SUBMITTED 13 AUG 22
REVISION REQ. 21 SEP 22; REVISION RECD. 24 OCT 22
ACCEPTED 9 NOV 22
**ONLINE-FIRST: DECEMBER 2022**
**DOI: https://doi.org/10.18295/squmj.12.2022.067**

# Examination of Behavioural Patterns of Psychological Distress and Evaluation of Related Factors

## *A latent class regression*

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**Abstract**

***Objectives*:** Psychological Distress (PD) is a unique and suffering emotional state in response to a stressor or specific need that leads to temporary or permanent impacts. Due to its negative effects on several features of life like the quality of life, health, performance, and productivity of individuals, PD and its consequences are considered as a public health priority. In this study, we aim to identify the behavioral pattern of PD in the population of 18 to 65 years old in Mashhad using latent class regression and evaluate the related factors. ***Methods*:** A cross-sectional study was performed on 425286 individuals aged 18 to 65, who were referred to health centers in Mashhad, northeastern Iran in the first half of 2018. The information required for this study including a checklist of demographic information and the Six Item Kessler Psychological Distress Scale (k-6) was obtained from the Sina system. ***Results*:** Latent class regression identified three latent patterns of PD in answering the questions of the K-6 questionnaire, including severe PD (14%), low PD distress (40%), and no PD (46%). Statistical variables of this study due to the results are considered as the following; women, illiterate people, unemployed

and divorced people, individuals aged between 50-59 years old, and people with low weight were more likely to be in severe PD class than no PD class. ***Conclusion*****:** Although a small percentage of people were classified as severely disturbed, the findings showed a high rate of symptoms of distress and sadness even in the no PD class.
***Keywords*****:** Cross-Sectional Studies, Psychological Distress, Latent Class Analysis, Iran

**Advances in Knowledge**

- Psychological Distress (PD) is a unique and suffering emotional state in response to a stressor or specific need that leads to temporary or permanent impacts. PD adverse effects on health, performance, and productivity are proposed as a public health priority.

**Application to Patient Care**

- There is a high rate of symptoms of significant distress and sadness even in the no PD class.
- There is a need to develop appropriate strategies for prevention and treatment and provide the necessary training and intervention for high-risk groups of PD, especially women.
- Using the achieved results through careful planning, diagnosis, treatment, and prevention of mental disease can lead to building a healthy and vibrant society away from mental and psychosomatic illnesses.

## Introduction

Tensions, stresses and life's problems are common phenomena of modern life, but ineffective management of these challenges can lead to stress disorders, Psychological Distress (PD), and physical ailments. According to numerous epidemiological studies in recent years, the prevalence of mental disorders in different countries is increasing daily; The prevalence of these disorders in different countries varies from 13 to 22 %.[1] These disorders are one of the five leading causes of disability and are known as an strong predictor of death from heart disease, stroke, and cancer.[1] It is estimated that 12% of the total burden of disease globally is due to mental disorders and is expected to increase to 15% by 2020.[2] The prevalence of these disorders in Iran is estimated between 11.9% to 23.8%.[3, 4]

PD as considered by Mirowsky. J. is a state of emotional suffering consisting of symptoms related to depression and anxiety,[5] which lead to decline in quality of life at the individual level and because of their adverse effects on health, performance, and productivity, are proposed as a public health priority.[1] It is noticeable to mention some symptoms of PD that include a wide range of physical to mental states. Sleep disturbance, anorexia, chronic pain, fatigue, loss of menstruation for women and headaches are some of Physical symptoms while some symptoms like feeling of sadness, Nervous, Helplessness, Hopelessness and Worthlessness are known as mental ones. The prevalence of mild mental disorders (depression, anxiety) in different countries in general populations varies between 7.3 to 52.5%.[6] According to DSM-5-TR high levels of PD is considered as one of negative functional consequences of Specific learning disorder.[7]

According to the results of the Global Burden of Disease Study (GBD) in 2016, depressive and anxiety disorders from 2005 to 2016 were among the top ten causes of loss of Iranians life due to disability.[8] The study estimated the number of people with mental illnesses and drug-related disorders in 2016 at 1.1 billion worldwide.[8] The term PD is a type of mental symptoms that is used as an indicator of mental health issues in demographic and epidemiological studies.[9]

PD and its measurements strongly refer to the symptoms of depression and anxiety and mainly refer to cognitive behaviors disorders, Depressive Disorders and Anxiety Disorders so reports indicate that PD affected most of these disorders.[10] As mentioned, PD is commonly referred to as emotional suffering characterized by symptoms of depression (such as apathy, sadness, hopelessness) and anxiety (such as restlessness, feeling tense).[9] In other words, PD is used to describe a short but acute period of a specific mental symptoms that first presents with features of depression or anxiety and can be deemed as a type of abnormality that is responsible for maladaptive cognitive behavior and thought, which requires specialized intervention.[11] PD encompasses a much wider range of experiences than mental illness, ranging from mild symptoms to severe psychiatric disease.[12] In these cases, it is noticeable that life enthusiasm notably decreases, and also feeling of heartbreak and despair become dominant throughout an individual's life.[11] So severe PD is a predictor of serious mental illnesses like depression and anxiety and other disorders.[2]

Based on the findings of previous studies, the prevalence of PD in India was estimated at 20.2%, in Japan at 6.7%, in the United States at 3.4%, in Canada at 12%, and in Australia at 11.1%.[2, 13-15]

The prevalence of PD in Iran is reported to be very diverse, from 10.1% to 57.2%, depending on the questionnaire used, the cut-off point considered, the demographic characteristics and the time of the study.[16-20]

Studies in different parts of Iran also show that the prevalence of PD is not only less than the recorded statistics of other countries but also not less than the reports of the World Health Organization and the reported by Noorbala study in Mashhad and Shafiei in Isfahan.[21, 22]

Three categories of factors include Socio-demographic characteristics (e.g., gender, age, and ethnicity), Factors related to stress (e.g., living conditions and life events), and Personal resources (e.g., income, education, social network, and social support) are recognized as influential factors in PD in the general population.[2, 9, 23-25]

Recent studies conducted in different parts of the world showed a high prevalence of PD due to increasing rate of mental disorders like anxiety and depression ones. Such a trend has created the need for appropriate health care and services to provide mental health services in health centers, especially for high-risk groups of mental disorders. For this purpose, epidemiological studies of PD play an important role in determining the general mental health status of the community, identifying related demographic factors, and estimating the resources needed to provide better health services in the country. Health care centers can also play a critical role in different processes such as diagnosis, care, and treatment of individuals grouped in high-risk mental disorders. There are several fields of study such as the patterns of PD and the evaluation of related factors simultaneously in a large-scale study, which has been less studied especially in Iran. Therefore, this study intends to examine the pattern of PD of patients aged 18 to 65 years in Mashhad health centers based on the K-6 questionnaire. The research identifies related factors,

provides appropriate suggestions and programs in order to provide better mental health services for people prone to psychological disorders, and also helps the relevant authorities.

## Methods

The present study is cross-sectional and descriptive-analytical research was performed in Mashhad. Mashhad is the second-most-populous city in Iran and the capital of Razavi Khorasan Province, which is located in the northeast of the country. The information used in this study was extracted from the Sina Electronic Health Record System (SinaEHR) database under the supervision of Mashhad University of Medical Sciences. Sina system has been used since 2016 to electronically record the health records of patients who were referred to health centers in Khorasan Razavi province and so far covers about 40% of the population of Mashhad. This system includes demographic information, health records of each individual, reports of physicians and health care providers, laboratory results, screening forms and age group care, and other details of clients' files. One of the screening forms used in this system is the K-6 questionnaire. In this study, information was received on people aged 18-65 who were referred to Mashhad health centers for the first time in the first half of 2018 and completed the K-6 questionnaire. The inclusion criterion in this study was the answer to at least 50% of questions of the questionnaire (3 questions), and people who had a diagnosis of neurological problems in the past were excluded from the study. Data after correction and purification included 425286 people.

Voluntary referral, the confidentiality of identity information, non-disclosure of individuals' names, lack of prejudice, and involvement of inclinations in the research results, and mentioning of all scientific sources have been among the ethical considerations considered in this research. This study has been approved by the National Committee of Ethics in Biomedical Research with the ethics ID: IR.MUMS.REC.1398.058.

This survey comprised two instruments to gather data: standard demographic questions including gender, age, marital status, level of education, job type, place of residence, body mass index, and six-item Kessler psychological distress scale (K-6) to measure the participants' PD. The K6 scale is a population-based screening measure for identifying PD and is widely used in general

populations.[23, 26-28] This scale is a truncated version of 6 items from the K10 scale that was introduced in 2002 by Kessler et al. [8] Responses were scored on a five-point Likert scale reflecting how much over the past month time respondents had experienced 6 symptoms, including sadness, restless, nervous, helpless, hopeless, and worthless. The measure has five response categories ranging from 0 (none of the time) to 4 (all of the time). The items were summed to generate a total score ranging from 0 to 24, with higher scores indicating higher levels of PD.[10] The validity and reliability of its Persian version have also been confirmed in previous studies.[10, 18, 29]

Latent Class Regression (LCR), a model-based clustering approach, was used to classify each participant into a latent class whose members report similar patterns of responses K-6 questionnaire. Determining the cut-off point for the PD questionnaire is challenging, and several cut-off points have been proposed so far. [9, 15, 23] In LCR, there is no need for a cut-off point that is a function of demographic characteristics of communities.

LCR can also assess the effect of covariates on the classification.[30, 31] Huang suggested a generalization of LCR can evaluate the effect of covariates on latent variables as well as the observed variables.[32] Interpretation of coefficients in LCR is similar to logistic regression based on odds ratio. Determining the optimal number of latent classes in LCR is challenging.[33, 34] Statistical criteria (such as Akaike Information Criterion, Bayesian Information Criterion, likelihood-based tests, log-likelihood difference test, Lo-Mendell-Rubin test, bootstrap likelihood ratio test, and entropy) and interpretability are commonly used to determine the number of classes.[33]

Models with lower evaluation criteria (AIC, BIC, AIC3, and CAIC) are preferred to those with higher values for these criteria. Other fit statistics such as likelihood tests (i.e., tests log-likelihood difference test, Lo-Mendell-Rubin test, and the bootstrapped likelihood ratio test) provide a p-value, which indicates if one model is statistically better than another.[34] Another set of methods for evaluating LC cluster models is based on the uncertainty of classification or, equivalently, the separation of the clusters. Entropy as a diagnostic statistic, indicates how

accurately the model defines classes. In general, an entropy value close to 1 is ideal and above .8 is acceptable.[35]

In this study, K-6 questions are considered as indicator variables, the PD is known as a latent variable, and gender, age, marital status, education level, job type, residence, body mass index are covariates in LCR. All analyses were performed using LatentGold 5. If the p-value was less than 0.05 (typically $\leq 0.05$), the result was considered significant.

**Results**

Out of 425286 participants, 72.7% were women, 90.6% were married, 72.5% had a diploma and undergraduate education, and 54.2% were suburban residents. The mean age and body mass index (BMI) of the participants were 36.02±9.58 years and 26.5±4.88, respectively. Demographic characteristics of the study population are presented in Table 1.

The mean score of the K-6 questionnaire is 4.23±4.54. Most people (over 75%) have experienced little or no symptoms of anxiety. However, half of the people have always, sometimes or most of the time been upset and sad. Only 3% of people always or most often suffered from feelings of emptiness and worthlessness. This rate was less than 5% for symptoms of hopelessness and helplessness. It is worth mentioning that the rate of answering the questions of the questionnaire is 98.5%.

To determine the optimal number of latent classes, goodness-of-fit criteria for the LCR model with 2-6 latent classes fitted to the data, and the results are shown in Table 2. As the number of classes increased, the goodness-of-fit indices decreased, but for models with more than three classes, no significant improvement in index values was observed. The value of entropy and R2 in the latent class model with three classes are 0.78 and 0.79, respectively, which is a statistically significant value for a model and can well explain the latent pattern of the data. This model also can interpret in practice. Considering more than three classes makes it difficult to interpret the data correctly. As a result, the latent class model with three classes is the optimal model for the studying data.

The proportions of individuals in the classes that have been created based on the K-6 question pattern are presented in Table 3.

It can be seen that no PD class, which has the highest volume among the classes, people did not report any PD symptoms during one month. In other words, more than 90% of these people have never experienced symptoms of PD. In the low PD class, at least 80% of people have never or minor experienced symptoms of nervous, helplessness, hopelessness, or worthlessness. Nevertheless, this rate was higher for the symptoms of sadness and restlessness; over a month, more than 60% of people reported these symptoms slightly or occasionally. This class accounts for 39% of the samples. It was estimated that 14% of people are suffered from severe PD. Most people in this class sometimes suffer from symptoms of  PD. But, most of the time, they felt sadness and restlessness.

The LCR model, in addition to determining the latent classes, also makes it possible to evaluate the effect of independent variables on the placement of individuals in the formed latent classes. In this study, the no PD class is considered as a reference category. The numerical value of the coefficients (in terms of odds ratio) expresses the effect of increasing one unit in the independent variable on the placement of individuals in classes of severe and low PD compared to no PD.

Table 4 shows the effect of independent variables on the membership of individuals in PD classes compared to the reference class in the form of regression coefficients.

The findings of Huang's LCR model showed that most of the auxiliary variables have a significant relationship with patterns of PD.

So that women, divorced, illiterate, unemployed, aged 50-59 years and underweight people have a higher chance among other people to be in the class of severe PD.

In the LCR model, it is possible to evaluate the effect of independent variables that is influential on the answers to each question of the questionnaire. In general, all independent variables had a significant effect on answering the questions of the questionnaire.

## Discussion

As PD is known as predicator of some mental issues and disorders, Epidemiological studies of PD can play a constructive role in determining the general mental health status of society, identifying demographic factors related to it in the country. Having a significant sample size available and using the LCR model, in this study, we were able to identify latent patterns of PD among patients referred to Mashhad health centers and evaluate the factors related to these patterns.

Using LCR, by entering the effect of auxiliary variables, the classification results were improved, and three latent classes or different patterns in answering the questions of the K-6 questionnaire were discovered. The first class consisted of 46% (no PD), the second class 40% (low PD), and the third class 14% (severe PD). People in the severe PD class consistently reported most of the symptoms, and in contrast, people in the no PD class never experienced these symptoms. A similar study by Barragan et al. had similar results and among the four latent identified classes, 2.8% were classified as severely disturbed and 13.6% as moderately disturbed.[36] The structure of the formed classes showed that the level of sadness and grief among people, even in the no PD class, is higher than other symptoms, which is a matter for consideration and needs further investigation to find the cause.

On the other hand, the feeling of emptiness and worthlessness in all classes, even among people with severe PD, was the lowest compared to other symptoms. Less of these symptoms may be rooted in the culture and beliefs of the people, religious beliefs and values, relationships, and solidarity between families, which despite the high mental pressures among individuals as a protective factor, prevents people from the occurrence of such feelings.

Women are more prone to PD than men. The Barragan study in the United States found similar results.[36] Compared to women, men were less likely to be in the moderate anxiety class, mild distress, and restlessness than in the non-anxiety class. 26 Factors influencing these results are biological factors, environmental factors, gender roles, less social participation of women, and

their greater vulnerability in different life situations. In similar studies, mental distress had a significant relationship with gender and it was more among women than men. [2, 23-25, 37]

In addition, in Parsaei 's study regarding the quality of life among employees, men were classified better in the quality of life class and had less depression and anxiety than women.[24]

Unlike Barragan's study, in which the age variable was not significant,[36] the results of the present study indicate that by increasing age up to 59 years, the chances of being in the class of severe PD increase compared to no PD. However, this rate is lower for the low anxiety class in the age group of 60-65 years compared to the 50-59 age group. The lower prevalence in the elderly than in the 50-59 age group is probably due to many factors like support and respect of family members, reducing their role in education and family finances, in other words, reducing the burden of responsibility. On the other hand, increasing the prevalence due to age can lead to improving the burden of responsibility and raising children, biological changes related to adulthood, and social responsibility. In another similar study, PD had a significant relationship with age.[2] Also, a study in Japan showed that until 2016, the highest questionnaire score was among women aged 25-29 and then 30-34 years old.[23]

According to DSM-5-TR, Psychological distress due to the different levels of life's traumatic events and their contexts  have diverse symptoms and forms.[4] Women who are single, widow, and divorced compare to married people are more likely to be in the two low PD and serve PD classes which divorced people have the highest chance of belonging to them. The results of Barragan's study also showed that married people are less likely to be in high, moderate, and mild distress, restlessness, and restlessness classes.[36] Murugan's study also showed a significant relationship between PD and marital statu.[2] However, because in the present study, most of the widows and divorced people are women, the reason for the above results can be a bitter experience in their life, enduring the pressure and responsibility of living alone, economic pressures, child care, and family management. On the other hand, for single individuals, some concerns may increase the likelihood of PD such as their concerns about marriage and choosing a spouse, and also their concerns about the confusion of future life.

Findings showed that with increasing levels of education, the probability of severe and low PD decreased. Similar studies was also consistent with our results. [2, 36] Probably the reason for the high chance of illiterate people being in the class of severe and low PD can be attributed to the inability and ignorance of these people to use appropriate methods of coping with stress, social and cultural constraints. Also, it is noticeable that the reason for the decrease this value in educated people is their greater ability to access information, to communicate and understand more correctly the existing situations, to observe the principles of mental health and timely prevention and necessary treatment, and finally to use appropriate methods to deal with stress. Less chance of being in PD classes among people with a seminary education may indicate that spirituality is involved in controlling emotions, and this can play a beneficial role in preventing and treating mental illness and developing treatment plans for authorities.

Employees were less likely than unemployed people to report severe PD. This rate was lower among government employees than the unemployed compared to the self-employed. In the Barragan study, employees had a lower chance of getting into high and moderate PD than the unemployed.[36] Lack of income, fewer social relationships, the monotony of daily life, and lack of influential position in society are probably the reasons for the high chance of suffering from PD among unemployed individuals. Also, having a fixed income, insurance, pensions, and employment facilities can be one of the reasons why governmental employees are less likely to suffer from severe PD.

In our study, the higher prevalence of PD among urban residents than in the suburbs, similar to the Jaisoorya study,[25] can be due to many reasons such as more stress in urban society, high cost of living, environmental pollution, reduced cultural content of human communication in large cities.

People with normal weight are less likely to be in the class of severe and low PD. While underweight people are more likely to have severe and low PD. This result may be related to the reported severe symptoms of hopelessness in these people compared to others. Feelings of hopelessness may also make them lose weight. However, the present study does not allow an accurate assessment of the cause of this problem and needs further investigation in future studies.

Examination of the coefficients of the effective variables on the symptoms of PD or the questions of the K-6 questionnaire showed that some variables, as well as being effective on the classification method, also had a significant effect on the observed variables. In this study, women reported more PD than men. Aging is also associated with increasing all symptoms except hopelessness. By increasing age, disappointment will decrease and at younger ages, the feeling of hopelessness is greater than in other ages. Married people experienced less distressing symptoms than singles.

As mentioned, among the structure of the formed classes, the amount of sadness and grief in all classes is more than other symptoms. Assessing the effect of auxiliary variables on the answer to the question related to the feeling of sadness and grief also indicates that women, divorced people, age-group of 40-49 years old and people with a diploma and undergraduate education are more likely to experience the feeling of sadness and grief. After being exposed to a traumatic or stressful event, PD is sometimes highlighted as anxiety or fear and in some cases as sadness. [7]

Increasing the level of sadness and grief among this group of people, especially in the age group of 40-49 years, who are community actives and have the greatest role in the progress and development, can hinder the progress and dynamism of a society. Even if most of the people studied in this age group are housewives, this is important because of the special role of women in the home and family environment and their impact on spouses and the education of future generations of society.

In this study, we tried to remove some of the limitations of previous studies, but this study also had some limitations as well. In this study, we studied people who refer to health centers for voluntary and optional action; some people with mental problems may not go to these centers and so to this study. Consequently, underestimates the prevalence for the general public in this study. Also, in health centers, health care workers complete the electronic file of individuals, especially the K-6 questionnaire, and there is a possibility that individuals may not be honest in answering the questions of the questionnaire; if the individuals themselves had completed the questionnaire, they would have been more honest in answering the questions. On the other hand,

most of the women who went to the health centers were pregnant or mothers who came to vaccinate their children, and we had a small percentage of single women in our database. Naturally, due to the high sample size, one of the limitations of this study is the significance of all demographic variables in fitting the regression model, which tried to solve this problem by reporting the effect size.

## Conclusion

According to the findings of this study, women than men, and divorced people than married ones are more likely to experience severe symptoms of PD, considering that women are the foundation of the family and the mother of the future generation of the country who they need special attention and care. It is suggested that in addition to further research on the cause and its clarification, the field of mental health in the family be provided through public education in the mass media and schools. Also, health centers can increase their effectiveness by continuing existing activities, focusing on these high-risk groups, and designing targeted interventions for them. Given that cultural and social conditions can be effective in controlling and managing emotions and stress, a similar plan can be implemented in other provinces and throughout Iran. In the present study, it was observed that people in all classes of PD reported feelings of sadness and grief more than other symptoms; it is suggested that in close future studies, this issue be seriously addressed, and also the causes of this issue would be investigated.

## Conflicts of Interest

The authors declare no conflict of interests.


## Funding

This study was funded by the Mashhad University of Medical Sciences (ID: 971028).


## Authors' Contributions

JJ conceptualized, designed, and supervised this study. NS and SR cleaned and analyzed the data and interpreted the results. AK contributed to the interpretation of the results. All authors contributed to the manuscript writing. All authors approved the final version of the manuscript.

**Acknowledgments**

We thank Dr. Ehsan Mussa Farkhani for providing the data. The authors thank Ms. Zohreh EmamVerdi for English editing. This study was financially supported by Mashhad University of Medical Sciences as a part of a MSc thesis (Third Author).

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**Table 1**: Demographic characteristics of the subjects

| Variables | | n (%) |
|---|---|---|
| **Gender** | Male | 116056 (27.3) |
| | Female | 309230 (72.7) |
| **Age** | 18-29 | 113149 (26.6) |
| | 30-39 | 182226 (42.8) |
| | 40-49 | 82418 (19.4) |
| | 50-59 | 42261 (9.9) |
| | 60-65 | 5232 (1.2) |
| **Marital Status** | Married | 385424 (9.6) |
| | Widow | 5448 (1.3) |
| | Absolute | 4770 (1.1) |
| | Single | 14152 (3.3) |
| **Education Level** | Illiterate | 34129 (8.0) |
| | Diploma and sub-diploma | 308337 (72.5) |
| | University | 81642 (19.2) |
| | seminary | 1084 (3.3) |
| **Job type** | Unemployed | 8737 (2.1) |
| | Government employee | 16261 (3.8) |
| | Freelance | 80230 (18.9) |
| | Other | 231884 (54.5) |
| **Residence** | Metropolis (non-marginal) | 194859 (45.8) |
| | Suburbs | 230427 (54.2) |
| **Body mass index** | Weight Loss | 10735 (2.5) |
| | Normal weight | 146726 (34.5) |
| | Overweight | 141468 (33.3) |
| | Obesity | 83869 (19.7) |
| **Total** | | 425286 (100) |

**Table 2:** Criteria for selecting the optimal number of latent classes

| Number of classes | LL | BIC | AIC | AIC3 | CAIC | LMR | BLRT | $R^2$ | entropy |
|---|---|---|---|---|---|---|---|---|---|
| **2 Class** | -2368774 | 4737950 | 4737611 | 4737642 | 4737981 | 0.00 | 0.00 | 0.86 | 0.84 |
| **3 Class** | -2283160 | 4566812 | 4566396 | 4566434 | 4566850 | 0.00 | 0.00 | 0.79 | 0.78 |
| **4 Class** | -2262141 | 4524864 | 4524372 | 4524417 | 4524909 | 0.27 | 0.00 | 0.75 | 0.76 |
| **5 Class** | -2249907 | 4500488 | 4499919 | 4499971 | 4500540 | 0.00 | 0.00 | 0.65 | 0.69 |
| **2 Class** | -2368774 | 4737950 | 4737611 | 4737642 | 4737981 | 0.00 | 0.00 | 0.86 | 0.84 |

**Table 3.** The percentage of people in each class by the percentage of answers to each question of the PD questionnaire.

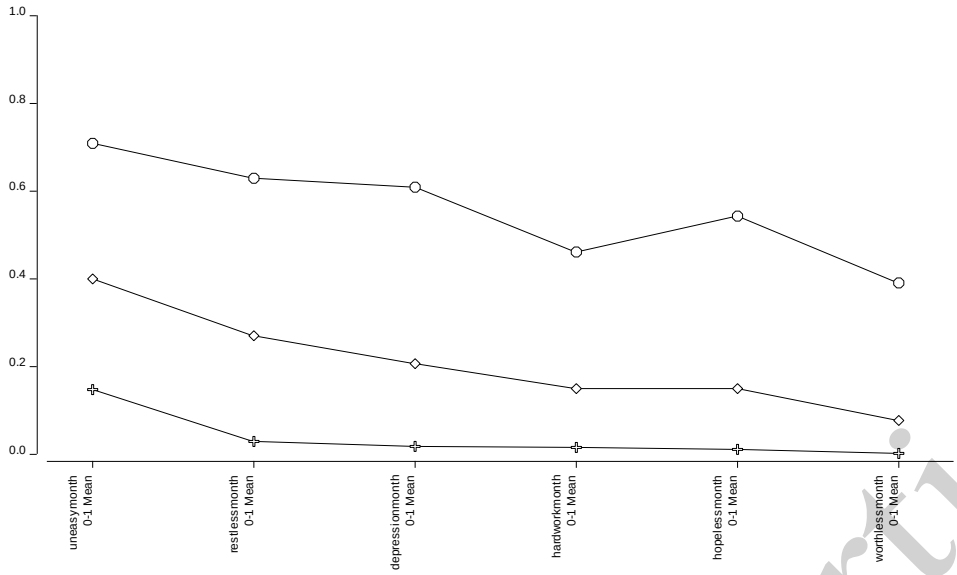
| questions of questionnaire | answers | no PD class | low PD class | severe PD class |
|---|---|---|---|---|
| **Question 1 *Sadness*** | Never / Rarely | 55.0 | 15.0 | 1.0 |
| | Slightly | 32.0 | 30.0 | 5.0 |
| | Sometimes | 12.0 | 38.0 | 28.0 |
| | most of the time | 1.0 | 15.0 | 45.0 |
| | Always | 0.0 | 2.0 | 21.0 |
| **Question 2 *Restless*** | Never / Rarely | 89.0 | 28.0 | 1.0 |
| | Slightly | 10.0 | 42.0 | 11.0 |
| | Sometimes | 1.0 | 25.0 | 37.0 |
| | most of the time | 0.0 | 5.0 | 39.0 |
| | Always | 0.0 | 0.0 | 12.0 |
| **Question 3 *Nervous*** | Never / Rarely | 93.0 | 41.0 | 1.0 |
| | Slightly | 7.0 | 39.0 | 12.0 |
| | Sometimes | 0.0 | 18.0 | 42.0 |
| | most of the time | 0.0 | 2.0 | 35.0 |
| | Always | 0.0 | 0.0 | 1.0 |
| **Question 4 *Helpless*** | Never / Rarely | 95.0 | 60.0 | 14.0 |
| | Slightly | 5.0 | 26.0 | 22.0 |
| | Sometimes | 0.0 | 12.0 | 37.0 |
| | most of the time | 0.0 | 2.0 | 21.0 |
| | Always | 0.0 | 0.0 | 6.0 |
| **Question 5 *Hopeless*** | Never / Rarely | 96.0 | 58.0 | 6.0 |
| | Slightly | 4.0 | 31.0 | 20.0 |
| | Sometimes | 0.0 | 10.0 | 39.0 |
| | most of the time | 0.0 | 1.0 | 27.0 |
| | Always | 0.0 | 0.0 | 9.0 |
| **Question 6 *Worthless*** | Never / Rarely | 99.0 | 77.0 | 23.0 |
| | Slightly | 1.0 | 18.0 | 26.0 |
| | Sometimes | 0.0 | 4.0 | 30.0 |
| | most of the time | 0.0 | 1.0 | 15.0 |
| | Always | 0.0 | 0.0 | 5.0 |
| **Class size** | | 46.00 | 40.0 | 14.0 |

524 **Table 4:** Results of Independent Variables Regression on PD Classes Using LCR

| Variables (Reference) | | low PD | severe PD |
|---|---|---|---|
| | | OR (95% CI) | OR (95% CI) |
| Age | 18-29 | Reference | |
| | 30-39 | 1.21 ** (1.19-1.24) | 1.61 ** (1.57-1.67) |
| | 40-49 | 1.42 ** (1.38-1.45) | 2.49 ** (2.40-2.58) |
| | 50-59 | 1.65 ** (1.60-1.71) | 3.21 ** (3.08-3.36) |
| | 60-65 | 1.77 ** (1.64-1.92) | 2.90 ** (2.62-3.20) |
| Gender | Male | Reference | |
| | Female | 1.18 ** (1.14-1.21) | 2.85 ** (2.70-3.00) |
| Marital Status | Married | Reference | |
| | Widow | 1.15 ** (1.07-1.24) | 1.60 ** (1.43-1.74) |
| | Divorced | 1.40 ** (1.30-1.51) | 2.18 ** (2.00-2.37) |
| | Single | 0.99 (0.95-1.04) | 1.49 ** (1.40-1.58) |
| Education Level | Illiterate | Reference | |
| | Diploma and sub-diploma | 0.99 (0.95-1.02) | 1.00 (0.96-1.05) |
| | University | 0.96 (0.93-1.00) | 0.67 ** (0.64-0.71) |
| | Seminary | 0.85 * (0.73-0.99) | 0.54 ** (0.40-0.73) |
| Job type | Unemployed | Reference | |
| | Government employee | 0.98 (0.92-1.04) | 0.59 ** (0.54-0.66) |
| | Freelance | 1.06 (1.00-1.11) | 0.90 * (0.83-0.98) |
| | Other | 1.08 ** (1.02-1.14) | 0.96 (0.88-1.04) |
| Residence | Suburbs | Reference | |
| | Metropolis | 1.06 ** (1.05-1.08) | 1.16 ** (1.14-1.91) |
| Body mass index | Obesity | Reference | |
| | Weight Loss | 1.09 ** (1.04-1.15) | 1.38 ** (1.29-1.48) |
| | Normal weight | 1.00 (0.98-1.02) | 0.88 ** (0.85-0.91) |
| | Overweight | 1.04 ** (1.02-1.06) | 0.92 ** (0.89-0.95) |

525 **p < 0.05; **p < 0.01; Reference Category: No PD*

526




527

528 **Figure 1:** A pattern of answering the questions of the K-6 questionnaire based on the LCR

529 model