

# A Study of Antidepressant and Anxiety Interviews Based on HDP Topic Modelling of Sichuan University MD and Deputy Chief Physician of Shandong Provincial Hospital (Literature Review and Research Methods)

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## ABSTRACT:

The current research informs about the cognition of the processes of identification and treatment regarding depression and anxiety, at the same time pointing out the core position of emotional expression in maintaining the psychological state of an individual, in particular in a Chinese cultural environment. Data from interviews taken during the study were analyzed using the HDP theme modelling technique in order to extract some themes very closely related to mental health, such as emotional expression, family system therapy, school environment, and self-regulation. The themes reflect the special meaning of emotional expression in Chinese culture and emphasize the great potential of the family and school to promote mental health conditions and emotional expression. This article points out the risk of overdiagnosis in the diagnosis states, like depression and anxiety, and underlines the particular significance of self-regulation and emotion management for individuals when it is impossible to get any help from outside. These findings suggest that emotional expressiveness is of such critical importance in the maintenance of good mental health, particularly at home and in the school setting. Based on their clinical experience, school, and mental health education, the authors encourage society to give more attention to family therapy. The article finally concludes with the statement that emotional expression is of paramount importance in speaking to the status of a person's mental health and

deserves further promotion and encouragement within the family, school, and greater social realms.

**KEYWORDS:** Emotional expression, Family systems therapy, School mental health education

## I. INTRODUCTION

In Major mental health challenges faced in contemporary society, including depression and anxiety disorders, affect tens of millions of people in daily life and productivity at work. Many cultures have traditional attitudes and social pressures that inhibit the free expression of personal feelings, which actually should be an important part of maintaining good mental health. We sincerely hope that every single one of them will find treatment and also be able to find the support network most suited for their need. For this conversation, a medical doctor from Sichuan University, and a deputy chief physician of a provincial hospital shares insights and his personal experience with depression and anxiety. Through intensive discussions on issues such as expression of emotions, family systemic therapy, school environment, self-regulation, lack of motherhood, cyclical mood swings, facing inner shadows, psychiatric treatment, and personal growth, we aim to bring multi-angle views for the readers, which might be helpful in further understanding and discussion of mental health topics. This paper will review treatments and support systems for depression and anxiety disorders while exploring the association between emotional expression and

mental health to give the reader a holistic perspective in understanding and discussing mental health issues.

### **Purpose of the Study**

It mainly employed the topic modelling techniques of Hierarchical Dirichlet Process, applied to in-depth interviews of participants with depression and anxiety disorders. The core focus of this research is to analyze impacts caused by emotional expression, family systemic therapy, school environment, and self-regulation on the mental health status of individuals, especially within the Chinese cultural context. The present study investigates the relationship between emotional expression and mental health, as well as copes with the significant contributions of family and school in emotional expression, maintaining, and promoting mental health. All this can only be done for laying a sound theoretical basis for mental health interventions or treatment programs.

### **Significance of the Study**

The implication of this shall be far-reaching at both the theoretical and practical levels. First, applying the HDP topic modelling technique allowed us to identify and analyze major topics that were most closely related to depression and anxiety disorders for deeper insights into how emotional expression influences family systemic therapy, school environment, and self-regulation in relation to influencing their mental health in particular in a Chinese cultural perspective.

Secondly, while this study shows the possibility of overdiagnosis, the importance of self-regulation of emotions is underlined in the course of diagnosis and treatment of depressions and anxiety disorders-new inspirations are given to the existing approaches to treatments.

Moreover, it confirmed the scientific basis of the mission pursued by families and schools concerning individual mental health and social awareness, promoting the importance of family systemic therapy and school mental health education. Finally, it also theoretically sets a basis for the design and implementation of mental health intervention strategies at the level of the individual, standing in guarantee of broad applicability within various fields.

### **Research Questions**

1. How can we identify key topics related to depression and anxiety disorders through Hierarchical Dirichlet Process, or HDP, topic modelling techniques that can offer us deep insights into the drivers of mental health?

2. What is the impact of emotional expression on a person's mental health, and how can such an impact be precisely located within the Chinese cultural context?

3. In the Chinese cultural context, discuss how family systems therapy contributes to an improved mental health status in individuals with states of depression and anxiety disorders.

## **II. LITERATURE REVIEW**

[1]Depression and anxiety have been among the leading mental health concerns worldwide and also have been major concerns in the Chinese cultural contexts of importance and concern. [2]As a result of the impact of social emotional expression, many patients cannot get the emotional support they need. This study, using the self-report instrument, researched the following hypothesis: that emotional expression might actually relate to mental health, and suppressions could result in increases in symptoms of depression and anxiety. [3]The family in China is an important source of emotional support, but the traditional culture of the family is often lacking in awareness and attention needed with regard to psychological problems. Thus, it makes too difficult for the patient to get effective help.

### **2.1 Family Systems Therapy: Promotion of Healthy Minds**

Family systems therapy is a psychotherapeutic approach that strengthens communication among family members to help patients in reassuring their psychological personal health. As the central position in life, family system questions are of particular suitability for psychological influence in the Chinese cultural context. According to various studies, research has sported that family systems therapy can cut down certain symptoms like depression and anxiety, as well as improve emotional support within the family. [4]For the Chinese, whose culture best embodies family harmony and collectiveness, family systems therapy promotes psychological well-being by improving family relationships. For example, the study by Sim and Hu (2009) indicated that the treatment of family systems therapy was effective for reducing the symptoms of depression and anxiety and improved family functioning and emotional support among Chinese patients. As such, family systems therapy is a helpful treatment in allowing the Chinese to achieve mental health adjustment, particularly in this contemporary society through their relationships and culture.

## 2.2 Influence of school environment on mental health status in adolescents

[5].[6]The school environment is also one of the critical factors that affect the adolescents' mental health. Academic stressors, peer interaction, and support from teachers in the school environment have been proved by scholarly research to exert a direct influence on adolescents' emotional regulation as well as mental health status. In China, the competitive nature of the education system places immense pressure on adolescents. [7]This has subsequently led to the gradual inclusion of emotion management programs in schools and also counselling sessions to help the students manage their emotions and thus avoid depression and anxiety.[8]It is also evident that within the school setting, social and emotional learning bears a positive impact on the mental health perspectives of the students, and this has been indicated by the study of Durlak.

## 2.3 The importance of self-regulation and managing emotions

It also helps them in self-management of depression and anxiety. Effective self-regulation, on the other hand, enables an individual to cope more effectively with emotional distress to become less vulnerable to external stressors. [9]. [10]. [11]. [12]. Resilience prevents further deterioration of depression and anxiety in cases of a lack of support from the outside world, using psychological mechanisms like self-regulation and emotion management, as stated in their study by Li, 2005; Chen, 2000; Russell & Yik, 1996; Tsai, 2007. [13]In Chinese culture, restrained self and emotional repression may be traditional attributes that affect persons' abilities to self-regulate; hence, research is needed to test how enhancing emotion management abilities can be conducted with cultural norms.

## 2.4 Application of HDP topic modelling technique in mental health research

The HDP was widely used as a topic modelling technique in the research area of natural language processing and text analysis. Unlike classic methods, automatically deciding beforehand the number of topics is an advantage; hence, HDP was able to deal with the complex mental health data. HDP technology was utilized in the field of mental health research to extract the key themes related to emotional expression, family system therapy, school environment, etc., which were helpful for the researchers to know and understand in detail about the influence of the aforementioned constructs on depression and anxiety.

[14].[15]Thus, with the aid of topic modelling in HDP, researchers have successfully mined implicit affective patterns and themes of mental health from large ad hoc interview data in order to carry out psychological intervention strategies with more precision.

Depression and anxiety are modern mental health issues around the globe, and in the Chinese cultural context, due to restrictions in emotional expression and norms, it is hard for the patients to receive effective support. Family systemic therapy and school environment are two main sources of social support for the development of individual mental health. In this sense, it is very crucial to handle depression and anxiety by means of self-regulation and emotion management. The HDP topic modelling technique opens a new perspective in mental health research that helps researchers extract key themes out of complicated data. Future studies should go on investigating the pattern in emotional expression in Chinese culture, as well as implicitly addressing the way technology can be employed to enhance the effectiveness of psychological treatments.

## III. RESEARCH METHODOLOGY AND DESIGN

Chapter Summary: In this research section, we applied HDP for thematic modelling so that the interview text data related to depression and anxiety symptoms could be deeply analyzed. Based on the interviewees from the Chinese cultural circle, the research examined the patient population carefully, particularly variables that would affect an individual's mental health status, such as patterns of emotional expression, family treatment patterns, campus climate, or one's self-regulating ability. We further constructed the model repeatedly with the adjustment of parameters in order to drive the best number of themes that could make our model robust and explanatory. The performance metrics of Perplexity and Topic Coherence evaluated the model, with a comprehensive analysis of identified themes using the Random Forest algorithm in pursuit of improving the prediction accuracy on the model. Through data visualization and in-depth analysis, we will be able to discover the themes very close to depression and anxiety, and their intrinsic connections with each other, which show the most critical factors that influence mental health.

### 1. Study population

The target patients suffering from depression and anxiety, especially those in the Chinese cultural environment, will be targeted in

this study. The research will collect data through in-depth interviews related to the psychological status and emotional expression of the patients, and the influence of social environmental factors such as family and school on their mental health.

## 2. Research methodology

Hierarchical Dirichlet Process was utilized for thematic modelling in this study to analyze the interview data. By iteratively modelling and adjusting the number of themes, the core topics that are highly related to mental health were extracted, such as emotional expression, family system therapy, school environment, and self-regulation.

The evaluations concerning two important aspects, such as perplexity and topic consistency, were helpful to ascertain the reliability and ease of understanding of the topics extracted. In this study, the Random Forest algorithm was used, integrating topic modelling data in order to improve model efficacy and the accuracy of predictions.

**3. The procedure** of the research preprocessing on interview text data was performed to convert the data into an appropriate format for topic modelling. Further, HDP topic modelling has been implemented, choosing an appropriate number of topics using different features like per-word perplexity and topic coherence. The model parameter optimization was decided by running the model for several iterations. The identified topics are then validated by constructing a feature matrix and training it through a random forest model. Lastly, deep analysis of the results from the model was done to understand how each of the theme contributions would be made towards developing depression and anxiety.

### 3.1 HDP topic modelling research procedures

#### Procedure 1: Data Preprocessing

Cleaning and collecting of the dataset, in this case, the textual data itself was organized and confirmed by interviewees.

Remove the stop words and special characters.

Text Preprocessing - Conversion of Text Data to Numerical Representation

#### Procedure 2: Determining the number of themes

Applications possible in usability testing of topic modelling through metrics like perplexity and topic coherence.

Do multiple topic modelling with the different number of topics in order to decide a reasonable number of the topics.

Continue to generate the number of selected topics by using the results of the number of topics

#### Procedure 3: HDP topic modelling

Use HDP algorithm to model above interview documents 10 times with 22 topics each time.

#### Procedure 4: Assess topic modelling

Analyze topic models using various metrics such as perplexity, topic consistency, etc.

Use multi-theme modelling a few times in order to check the stability and interpretability of the theme model.

Choose the best topic model based on the results of topic modelling.

#### Program 5: Understanding Theme

After conducting topic modelling, explain the meaning of the topics and their relations using the results.

Use the results of the topic modelling to create the topic descriptions.

#### Procedure 6: Emphasize Visualisation of Results

Use the results of Topic Modelling to develop a visual chart of the topic.

These steps were combined in the study, i.e., in a combination based on the situation of the research topic. The steps are not listed in very clear sub-steps:.

### 3.2 Mermaid - HDP Thematic Modelling Study

#### Program Map Code

The Mermaid code is as follows, write the code to Mermaid to generate the Mermaid -HDP topic modelling study program graph

graph TD

A[Data preprocessing] --> B[Determine number of themes]

B --> C [HDP Theme Modelling]

C --> D [Theme Model Evaluation]

D --> E [Theme Interpretation]

E --> F [visualization of results]

subgraph A [data preprocessing]

A1 [Collection and cleaning of data]

A2 [Removal of stop words and special characters]

A3 [digital representation of textual data]

A1 --> A2 --> A3

end

subgraph B [Determine number of topics]

B1 [Evaluate model using confusion and topic consistency metrics]

B2 [perform multiple topic modelling to determine a reasonable number of topics]

B3 [select optimal number of themes]

B1 --> B2 --> B3

end

subgraph C[HDP topic modelling]

C1 [10 modelling sessions using HDP algorithm]

C2 [22 topics generated at a time]

C1 --> C2

end

subgraph D[Topic modelling evaluation]



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D1 [Evaluate model using confusion and topic
consistency metrics]
D2 [Perform multiple topic modelling to assess
model stability and interpretability]
D3 [select the best topic model]
D1 --> D2 --> D3
end
subgraph E[Explanation of themes]
E1 [Explain the meaning and relationships of the
themes]
E2 [generate topic descriptions and keywords]
E1 --> E2
end
subgraph F[visualization of results]
F1[Generate a visual graph of the topics]
End

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