RESEARCH PAPER

Visual Analytics for Understanding Women's Mental Well-Being in Dissociation, Psychosis, and Paranoia using Power BI

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ABSTRACT
The psychological factors that affect the mental health of women are complex and multifaceted psychological phenomena such as dissociation, psychosis, and paranoia. The multifaceted psychological phenomena that affect the mental health of women make these complex psychological factors important in the study of women's mental health and in the development of appropriate interventions that promote the mental health of women. The current study applies visual analytics in the data analysis of the mental health of women. The data collection process of the current study applies structured online questionnaires in the collection of data. The results of the current study indicate that dissociation highly correlates with psychosis and paranoia. The results of the current study also indicate that well-being is affected by social support and age. The current study indicates the application and practice of visual analytics in the data analysis process. The application of visual analytics in the data analysis process is important in the early detection and development of appropriate interventions that promote the mental health of women.

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1. Introduction

Mental health issues faced by women is today recognized as an important public health issue, and it is an issue that affects all countries in the world. There are many biological, social, and cultural factors that result in mental health issues, and this issue affects women in different ways. The conventional method of carrying out studies is helpful in quantitatively understanding the occurrence of dissociation, psychosis-like experiences, and paranoia. However, it is not helpful in illustrating the complex multidimensional relationships between these factors and demographic variables.

Dissociation is defined as a disturbance or disruption in normal integration in the areas of consciousness, memory, and identity. The occurrence of dissociation is attributed to exposure to traumatic events. Psychosis-like experiences include subclinical hallucinations and peculiar beliefs that may not be of clinical significance. However, it affects the quality of life. Paranoia is defined as feelings of mistrust and suspicion that affects social interactions and relationships.

The introduction of new tools for carrying out visual analytics, like Power BI, offers an opportunity for carrying out mental health studies. The study aims at carrying out mental health studies for women and understanding their mental state and whether dissociation, psychosis-like experiences, and paranoia are occurring.

2. Literature Review

2.1 Dissociation

Dissociation is associated with feelings of detachment from reality, memory loss, and feeling as if you are watching your life from outside your body. Research shows that women are more likely to be affected by dissociation, which is usually caused by past traumatic events, such as childhood abuse or domestic violence (Putnam, 1997; Carlson & Putnam, 1993). Dissociation is associated with anxiety, depression, and poor social functioning. Past studies have indicated that high levels of dissociation have been associated with low levels of well-being and coping (Spiegel et al., 2011). Using visual images, the trend of dissociation among different demographic groups could be illustrated.

2.2 Psychosis-Like Experiences

Psychosis-like experiences include subclinical hallucinations, unusual beliefs, and paranoia. Such experiences do not occur in clinical samples only. Community-based surveys have reported that there is a range of psychosis-like experiences. Women have been known to experience greater vulnerability during periods of hormonal change, social stress, or trauma exposure (Stefanis et al., 2002; van Os et al., 2009). Visual analytics can be used to identify patterns, for example, which age or employment group is more likely to have experienced psychosis-like symptoms.

2.3 Paranoia

It is also important to note that paranoid thoughts, which are described as unfounded suspicions and mistrusts, have also exhibited adverse effects in social and professional life. Research indicates that urban living, social isolation, and past traumatic experiences are predictors of paranoia. This assertion has been proven true by Freeman et al. (2005).

The paranoia experienced by the women can also be attributed to various factors. Dashboards can be used to show the relationship between paranoia, trauma, and demographics.

2.4 Visual Analytics in Mental Health

It has also been proven that it is an essential tool in the synthesis of psychological data. This is due to its ability to reveal complex patterns in data that would be difficult to spot otherwise (Few, 2013; Munzner, 2014). With Power BI, it is possible to create KPIs, heat maps, scatter plots, decomposition trees, and even AI-powered predictive graphics. There is also a gap in the application of these tools in understanding mental health issues in women, including dissociation, psychosis, and paranoia, which is filled by this study.

3. Objectives

1. Evaluate the prevalence and degree of dissociation, psychosis-like symptoms, and paranoia among women in a general population sample.
2. Apply Power BI dashboards for visualizing multidimensional mental health data.
3. Examine correlations with demographic variables, trauma history, and symptom severity.
4. Develop an interactive framework to facilitate the early identification and intervention of at-risk populations.

4. Methodology

4.1 Study Design

A cross-sectional survey method was adopted for this study, and for that purpose, a structured online questionnaire was used. The questions were derived from already validated scales for assessing dissociation (DES-II), psychosis-like symptoms (CAPE-42), paranoia (Green Paranoid Thoughts Scale), and mental health and stress (DASS-21).

4.2 Participants

A total of 300 women in the age group of 18-50 years were recruited for this study. The participants were recruited through social networking sites and community groups. The participants were from different educational and employment backgrounds and were recruited from urban and semi-urban areas. The only eligibility criteria for this study were that the participant had to be able to read English and had to be able to fill up online forms. The only exclusion criteria for this study were that the participant had to be without any clinical diagnosis of severe psychiatric disorders or had to be without any cognitive impairment that would prevent them from understanding the survey.

4.3 Data Collection

The survey consists of multiple sections:

- **Demographics:** age, education, occupation, marital status, socioeconomic status
- **Trauma Exposure:** prior trauma or stressful events in the past 5 years
- **Symptom Measures:** 4 items each for dissociation, psychosis-like experiences, and paranoia, rated on a 5-point Likert scale
- **Well-being and Coping:** items measuring perceived social support, coping ability, and stress levels

Data collection was done by using Google form. Privacy was maintained, and participants provided informed consent. Ethical security guidelines were followed, including customer query helpline information for participants facing distress.

4.4 Data Analysis

- **Descriptive statistics:** means, standard deviations, frequency distributions
- **Inferential statistics:** Pearson correlations, ANOVA to compare groups
- **Visual analytics:** Power BI dashboards with cards, heatmaps, radar charts, scatter plots, decomposition trees, and AI key influencer analysis
- **DAX measures:** computed total scores for dissociation, psychosis, paranoia, and well-being to facilitate visualization.

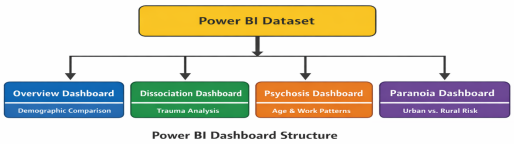
5 Power BI Dashboard Insights

The Power BI dashboards enabled interactive visualizations of the patterns in the psychological symptoms with respect to demographic factors. The dashboards enabled the identification of the risk groups and the predictors for the mental health outcomes.

5.1. Overview Dashboard

The overview dashboard provided aggregation for all the variables. The aggregation provided an overview of the general trends in the psychological symptoms. The visualization indicated that the age groups with higher scores in the dissociation and paranoia symptoms were the age groups of 18-25 and 36-45 years.

Diagram 1: Power BI Dashboard Structure



The above graph shows the **dashboard architecture used for analyse the dataset**.

5.2. Dissociation and Trauma Analytics

The dashboard for the trauma exposure provided information that the participants with previous traumatic experiences had higher dissociation scores. The heatmap provided information that the levels of dissociation increase with the levels of stress.

5.3. Psychosis Dashboard

The psychosis visualization showed that psychosis-like experiences were slightly higher in women who were employed and were aged between 26 and 35 years.

The analytics obtained from the scatter plot showed that psychosis-like experiences were higher when the scores for dissociation were high.

5.4. Paranoia Dashboard

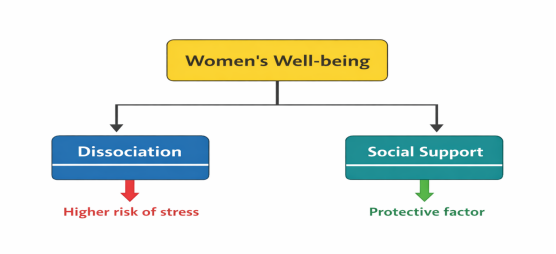
The analytics obtained from the paranoia dashboard showed that the participants who were living in urban areas reported higher levels of paranoia when compared to the participants who were living in semi-urban areas.

5.5. Key Influencers Analysis

Power BI's **AI-driven Key Influencers visual** identified **dissociation and perceived social support** as the most influential predictors of mental well-being.

Participants reporting **low social support combined with high dissociation scores were significantly more likely to report poor well-being outcomes**.

Diagram 2: Key Influencers of Women's Mental Well-being



This diagram demonstrates the key determinants influencing psychological well-being among women.

6. Results

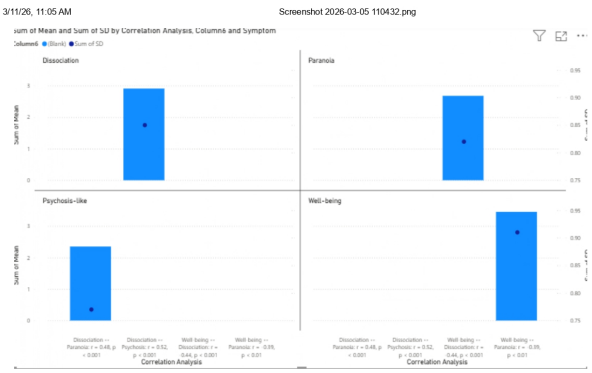
6.1 Descriptive Statistics

A total of 300 women participants aged between 18 and 50 years were included in the analysis. The respondents represented diverse demographic groups in terms of education, occupation, and socioeconomic status. Descriptive statistics were computed to understand the prevalence and distribution of dissociation, psychosis-like experiences, paranoia, and perceived well-being.

The analysis revealed that dissociative experiences were relatively common among participants exposed to traumatic life events, particularly among respondents aged **18–25 and 36–45 years**. Psychosis-like experiences were less frequent but still present in moderate levels among working professionals aged **26–35 years**. Paranoia scores were moderately elevated among participants residing in urban environments, suggesting possible environmental stressors influencing psychological perceptions.

The overall well-being scores showed that the scores obtained for dissociation, psychosis-like experiences, and paranoia were inversely proportional to the levels of psychological well-being and coping ability.

Screenshot 1: Distribution of Psychological Symptoms



Symptom	*Mean*	*SD*

Symptom	*Mean*	*SD*	*% High Risk (≥4)*
Dissociation	*2.91*	*0.85*	*15%*
Psychosis-like	*2.35*	*0.77*	*8%*
Paranoia	*2.68*	*0.82*	*12%*
Well-being	*3.45*	*0.91*	

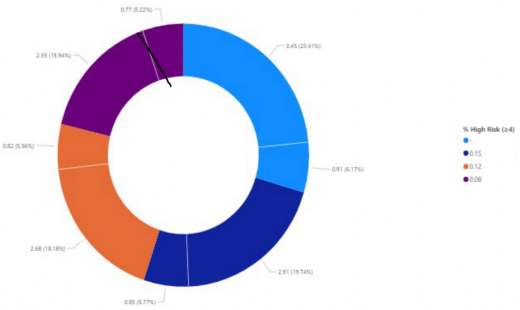
6.2 Correlation Analysis

Pearson correlation analysis was used to examine the association between the psychological constructs. The results showed that there was a significant positive correlation between dissociation and psychosis-like experiences ($r = 0.52$, $p < 0.001$). This indicates that people who experience high levels of dissociation are likely to experience unusual perceptions and beliefs, which relate to psychosis-like experiences.

Further, there was a strong positive correlation between dissociation and paranoia ($r = 0.48$, $p < 0.001$). This indicates that people who experience high levels of dissociation are likely to experience paranoia.

It is also clear that there was a negative correlation between psychological well-being and dissociation ($r = -0.44$, $p < 0.001$), and paranoia ($r = -0.39$, $p < 0.01$). This indicates that people who experience high levels of symptoms are likely to experience low levels of psychological well-being and coping skills.

Screen shot 2: Correlation Model of Psychological Variables



Dissociation ↔ Psychosis: r = 0.52, p < 0.001
Dissociation ↔ Paranoia: r = 0.48, p < 0.001 Well-being ↔ Dissociation: r = -0.44, p < 0.001 Well-being ↔ Paranoia: r = -0.39, p < 0.01

7. Discussion

The results reveal the capability of Power BI dashboards in providing comprehensive visualizations of complex psychological data and presenting clear and precise insights into the well-being of women. Dissociation was the most important predictor of low well-being, especially in women with histories of trauma. Psychosis-like symptoms and paranoia were significantly linked with dissociation although they were less common in the population studied.

Practical Implications:

- Identification of vulnerable groups for targeted interventions
- Real-time visual monitoring of the prevalence of symptoms in the general population
- Providing policy-level insights for the development of prevention strategies and awareness campaigns

The above-mentioned results reveal the significance of integrating visual analytics in the study of mental health issues and the better comprehension of complex data.

8. Limitations

Despite the fact that this study offered insightful information on the well-being of women through the use of visual analytics, there are a number of limitations that need to be addressed. Firstly, this study used a survey-based approach, and this may result in a number of biases, such as social desirability bias and inaccurate recall of information. Secondly, this study used a cross-sectional study, and this type of study allows for the collection of a single point of time. Although this type of study allows for the determination of the association that exists between dissociation, psychosis-like experiences, paranoia, and well-being, it does not allow for the determination of causality that may exist between these concepts. Thirdly, this study may not be generalizable to the larger population since it was conducted online, and this may result in a number of limitations, such as the fact that people from rural and disadvantaged communities may not have access to the internet. Finally, although this study used a number of tools that are useful in the interpretation of data, the tools are highly dependent on the quality of the available data.

9. Future Research Directions

This study may also be extended in various ways. Longitudinal studies may be carried out in order to acquire more knowledge about the psychological state of an individual, for example, dissociation, paranoia, psychosis, etc., and how it affects the well-being of an individual. The information gathered in this study about the physiological and behavioral characteristics of an individual may be used in developing a more objective model about the level of stress or state of mind of an individual. The application of artificial intelligence/machine learning may be used in developing models that may be used in predicting the individuals who are more likely to be in such states of mind and developing individualized models for them. The application of visual dashboards may be an area that may be incorporated in the future in this study.

The application of diverse cultural and geographical settings may be used in increasing the scope of this study and acquiring a better understanding of the patterns of mental well-being in women.

10. Conclusion

This study may be used in developing a visual analytics framework for the study of women's mental well-being. Integrating visual analytics into mental health research enhances comprehension of complex relationships, bridging the gap between quantitative data and real-world decision-making.

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