

The Underlying Bio-Psychosocial Factors in Depressed Patients Exposed by Factor Analysis

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ABSTRACT

Introduction: According to WHO 2018 Depression is the leading cause of disability worldwide and is a major contributor to the overall global burden of disease, with more than 300 million people affected. Depression is an extremely complex condition with a plethora of causative risk factors such as biological, environmental, co-occurring disorders. Without a coherent theory and unitary model, the treatment and resources such as the development of drugs would appear to be elusive. This research aims to continue along the lines of research investigating the biopsychic social correlations and risk factor associated with a depressive illness. The aim is to determine how these risk factors work together, by beginning with the patients themselves, in an attempt to understand and define the underlying emotions, thoughts, attitudes, feelings and behavior of depressed patients.

Method: A questionnaire was designed to quantify self-defeating ideation; The Self-Defeating Quotient – SDQ. The aim was to: Segregate depressed patients from a normal control; Examine if personality dimensions correlate with the SDQ Results. From 36 multifactorial psychosocial variables 11 factors were identified which had a clear interpretation and appeared to represent latent states in the depressed patients. The state formed a hierarchical relationship and correlated with some personality dimensions.

Conclusion: The results suggested this avenue of investigation could throw more light in the refinement and understanding of patients with depression.

Keywords: Bio-psychosocial factors, Self-defeating quotient, Depressed patients, Factor analysis

INTRODUCTION

Depression has many dimensions; social, biological, genetic, cultural and personality these factors suffer from lack integration [1-8]. There is no one accepted theory of depression and treatment may often depend on the training of the psychiatrist. This disjointed approach leads to fragmentation and a lack of cohesion of treatment resources and terminology. Research suffers and lacks robust repeatable studies, which can be useful and influential across the domain of depression. Some researchers describe mental disorders as “producing a wide range of distressing symptoms. Patients may suffer from profound gloom of depression, the terror of panic attack, or the disturbing unreality of psychosis”. They believed that “Most forms of illness require an etiological model that assumes that only the cumulative and interactive effects of many causal factors can account for a certain percentage of the overall risk.”

The cumulative effects of the multiple factors that lead to psychopathology can be understood through a model that called the bio psychosocial model. The original theory by

Engel [9] was a general systems theory in which no etiological factor had primacy over any other. However, Cloninger et al. [10] believes that differences in biological vulnerability explained why some individuals do not necessarily develop mental illness when they experience stress, as well as why, under the same stress, one person will develop one type of illness and another person will develop a different illness. The present study followed a mortality study whereby patients diagnosed with depression were found to die prematurely from both unnatural and natural causes.

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A questionnaire was designed to try to understand the mediating mechanisms in general and more specifically the underlying traits associated with a depressive illness. The aim was to examine in more exhaustive detail the thoughts, attitudes, feelings and the behavior of depressed patients. To focus particularly on aspects of development, social functioning and integration personality and psychological factors, which predispose or undermine health, and which could be interpreted as self-defeating. Or as suggested, "The endeavoring to refine the present understanding of patients with depression the human and the social aspect".

A tool was necessary which would:

- Quantify self-defeating behavior.
- Segregate depressed patients from a normal control group.
- Examine if personality dimensions correlate with the tool.

The tool designed was called the Self-Destructive Quotient or the SDQ. The SDQ was designed as a two part, anonymous, self-administered, questionnaire. It includes demographic information such as age, sex, employment status and the presence of existing physical and psychological disorder.

Part 1 is called the SDQ "Now" it consists of 36 multifactorial variables and measures feelings, behavior, social relationships and attitudes as they are at present. 36 biopsychosocial variables including attitudes towards; family, education, relationship, community country affiliation, emotions, stressors, etc.

Part 2 of the SDQ is called the SDQ "Ideal" it is exactly the same as part 1 but asks respondents to score how they would "Ideally" like to answer.

The difference between the two scores is the SDQ quotient.

Each of the 36 questions is answered by placing a cross on a line.

Positive 0-----*-----100 Negative

The SDQ is designed as both:

- A therapeutic tool, which can be used to promote change.
- A research tool with which to gain new insights into depression.

HYPOTHESES

Hypothesis 1

A priori hypothesis: Depressed patients will have a higher SDQ 'Now' score than the controls tested. A one tailed two-sample t-test will be used.

Hypothesis 2

A priori hypotheses: Depressed patients will have different SDQ Ideal scores from the controls. A one tail two sample t-test will be used.

Hypothesis 3

Hypothesis 3 the SDQ will correlate with the Eysenck Personality Questionnaire.

The statistical analysis was therefore straightforward. Two sets of scores were obtained from each respondent, by answering the questionnaire first to fit their present position as:

'Now 'and secondly how they would 'Ideally' answer the questionnaire. The discrepancy between the two scores provided a discrepancy quotient.

The Eysenck Personality Questionnaire (EPQ) [11] was also used to measure the four dimensions of personality: Psychoticism, Introversion/Extroversion, Neuroticism, and a Dissimulation score.

The test groups were patients referred to a psychiatrist and diagnosed as depressed in an outpatient department. The questionnaires were enclosed in a stamped addressed envelope and accompanied by an Information sheet. Every depressed patient was invited to complete a questionnaire while they awaited the consultation with the psychiatrist. They could then post the completed questionnaires to the researcher. Most patients chose to give the questionnaires to the psychiatrist during the consultation.

The controls were groups of people working in various settings not being treated for mental illness.

RESULTS

This study evaluated a sample of 94 of which 54 (57%) were diagnosed with clinical depression and 39 normal controls (42%). There were 42% males and 56.4 females in the study. The mean age of the population under test was 53.77 and for the control group it was 51.74 approximately 65% of the sample was employed either full-time or part-time. A pre-existing medical condition was present in 56.7% of the depressed patient group compared with only 43% of the control.

Results (hypotheses 1 and 2 were apriori one tailed tests)

Hypothesis: The test population had an average SDQ Now score of 30.8 versus 35.2 for the control (one tailed $P=0.029$). Thus hypothesis 1 is significant. This was the expected result; a depressive illness is associated with pessimism, rumination, and a decline in function with social, physical, medical and economic consequences.

Hypothesis 2: The average Ideal score was 13.0 for the control group versus 13.7 (for the depressed groups, respectively ($p=0.7$)). Although there was a larger difference

for the depressed patients than the controls, the difference between the two groups was not statistically significant. Thus, we conclude that the average SDQ Ideal score is not associated with being depressed versus non-depressed. This result may suggest that the depressed patients are not unlike the normal controls when it comes to having choices and aspirations, concerning their ideals. They appear not to have lost sight of their ideal. It gives some indication for their depression. That there is to them an un-accessible divide separating them from the rest of the world.

The average difference between the Now-Ideal score was 17.8 ($P < 0.0001$). For the depressed group, compared with the average difference between the (Now-Ideal) in score was 21.5 ($P < 0.0001$) for the controls. Thus, we conclude that both groups had a statistically significantly larger Now score compared to their Ideal score.

To see if the difference was the same in both groups, a two-sample t-test was performed to compare the difference (Now-Ideal) 17.8 versus 21.5 for the control and depressed groups, respectively ($P = 0.065$). Thus, we conclude that there is insufficient evidence to suggest the difference between Now and Ideal, is different for the two groups.

Hypothesis 3: The SDQ Now score was statistically significantly associated with each of the EPQ subscales except for extraversion. The correlation coefficients were 0.54 for Psychoticism ($P = 0.0001$); -0.17 for extraversion ($P = 0.19$); 0.44 for Neuroticism ($P = 0.0001$ and; -0.29 for dissimulation ($P = 0.025$)). The correlation was positive between the Now score for Psychoticism and Neuroticism. There was a negative association between Now score and dissimulation. That is: larger Now scores are associated with smaller dissimulation scores.

Factor analysis SDQ – NOW score

A solution was produced using principal components extraction, which was then rotated using the varimax method for ease of interpretation. Components with Eigen values greater than 1 were selected for further study. The correlations between The SDQ Now scores and each of the factors Now scores were greater than zero meaning larger factors Now scores are associated with larger factor scores.

The communalities indicate the amount of variance in each of the 36 questions that is accounted for by the selected factors, these ranged from 0.6 to 0.857. This suggests the factors represent the original questions very well. The first eleven factors explain 75% of the total variation in the 36 questions. This suggests that from a data analysis standpoint, the 11 factors could be used instead of the 36 questions and still retains 75% of the information contained in the original 36 questions (**Table 1**).

Table 1. Factors: The rotated component matrix helped to determine what the components represent.

Factor 1: Family time, family, childhood, jealousy, education.
Factor 2: Contentment, control, optimism, frustration.
Factor 3: Community, exercise, conservation, neighbors and elections.
Factor 4: Country, initiative, diet.
Factor 5: Temper, aggression.
Factor 6: Altruism, vandalism, colleagues, work.
Factor 7: Weight, stress, debt, honesty.
Factor 8: Destruction, Adult training.
Factor 9: Drugs, law.
Factor 10: Alcohol, smoking, care.
Factor 11: Problems, philosophy.

Discussion states identified as a result of the factors:

Factor 1: This suggests that what has occurred in the past remains firmly within the context of the family and childhood experience and education. These experiences influence the present and by implication the future. For example, family and not spending enough time with the family is associated with childhood and education, which is suggestive of producing a legacy of neglect. Jealousy becomes understandable in these circumstances where the lacking family background has jeopardized the present. Jealousy is aroused in a triangular relationship where hostility is expressed at the competitor, envy relates to rank and the recognition that someone has resources or qualities that one wants for oneself. Nevertheless, as Rutter shows some rise above circumstances. "All studies of deprived or disadvantaged children have noted wide variations in response. Even with the most terrible homes and the most stressful experiences some individuals come through unscathed and seem to have a stable healthy personality development" This finding suggests that the consequences appear to be dependent on personal traits which suggest personality is the arbitrator. This factor could also be associated with the attribution of blame and that in some individuals this apportionment of blame hinders motivation to change or to accept personal responsibility for personal circumstances.

Factor 2: Links control, contentment, optimism and frustration. The underlying states appear to be that contentment, optimism, and frustration, are dependent on the feeling of being in control. It gives support to Seligman [12] work associating depression with learned helplessness,

inaction associated with depression and the feeling that whatever efforts are made they are doomed to fail. Certain researchers believed that self-efficacy beliefs are important mediating mechanisms in how much control people feel they have over their lives. Theories of human motivation have identified several psychological needs, including needs for achievement, for positive social regard, for self-actualization, for respect from others and for control over the effects of one's actions. This factor suggests a preoccupation with negative feelings, which make change difficult. It can also be linked to factor 1 if the negative feelings associated with factor 1 produce an impasse then there can be no control contentment, optimism but it is easy to see that frustration is the result.

Factor 3: Community, exercise, conservation, neighbors and elections appears to reflect self-absorbed attitudes with no incentive to take responsibility for self or for others. This factor can be understood if considered from the point of view of the depressed patient influenced by the previous factors, i.e., a preoccupation with self.

Factor 4: Country, initiative and diet are analogous to factor 3 and reflect an inability to become involved or concerned about the wider external world. The inhibition of taking the initiative can be a state affected by low mood but also a trait. "Some submissive individuals avoid taking the initiative as a general subordinate style. Individuals who do not take the initiative cannot direct positive social attention to them and hence tend to get ignored and are experienced as unrewarding. Moreover, others as not being interested can sometimes read failing to take initiative, which activates resentment. This can set up a vicious circle of needing more cues of reassurance or feeling inferior because one is often ignored".

Factor 5: It is unmistakably concerned with the emotions and pent up aggression and anger, a reaction to personal feelings and circumstances. Gilbert summarizes the role of anger in depression by saying "the role of anger in depression has fascinated researchers for many years and there is now little doubt that depression is associated with anger control. However, there may be different types of anger. Some may have anger attacks, others may have temper tantrums and others may suffer from an elevated threshold for frustrative aggression. The role of rank (when and to whom anger is expressed) is still to be fully researched".

Factor 6: Altruism, vandalism, colleagues, work, are variables amalgamated by an unconcerned view of social issues. Gilbert associates the evolutionary root of guilt is probably associated with cooperation, reciprocal altruism, and care giving. Shame however, centres on issues of defeat, intrusion, encroachment, injury and ultimately destruction of the self.

Factor 7: Weight, honesty, stress, debt, are factors, which escalate if not confronted and taken under control. Which have a connection to factor 1. Stress identified as the general adaptation response to long-term stress, which could lower resistance to illness. Chronic stress has been linked to locus of control and to Type A and B behavior. The present author linked stress with personality, bodily symptoms and failure to respond to treatment in patients attending a psychiatric day unit. Patients scoring high in Psychoticism failed to benefit from the treatment, in fact they appeared to be worse when examined 3 months after their discharge. Social expectations are expectations others may have, which can then become self-fulfilling. Parents who express high expectations of their children in terms of honesty and conscience tend to have children who live up to those expectations. Some showed that the beliefs that people have about how much they can control situations can make a great difference to the amount of stress they experience. People with an internal locus of control who believe that control of their lives largely comes from their own efforts experience less stress than those with an external locus of control who believe they are largely victims of circumstance.

Factor 8: Destruction and adult training are interesting associations. Destruction was a philosophical question asking if cooperation could make the world a less destructive place and the adult training was questioning satisfaction with adult training with implications for satisfaction with a resultant career. Thus, attitudes appear to be related to outcome. Putting it in the context of failure with training it appears that once again both factors are perceived to be beyond the control of the individual.

Factor 9: Drugs and Law are inextricably linked in society, and these results confirm that this is also the case in the groups examined.

Factor 10: Alcohol, smoking and care suggest that respondents are using smoking and alcohol as an alternative to treatment or care in an environment, which they find stressful. The implication is they need to engage in addictive activities because the stress they generate leads to the feeling of helplessness and a lack of control. Factors 9 and 10 appear to be united as activities associated with coping with intolerable situations. This could be viewed as measures of self-help. They appear to have an amalgam of multitudinal difficulties and drug, smoking and alcohol, are available to them as mood altering in the same way as antidepressants. Earlier compliance was discussed and that one in 2 patients do not comply with the drugs prescribed, in this group they are the ones prescribing which gives them some control over their mood, in a life which they exert little control.

Factor 11: Problems and philosophy, these relate to problems which need resolving, and to a philosophical question which asked respondents if they agreed with the statement "As you make your bed so must lie on it" Once again as in factor 8 a philosophical question is linked to

problems showing that attitudes and strongly held opinions are related to outcomes. This concluding factor summarizes all the factors and if there had to be 1 factor it would be that depressed patients lie on beds unmade.

SUMMARY OF THE FACTOR ANALYSIS

“Since psychopathology is concerned primarily with brain function and since the brain evolved as the organ for tracking social success”, then it follows that at some level the social milieu in which we grow and live must enter our research endeavors and theory building. A depressive illness is often associated with various patterns of affect and behaviors and very few assessment instruments tap this complexity of ranking behavior and sense of identity”. The factors produced by the SDQ collectively provide a clear picture of negative attitudes, behavior and feelings. Factor 1 shows clearly that the family is the basic foundation in which states and traits are embedded. This may include genetic, developmental and social components. It also appears that if this is perceived to be lacking that control and the feeling of control have a pervasive effect throughout life. Further the results suggest that they then become insular taking no responsibility for themselves or for other, with implications that circumstances are to blame not themselves. It may be taking this result too far, but these depressed patients appear to feel “nobody helps me so I will not help or be concerned with others” This attitude holds for wider issues involving the country and the inability to take any initiative.

Factor 6 suggests Gilbert associates the reaction to this inability to move on but to stagnating remaining unconcerned to shame.

Factor 7 introduces stress, which suggests stress is the reaction to the predicament. At this point it is possible to account for the relationship between a functional illness and a physical disorder via stress and the GAS hypothesis of Selye.

Factor 8 links the attitude of hopelessness with career via adult training inadequacies. This might have implications for economic status

Factor 9 reflects the views of society on drugs and lawlessness.

Factor 10 suggests alcohol and smoking are self-help mood-altering remedies.

While finally factor 11 endorses all the previous factors collectively.

Personality showed the association with the SDQ Now score and Psychoticism and neuroticism and a negative association with dissimulation. In other words, a high SDQ Now score is associated with high scores for Psychoticism and Neuroticism but not with extraversion.

DISCUSSION

A new approach was used to quantify thoughts feelings and behavior captured by the SDQ, which could be useful in adding the “human and social side” of a depressive illness. Various points emerged throughout the study:

Patients welcomed being involved and although it was not part of the remit of the psychiatrist, clearly patients expected to discuss their questionnaires during the consultation. By completing the questionnaires patients were identifying a discrepancy between their “Now” and “Ideal” scores and gaining insight into the discrepancy between them. The psychiatrist was surprised by the results he did see and felt important information had been ignored in his own assessment. With hind-sight if he had had the time, he would have used the questionnaires to initiate the therapeutic process. Patients were left without feedback, which they were clearly expecting to receive.

The review highlighted the prevalence, the plight, and the gravity of the depressed patients. The mortality study demonstrated the seriousness associated with the diagnosis. A proportion take their own lives, a further proportion will die prematurely from natural causes what happens to the remainder we do not know. The SDQ shows that their lifestyles are burdened with an amalgam of self-defeating thoughts, emotions, feelings, attitudes, and behavior with the accompanying social and economic consequences. The personality questionnaire confirmed the importance of including measures of personality and the contribution personality makes in the human and social aspect of the past, present and future, of the individual.

The results also appeared to demonstrate that the depressed patients, despite being depressed they had not lost sight of their ideals and that they held the same aspirations as the controls. This implied that they could via the SDQ distinguish between their present and their preferred ideal. It also demonstrated that patients who tend to be plagued by self-analysis and trying to make sense and understand their illness could relate to the SDQ. It appeared to help them put themselves in the context of normality without reinforcing their negative responses or apportioning blame. In other words, they could relate to the individual variables, which had meaning for them, while also linking them together as a whole. It says nothing about whether they could influence or achieve a move towards a more positive situation with help, or whether it provided some stepping stone whereby their pre-occupations were grounded with new insights.

What would be the treatment of choice to challenge this amalgam of self-defeating ideation? Jamison [13] suggests that for every patient who complies with their prescribed drug doses there is another one who takes too little, too much or none at all. This appears to suggest drugs are not the preferred treatment of choice for the patient with depression. Is it being too optimistic to speculate that by

using the SDQ to confront the feelings and function which underlie depression that some patients would respond and that the intervention would stop the biopsychosocial deterioration? While collecting and monitoring the data the prevailing thought was that an opportunity was being missed and that these particular patients were being let down. A process was started but there was no opportunity to progress [14].

It is hoped that this particular line of research can continue including a larger sample with refinements following the lessons learnt from this the original pilot study into self-defeating ideation.

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