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## REVIEW ON ASSESSMENT OF DEPRESSION BY BECK DEPRESSION INVENTORY (BDI) AND HAMILTON DEPRESSION RATING SCALE (HDRS)

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### Abstract:

*The study aimed at investigating how to apply two familiar tools for measuring depression among diabetic patients in Iran. The study discusses about two inventories and emphasizes that depression is such an important issue that needs to receive a great deal of attention in order to create grounds to be prevented or cured. The issue of concept of tools was also discussed in the study. The discussion in the paper is based on the conceptual framework of Beck Depression Inventory (BDI) and Hamilton Depression Rating Scale (HDRS). These tools are appropriate for the study because they allow the reader to understand how to measure and identify symptoms of depression. The paper recommends that the tools should be carefully applied in order to improve mental health and reduce the prevalence of depression.*

### Keywords:

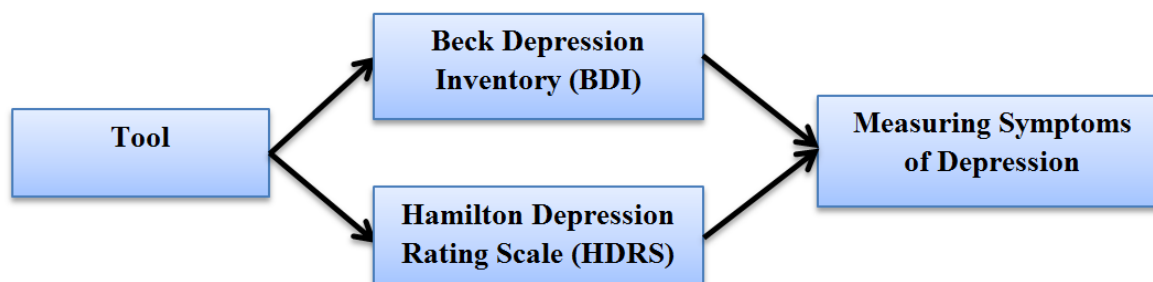
*Depression, Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDRS).*

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## 1. INTRODUCTION

Depression is one of the diseases that affects the people and can change the personality of people, people cannot make decision, and they cannot feel any pleasure in their life; so the first step of treating depression among people is by using the tools for evaluating of depression. The term depression clinically refers to something more than simply a state of unhappy mood. It is regarded as a syndrome which involves depressed mood coupled with disorders, psychomotor changes and some other somatic and vegetative difficulties (Bentall, 1999). According to Peveler, Carson and Rodin (2002), depression is an emotional problem which is identifiable with symptoms like constant and developing low mood as well as loss of interest or pleasure in normal activities. Individuals who suffer from serious medical conditions are highly likely to become depressed (Nordin, Berglund, Glimelius & Sjoden, 2001). Depression relates to an extensive domain of mental health problems specified by the lack of a positive effect (a loss of interest and enjoyment in ordinary things and experiences), low mood and a range of related emotional, cognitive, physical and behavioural symptoms. Differentiating the mood changes between clinical significant degrees of depression (for example, major depression and those happening normally) remains problematic. It is advisable to view depression symptoms as happening on a continuum of severity (Lewinsohn, Solomon, Seeley & Zeiss, 2000). In addition

to subjective suffering experienced by those who are depressed, the influence on social and occupational functioning, physical health and mortality is fundamental. Depressive disorder the aim of this study is to review the two important tools which imply Beck Depression Inventory (BDI) and Hamilton Depression Rating Scale (HDRS) in order to measure the symptom of depression and determine the level of depression among depressed patients.



*Figure 1:* Conceptual Research Framework

## 2. TOOLS

### 2.1 BECK DEPRESSION INVENTORY (BDI)

Over the years, Beck Depression Inventory (BDI) has become one of the most widely used instruments both for assessing the intensity of depression in psychiatric diagnose patient (Piotrowski, Sherry & Keller, 1985) and for detecting possible depression in normal population (Beck & Steer, 1984). The presence of depression symptoms in diabetic patient in this research can be evaluated using the Beck Depression Inventory (Beck, Steer & Brown, 1996) where this questionnaire can also be referred to as a self-report questionnaire of depressive symptoms. Besides, this questionnaire is also designed to measure the frequency and intensity of depressive symptoms that is faced by individuals (Beck, Ward, Mendelson, Mock & Erbaugh, 1961).

### 2.2 APPLICATION OF BECK DEPRESSION INVENTORY (BDI)

The Beck Depression Inventory (BDI) sometimes called Self-report Inventory contains questionnaires which mainly concentrate on the cognitive distortions that emphasize depression (Beck & Steer, 1987). Beck et al. (1996) declare that from different research, it is broadly acknowledged that the psychometric qualities of the BDI are supposed to be quite right. In this study, the researcher uses Beck depression inventory (BDI) which is both a reliable and valid measure of the severity of depression. It requires a self-rating from 0 to 3 on each of 21 items; a cumulative total from the addition of individual symptom scores is recorded.

There are a total of 21 items in this self-report instrument with each item having a total of 4-point Likert scale. This questionnaire quantifies a range of depressive symptoms which include moods, pessimism, self-dislike social withdrawal and work difficulties. In each item, there will be four statements which will then be used to represent the severity level of depression that is faced by the diabetic patients. These statements will come together with a scale that range from 0 to 3 which can be used to measure the severity of the depression of the patient. This questionnaire

comprises of 3 sections namely Self- denigration, Physical function and affect. Self- denigration contains 6 items, Physical function is having 7 items and affect which is the last section has 8 items.

### 2.3 DEVELOPMENT OF SCALES

#### 2.3.1 VALIDITY AND RELIABILITY OF BECK DEPRESSION INVENTORY (BDI)

Validity of an instrument can be defined as an extent to which the theory or questionnaire can be applied in similar phenomena (Lee & Baskerville, 2003). Validity of a questionnaire plays an important role to ensure the suitability of that questionnaire to be applied in research because if a questionnaire has low validity, it is not valid and cannot be used to test what it is supposed to. Beck Depression Inventory is reported to have excellent validity for its suitability to be used to measure depression in individual. Beck et al. (1988) has found a mean correlation of .72 between clinical ratings of depression and the BDI for psychiatric patients and a mean correlation of .60 between clinical ratings of depression and BDI scores for non-psychiatric patients.

Reliability can be defined as dependability or consistency where the same thing is repeated or reoccurs under similar condition (Neuman, 2005). Reliability of a research instrument can be meant by the consistency of the instrument to produce identical results despite being used in different settings and so on. This concept of reliability is closely related to universality, repeatability, and consequently falsification (Lee & Baskerville, 2003). Beck Depression Inventory questionnaire has been reported to have a very good to excellent reliability. Split-half reliability for this questionnaire has been reported to be ranging from .78 to .93. This result indicates an excellent internal consistency (Beck & Steer, 1984). Besides, in test-retest examination, this inventory has also been reported to have good reliabilities with a range of .48 for psychiatric patients after three weeks to .74 for undergraduate students after three months (Cororan & Fischer, 1987).

**Table1:** Validity and Reliability of Beck Depression Inventory (BDI)

Researcher	Year	Validity	Reliability
AlMusawi	2001	84	
Storch et al.	2004	90-91	
Ghassemzadeh	2005	0.87	
Al-Musawi	2001		73-96
Kapci et al.	2008		

Source: Ghassemzadeh et al. (2005)

#### 2.4 SCORING OF BECK DEPRESSION INVENTORY (BDI)

The Beck Depression Inventory (BDI) (Beck, Ward, Mendelson, Mock & Erbaugh, 1961) is usually employed to measure the level of symptom intensity during the first and the last weeks of treatment. Beck et al. (1961) state that BDI categories consist of these levels: severely depressed (>25), moderately depressed (16-24), and mildly depressed 10-15.

**Table2:** The Standard Cut-offs of Depression

Classification	Total Score	Level of depression
Mild depression	10-18	Mild
Moderate depression	19-29	Moderate
Severe depression	30-63	Major

Source: Beck et al. (1988)

### 3. HAMILTON DEPRESSION RATING SCALE (HDRS)

The Hamilton Depression Rating Scale (HDRS) is the standardized scale for the measurement of the severity of depressive symptoms which was developed during the late 1950s (Hamilton 1960). The HDRS was regarded to be the most widely used scale for patient selection and follow up in research studies of treatments for depression since from the time of its initial publication (Hedlund, Vieweg 1979; Carroll, Fielding, Blashki 1973). Its comprehensive coverage of depressive symptoms and related psychopathology, as well as its strong psychometric properties made it to be successful (Hedlund, Vieweg 1979; Rehm, O'Hara 1985). The validity and reliability of this scale has been proven in numerous studies through the total HDRS score (Carroll, Fielding, Blashki 1973).

Hamilton Depression Rating Scale (HDRS) is one of the most reliable scales in depression assessment designed by Max Hamilton in 1960. The scale is performed by a trained person and it is the most suitable instrument for a semi-structured interview based on DSM-VI criteria. (Williams et. al, 2008). Initially, the scale was designed to yield a total score based on 17 out of its 21 items. But many investigators have used all 21 items in order to suit their studies objectives (Hedlund, Vieweg 1979).

#### 3.1 KEY SCORE OF HAMILTON DEPRESSION RATING SCALE (HDRS)

Hamilton Depression Rating Scale (HDRS) is a scale used to score the items in qualitative data. In this rating scale the score of each item will be summed up in order to get final result. In other word the total score of this scale is obtained by summing up the score of each item, 0–4

(symptom is absent, mild, moderate, or severe) or 0–2 (absent, slight or trivial, clearly present). For the 17-item version, scores can range from 0 to 54.

### 3.2 CUT-OFF SCORES

Most clinicians are of the view that scores between 0 and 6 do not indicate the presence of depression, where by scores between 7 and 17 indicate mild depression. When scores range between 18 to 24 it indicate moderate depression, and scores over 24 indicate severe depression respectively (Frank, Prien, Jarrett, Keller, Kupfer, Lavori and Weissman, 1991).

**Table 3:** Score of Hamilton Depression Rate Scale (HDRS)

Classification	Total Score	Level of depression
Normal	0-6	Normal
Mild	7-17	Mild
Moderately severe	18-24	Moderately severe
Severe depression	>24	Major depression, severe

Source: Frank et al (1991)

### 3.3 DEVELOPMENT OF THE SCALE

#### 3.3.1 VALIDITY AND RELIABILITY OF HAMILTON DEPRESSION RATING SCALE (HDRS)

According to Hamilton (2000) for the validity to be accepted and used for research purpose it must range from 0.65 to 0.90 with global measures of depression severity, and at the same time it must be highly correlated with clinician-rated measures. When using the Structured Interview Guide Test–retest reliability for the HAM-D will be recommended at the high level of 0.81, even among minimally trained raters from multiple disciplines (Williams, 1988; Takahashi, 2004). The internal consistency of different versions of HAM-D was shown by a number of studies to range widely from 0.48 to 0.92. According to Hamilton 2000 structured interview is used to reach the higher coefficient alpha values for more details. Other studies reported internal consistency coefficients of 0.83 for HAM-D-17 and 0.88 for HAM-D (Rush et al., 2003).

A total of seventy (70) studies on psychometric properties of the HAM-D, which had been published since 1979, confirmed that majority of HAM-D items have adequate reliability (Bagby, Ryder, Schuller & Marshall, 2004). Cronbach's alpha statistic is another means used to evaluate internal reliability (Cronbach, 1951). Previous studies (Briggs & Cheek, 1986; Nunnally & Bernstein, 1994) indicated that the internal reliability of individual items is calculated by using corrected item-to-total correlation with Pearson's  $r$ ; items should have a correlation greater than 0.20. Evidences were provided by some investigators (Cicchetti & Prusoff, 1983; Demitrack, Faries, Herrera, DeBrotta & Potter, 1997) that reliability can be affected by the skill level or expertise of the interviewer and the provision of structured queries and scoring guidelines.

**Table 4:** Validity and reliability of Hamilton Depression Rating Scale (HDRS)

Study	Year	Sample	N	Validity	Reliability
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Aben et al.	2002	Stroke Patients	202	×	×
Akdemir et a	2001	Psychiatric Patients	94	×	×
Addington et al. (10)	1996	Schizophrenia in Patients	112		×
Leentjens et al.	2000	Parkinson's Disease Patients	63	×	×

Source: Michael et al. (2004)

#### 4. STRENGTH AND LIMITATIONS OF THE TOOLS

As mentioned in the literature review, Beck Depression Inventory (BDI) and Hamilton Depression Rating Scale (HDRS) are two kinds of instruments appropriately used for measuring symptoms of depression; this is due to the high validity and reliability of these instruments. In addition, these instruments have several benefits some of which include 1) High validity and reliability. 2) Scoring are standard and the Tools can be used to measure many symptoms of depression.

Limitations of the tools: Although, these tools are said to be suitable for measuring depression due to their high validity and reliability, still they have several limitations such as; different settings that are usually affecting the generalizability of the results some of which are: 1) Environmental problems like light, voice, etc 2) Emotional problems during the test and Time constrain. Secondly, issues affecting the result obtained from these tools and gender effect on the result. Other limitations include self-report nature of the BDI and HDRS that can affect its results according to some factors such as respondent educational attainment, gender effect of the condition and social desirability.

#### 5. FUTURE DEVELOPMENTS

Depression is said to be a common mental disorder in both non-clinical and clinical conditions. Researcher in clinical centre should consider the following: first of all the tools should be carefully applied in order to improve mental health and reduce the prevalence of depression. Secondly regarding to changing of the characteristics of human being which may occur in future, psychometrics should try to improve the program of the tools and methods for the successful assessment of depression. Thirdly, using the computer to evaluate depression in the sitting and the last comments involved updating and reviewing scientific literature which needs to summarize the growing body of psychometric literature on self-report measures of depression, the BDI-II and HDRS are some of these scientific literatures.

## 6. CONCLUSIONS

Depression is the disease that can affect everyone in all stages of life. For measuring of symptom of depression many instruments can be used. This study explained two kinds of assessment which include; Beck Depression Inventory (BDI), Hamilton Depression Rating Scale (HDR). The paper recommends that the tools should be carefully applied in order to improve mental health and reduce the prevalence of depression.

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