveys (WHO) in 2002–2004, which found a pooled lifetime prevalence of over 13% in 70 countries world-wide. The abbreviated psychosis screen consisted of four items: a single item on hallucinations, and three delusions (mood, reference, thought control). This version has often been used for its brevity and minimal burden imposed on respondents. However, online survey studies using this version have consistently yielded a much higher prevalence of PE. For example, in the American Life Panel, the lifetime prevalence of PE was 18% in a representative sample of the general adult population that used probability-based sampling. Other non-probability samples have yielded higher prevalence as well. In a large convenience sample of students in higher education in the Healthy Minds Study (2020–2021), the prevalence of lifetime PE across campuses in the US was nearly 30% (Oh, Banawa, et al., 2022). In the Survey of Police–Public Encounters, around a quarter of the sample reported a 12-month psychotic experience (DeVylder et al., 2017).

Most people who report PE will not develop a psychotic disorder; however, some studies have shown that PE associate with an increased risk for persistent psychosis (Dominguez et al., 2011). Still, a growing and compelling body of literature shows that PE are associated with a host of negative outcomes, including mental health problems (DeVylder et al., 2014), chronic health conditions (Oh et al., 2019; Oh, Waldman, et al., 2018), disability (Navarro-Mateu et al., 2017; Oh, Koyanagi, et al., 2018), behavioral problems (Koyanagi et al., 2016; Koyanagi & Stickley, 2015; Oh, Koyanagi, et al., 2016; Oh, Singh, et al., 2016), suicidal thoughts and behaviors (DeVylder et al., 2020; Jay et al., 2022; Oh, Koyanagi, et al., 2022; Yates et al., 2019), and reduced lifespan (Sharifi et al., 2015). As such, PE may play a role in screening, prevention, and early intervention not only for psychotic disorders but also other adverse health outcomes (Oh, DeVylder, et al., 2021).

The higher prevalence of PE using the abbreviated version of the WHO CIDI psychosis screen raises concerns about the sensitivity of the measure, and whether estimates are potentially inflated by capturing normative experiences. Emerging research has shown that it is actually the persistent and distressing nature of PE that may be particularly linked to negative outcomes (Karcher et al., 2022), whereas unusual experiences that are not distressing may not necessarily have clinical significance. Inflating psychopathology rate estimates may also perpetuate unnecessary stigma and shame regarding phenomena that may be part of the normal range of diverse human experiences. However, the WHO CIDI psychosis screen does not elicit any information about potential distress associated with the experiences. Thus, in this study, we explored the potential clinical value of eliciting distress related to PE with respect to mental health outcomes.

2 | METHODS

2.1 | Sample

Respondents were recruited through Qualtrics, an online survey platform that maintains a database of several million U.S. residents who have volunteered to participate in periodic survey-based research. Participants who completed the survey were financially compensated with the amount that was agreed upon with their original panel source. The only inclusion criterion was to be 18 years or older; no other exclusion criteria were employed. Participants who did not complete the survey in full were excluded. Of 5219 panel members who accessed the survey landing page, 2550 (48.9%) subsequently completed the survey. This survey study was reviewed and approved by the Institutional Review Board of Ben-Gurion University of the Negev. Data were collected in July 2022.

2.2 | Measures

Psychotic experiences (predictor). Psychotic experiences were assessed using an abbreviated version of the WHO psychosis screen. Respondents were asked about: (1) A feeling that something strange and unexplainable was going on that other people would find hard to believe? [i.e., delusional mood] (2) A feeling that people were too interested in you or that there was a plot to harm you? [i.e., persecutory delusion] (3) A feeling that your thoughts were being directly interfered with or controlled by another person, or your mind was being taken over by strange forces? [i.e., thought control] (4) An experience of seeing visions or hearing voices that others could not see or hear when you were not half asleep, dreaming, or under the influence of alcohol or drugs? [i.e., hallucination]. Having at least one of these experiences constituted having a lifetime psychotic experience. Respondents who endorsed at least one psychotic experience were also asked “Have any of these experiences caused you distress?” Using this item, we were able to create a variable indicating non-distressing PE versus distressing PE.

Mental health treatment (outcome). Being in mental health treatment was assessed using the single (yes/no) item: Are you currently receiving professional mental health treatment (e.g., therapy or counseling)?

Probable mental illness (outcome). The Kessler Distress Scale (Kessler et al., 2003) is a six-item scale assessing the presence of non-specific psychological distress in the last 30 days (mostly depression and anxiety symptoms, e.g., feeling hopeless, nervous, worthless). Items were rated on a 5-point Likert scale ranging from 0 (none of the time) to 4 (all of the time) and were summed into a scale ranging
from 0 to 24. This variable was dichotomized, with 13 and higher indicating probable mental illness (Kessler et al., 2003, 2005). Cronbach's alpha in the present study was excellent (α = 0.92).

Loneliness (outcome). Loneliness was measured using a three-item UCLA scale, which elicited information about experiences of loneliness (feeling left out, feeling isolated, lacking companionship). Response options included, only hardy ever, some of the time, and often, and items were summed (range 3–9) and dichotomized, with a score of six or higher indicating loneliness (Hughes et al., 2004). Cronbach's alpha was good (α = 0.81).

Hazardous alcohol use (outcome). Hazardous alcohol use was measured using the Alcohol Use Disorder Identification Test—Consumption (AUDIT-C; Bush et al., 1998), which elicits information about the frequency (how often, ranging from never to four or more times a week) and quantity (e.g., how many drinks on a typical day) of alcohol use and frequency of heavy drinking over the past year. Each item is rated on a 5-point Likert scale ranging from 0 to 4, and items are summed so that 12 is the maximum score. In men, a score of 4 or higher indicated hazardous alcohol use, while in women, a score of 3 or higher indicated hazardous alcohol use (Bush et al., 1998). These norms cut-offs were based on cis-gendered individuals.

Suicidal thoughts and behaviors (outcome). Two binary items asked participants whether they have ever seriously thought about attempting suicide and whether they have ever attempted suicide. Participants who marked “yes” on either item were also asked whether the suicidal thought or behavior occurred over past 12 months. In this study, we focused on suicidal thoughts and behaviors that occurred over the past 12 months.

Socio-demographic covariates. Sociodemographic information was collected through self-report items, including age (continuous), gender (man, woman, other), race/ethnicity (White, Black, Hispanic, Other), and education level (high school or less, some college, 4-year college or more). We adjusted for education level because both PE and mental health problems have been linked to socioeconomic status (Oh, Nagendra, et al., 2021). However, we acknowledge that socioeconomic status (e.g., education level) can be both a cause (social causation) and a consequence (social drift) of PE.

2.3 | Analysis

We created a categorical variable as follows: No PE, non-distressing PE, and distressing PE. With this categorical variable, we examined the associations between distressing PE and a range of mental health outcomes (being in mental health treatment, loneliness, hazardous drinking, probable mental illness, suicidal ideation, and suicide attempt), with individuals who did not have any PE serving as the reference group. We adjusted all models for age, gender, race/ethnicity, and education level. We present all findings as adjusted odds ratios with 95% confidence intervals.

Sensitivity analyses. We restricted the sample to those who reported 12-month PE, and then used multivariable logistic regression to examine the relations between distressing PE and mental health outcomes, using individuals with non-distressing PE as the reference group. We repeated this analysis using lifetime PE.

3 | RESULTS

Table 1 provides the sample characteristics for this online non-probability sample of adults. The sample was majority women (84.4%), and White (66.1%), with a mean age of 40. The lifetime prevalence of PE was 49.1%. About 15.1% of the sample reported distressing PE, and 33.9% reported non-distressing PE. The most common psychotic experience was delusional mood, followed by persecutory delusion. Overall, the sample had relatively high prevalence of mental health problems. For example, 57% of the sample reported significant loneliness. Delusional mood was less likely to be associated with distress related to PE, when compared with other types of PE.

Table 2 provides the multivariable logistic regression models. Across the board, individuals with distressing lifetime PE had greater odds of most mental health outcomes when compared with individuals with non-distressing PE. This was true for being in mental health treatment, loneliness, probable mental illness, suicidal ideation, and suicide attempt, adjusting for age, gender, race/ethnicity, and education level. The only exception was for hazardous alcohol use, for which there was no significant association with distressing PE. Distressing PE were associated with 2.41 times greater odds of being in mental health treatment, nearly six times greater odds of being lonely, over ten times greater odds of probable mental illness, over eight times greater odds of suicidal ideation over the past year, and 19 times greater odds of suicide attempt over the past year, when compared with individuals who did not have PE.

In sensitivity analyses we restricted the sample to only those who reported 12-month PE and examined the extent to which people with distressing 12-month PE had greater odds of mental health problems when compared with people with non-distressing 12-month PE (Table S1). Findings largely mirror the findings in Table 2 in that distressing PE were associated with greater odds of mental health problems, except with respect to hazardous alcohol use.

4 | DISCUSSION

4.1 | Main findings

In this study, we explored whether there was evidence that including an item on distress associated with PE might enhance the sensitivity of the measure. Nearly half of the non-probability sample reported any lifetime psychotic experience. Although online survey samples tend to have high rates of psychopathology (Ophir et al., 2020), these rates still seem unlikely to represent true prevalence of PE. Specifically, we found that the most common type of lifetime psychotic
experience was delusional mood, followed by persecutory ideation. Having a “feeling that something strange and unexplainable was going on that other people would find hard to believe” and a “feeling that people were too interested in you or that there was a plot to harm you” could reflect paranoia, but could also capture normative experiences, particularly in unstable or hostile environments. We found that these items drove up the lifetime prevalence of PE. The literature acknowledges the potential to misidentify pathological versus nonpathological paranoia (Sen & Chowdhury, 2006; Whaley, 2001), some of which may emerge from a legitimate distrust of psychiatric services (Metzl, 2010; Metzl & Hansen, 2014).

We explored potential modifications of the abbreviated WHO CIDI 3.0 Psychosis Screen by adding a single item asking whether any of the PE caused distress. We found that both non-distressing and distressing PE were associated with being in mental health treatment, being lonely, having probable mental illness, and having suicidal thoughts and behavior, with greater odds for distressing PE, when compared with those who did not endorse PE. Findings comport with prior studies that have highlighted the clinical value of asking about distress (Karcher et al., 2022). The only outcome that was not significantly associated with distressing PE was hazardous drinking, which was only significantly associated with non-distressing PE. The reason for this is unclear and may speak to the complex set of factors that drive hazardous drinking, including social mechanisms (Sudhinaraset et al., 2016).

Distressing PE may be more indicative of psychopathology than non-distressing PE, potentially because the distressing PE may contain negative content. Laroi and colleagues (Laroi et al., 2019) offer some insight into this explanation by identifying different factors that may drive negative content in auditory-verbal hallucinations, including adverse life experiences and the presence of social and physical threats. The negative content of PE may directly cause more distress; however, it is also possible that the negative content may derive from a toxic, invalidating, or deprived environment, which would strongly shape risk for psychopathology. Laroi and colleagues also identify culture as a potential driver of negative content.

### TABLE 1 Sample characteristics.

<table>
<thead>
<tr>
<th>Sociodemographic characteristics</th>
<th>N</th>
<th>Yes n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td>2,546</td>
<td></td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>35 (23, 55)</td>
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<tr>
<td>Mean (SD)</td>
<td>40 (18)</td>
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<tr>
<td>Range</td>
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<tr>
<td><strong>Race/Ethnicity</strong></td>
<td>2,546</td>
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</tr>
<tr>
<td>Black</td>
<td>397 (15.7%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>236 (9.3%)</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>1,684 (66.1%)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>229 (9.0%)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>2,546</td>
<td></td>
</tr>
<tr>
<td>Men (cisgender)</td>
<td>390 (15.3%)</td>
<td></td>
</tr>
<tr>
<td>Women (cisgender)</td>
<td>2,148 (84.4%)</td>
<td></td>
</tr>
<tr>
<td>Other (transgender, nonbinary, other)</td>
<td>8 (0.3%)</td>
<td></td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td>2,546</td>
<td></td>
</tr>
<tr>
<td>4-Year college or more</td>
<td>650 (25.5%)</td>
<td></td>
</tr>
<tr>
<td>High school or less</td>
<td>887 (34.8%)</td>
<td></td>
</tr>
<tr>
<td>Some college</td>
<td>1,009 (39.6%)</td>
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</table>

### TABLE 1 (Continued)

<table>
<thead>
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<th>Yes n (%)</th>
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</tr>
</tbody>
</table>

### Mental health outcomes

| Psychological distress (Kessler-6) | 2,512 | 815 (32.4%) |
| Hazardous alcohol use             | 2,538 | 790 (31.2%) |
| Loneliness                        | 2,509 | 1,431 (57.0%) |
| Receiving mental health treatment | 2,546 | 679 (26.7%) |
| Suicide ideation in past year     | 2,546 | 369 (14.5%) |
| Suicide attempt in past year      | 2,546 | 86 (3.4%) |

### Psychotic experiences

| Delusional mood                  | 2,535 | 1,081 (42.6%) |
| Persecutory delusion             | 2,537 | 573 (22.6%) |
| Mind control delusion            | 2,537 | 403 (15.9%) |
| Hallucinations                   | 2,541 | 417 (16.5%) |
| Any lifetime psychotic experiences| 2,518 | 1,236 (49.1%) |

### Lifetime psychotic experiences with/without distress

| No lifetime psychotic experiences | 1,282 (51.1%) |
| Lifetime psychotic experiences without distress | 851 (33.9%) |
| Lifetime psychotic experiences with distress | 378 (15.1%) |

### Delusional mood

| Without distress | 575 (54.6%) |
| With distress    | 489 (46.4%) |
TABLE 2  Multivariable logistic regression showing associations between lifetime psychotic experiences (PE) and mental health outcomes.

<table>
<thead>
<tr>
<th></th>
<th>In mental health treatment</th>
<th>Loneliness</th>
<th>Hazardous alcohol use</th>
<th>Probable mental illness</th>
<th>Suicidal ideation</th>
<th>Suicide attempt</th>
</tr>
</thead>
<tbody>
<tr>
<td>No PE</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Lifetime PE without distress</td>
<td>1.48***</td>
<td>1.96***</td>
<td>1.27*</td>
<td>3.10***</td>
<td>2.29***</td>
<td>3.75**</td>
</tr>
<tr>
<td></td>
<td>[1.19, 1.83]</td>
<td>[1.61, 2.37]</td>
<td>[1.04, 1.55]</td>
<td>[2.48, 3.86]</td>
<td>[1.68, 3.13]</td>
<td>[1.65, 8.50]</td>
</tr>
<tr>
<td>Lifetime PE with distress</td>
<td>2.41***</td>
<td>5.95***</td>
<td>1.17</td>
<td>10.33***</td>
<td>8.24***</td>
<td>19.01***</td>
</tr>
<tr>
<td></td>
<td>[1.85, 3.14]</td>
<td>[4.30, 8.25]</td>
<td>[0.90, 1.52]</td>
<td>[7.72, 13.84]</td>
<td>[5.93, 11.46]</td>
<td>[8.64, 41.79]</td>
</tr>
<tr>
<td>N</td>
<td>2511</td>
<td>2477</td>
<td>2503</td>
<td>2480</td>
<td>2511</td>
<td>2511</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.06</td>
<td>0.12</td>
<td>0.01</td>
<td>0.22</td>
<td>0.15</td>
<td>0.18</td>
</tr>
</tbody>
</table>

Note: Odds ratios with 95% Confidence Intervals are reported in brackets. All models adjusted for age, race/ethnicity, gender, and education level. Abbreviation: PE, Psychotic experiences.

* * * p < 0.001, ** p < 0.01, * p < 0.05.

potentially distress associated with PE may be conditional on how the larger socio-cultural environment understands and reacts to PE (e.g., normalizing the experiences vs. pathologizing the experiences). Finally, Laroi and colleagues also note that negative content of hallucinations may be related to emotion regulation strategies. Conceivably, people who have distressing PE may be less capable of managing the emotions in general, and difficulty with emotion regulation appears to relate to a range of psychopathology more broadly.

4.2 | Limitations

Our findings should be interpreted bearing in mind several limitations. First, in the absence of an experimental design, we could not make any causal inferences. Large studies have suggested that the associations between PE and mental health problems can be bi-directional (McGrath et al., 2016). It is possible that PE precede mental health problems, or vice versa, and assessing temporality and order of events can be complicated.

Second, in terms of sampling, we used a non-probability sample recruited online, which may have been biased to exclude individuals who do not have reliable access to the Internet or computers, and/or biased to include self-selected individuals interested in mental health. The sample was majority White and women, and was only administered in English, which would have excluded individuals with limited English proficiency (e.g., recent immigrants). There was a relatively high prevalence of psychopathology, which reflects a sampling bias where people with mental health problems may be selecting into these online panel survey studies. Additionally, it is possible that people who are unemployed or have low income may have been drawn to the incentives provided by the study. Nonetheless, the findings of this study appear to comport with other surveys conducted in the general population in other settings (Karcher et al., 2022), and future research should use probability sampling to minimize bias and ensure that findings are representative of the larger population.

Third, in terms of measurement, the WHO CIDI psychosis screen can benefit from modification. For example, information about the onset, frequency, and duration of experiences may elucidate the clinical significance of the PE. Further, only hallucinations specified that they should not occur in the context of sleep or substance use; however, it is possible that other delusions may have occurred while under the influence of drugs. Additionally, we only included a single item about whether any of the lifetime experiences caused any distress, and so future studies should use more elaborate and precise items of distress. Along these lines, it is possible that adding a distress item may overlap with the probable mental health measure (Kessler-6), and so disentangling non-specific psychological distress from the distress caused by PE is an important area of future research.

Finally, based on the WHS data, there appears to be inter-cultural variability in prevalence of PE across countries using the WHO CIDI 3.0 psychosis screen. It is unclear the extent to which the variability may be reduced or further exacerbated by adding a distress item, since the meaning of distress itself may be different across languages and cultures. However, this would also set an agenda to move the field toward better defining distress across populations.

4.3 | Implications

While the abbreviated WHO CIDI psychosis screen can expeditiously assess the presence of PE, it may also yield a high percentage of false positives as evidenced by the relatively high prevalence estimates when compared with large probability-based studies. An ongoing discussion around PE centers on how to reduce these false-positives and avoid pathologizing socially and culturally sanctioned experiences. Toward this end, our findings support the importance of this discussion as they further demonstrate the high prevalence of PE in online samples of adults in the general US population. In short, our findings suggest that modifications to the abbreviated WHO CIDI psychosis screen may make the measure more sensitive to clinically
significant PE. First, we found a high prevalence of delusional mood and persecutory delusion, making these items potential culprits of false positives. It may be useful to add a question stem to impress upon respondents that PE should refer only to perceptual abnormalities and ideations that are unusual or bizarre, in accordance with a prior study (Kessler et al., 2005). Another idea would be to rephrase the delusional mood and persecutory ideation items entirely, or add examples parenthetically, though this requires more psychometric and instrumentation work. Second, and perhaps most importantly, the measure could include a single item on whether PE caused any distress, which is more strongly associated with mental health outcomes. Adding this single item could improve the measure’s sensitivity, increasing the odds of capturing individuals who have clinically significant psychopathology.

5 CONCLUSION

Screening for PE is becoming increasingly important in public health and preventive medicine. Using an abbreviated version of the WHO CIDI psychosis screen may be expeditious. However, eliciting the distress associated with PE may enhance its clinical utility.

CONFLICT OF INTEREST STATEMENT

The author declares no conflicts of interest.

DATA AVAILABILITY STATEMENT

Data are available at https://healthmindsnetwork.org/hms/.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.
