



Manuscript 1033

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ORIGINAL STUDY

Treatment Burden, Not Health Risk Attitude Associated with Adherence in Patients with Mental Illness in South India[☆]

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Abstract

Background: Attitude towards health risks and treatment burden may mediate treatment adherence in therapeutic care. There is a paucity of study examining the levels and relationships of these variables in patients with mental illness.

Objective: This study was conducted to know the relationships of health risk attitude & treatment burden and medication adherence in patients with mental illness.

Settings and design: Cross-sectional, Hospital-based study.

Methods and material: One hundred seventy consecutive participants in remission of mental illness were recruited. The patient's details were assessed with Sociodemographic proforma while attitude towards health risk was assessed with Health-Risk Attitude Scale (HRAS). To evaluate the burden of treatment, the Treatment Burden Questionnaire (TBQ) was used while medication adherence was rated with the Medication Adherence Rating Scale (MARS).

Statistical analysis used: Descriptive statistics, Kruskal–Wallis H, Linear regression analysis.

Results: Mean score on MARS was 4.9 (SD ± 1.7) while HRAS and TBQ were 62.2 (SD ± 8.6) and 44.2 (SD ± 23). On linear regression analysis scores of TBQ were statistically significant positively linked to HRAS score ($R^2 = .35$, $df = 1$, $F = 94.2$, $p = 0.001$), While Scores on MARS were statistically significant negatively linked TBQ and HRAS score ($R^2 = .53$, $df = 2$, $F = 97.1$, $p = 0.001$).

Conclusions: Health risk aversion and treatment burden may upraise in mentally ill, and linked to poor medication adherence.

Keywords: Health attitude, Treatment burden, Medication adherence, Mental illness

Key messages

Belief about health risk and treatment burden may adversely affect the medication adherence in the mentally ill. They need to be addressed to improve the overall outcome.

1. Introduction

Risk attitude is conceptualized as a mindset towards taking or avoiding risk when deciding how to proceed in situations with uncertain outcomes [1]. It is an internal human mental process and positioning to the chosen response to a situation. Health-risk attitude is how a person values their health and manages the health risks [2].

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Received 20 February 2023; revised 9 March 2023; accepted 9 March 2023.
Available online 14 June 2023

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<https://doi.org/10.55691/2278-344X.1033>

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Understanding health risk attitude may help the health care provider to understand the variations in treatment preference and health care utilization [3]. Previous surveys among the general population found that most people tend to be risk-averse, a small group of people to be risk seekers and few to be risk-neutral [4–6], and certain population characteristics to be associated with health risk attitude [6–8]. Differences in health risk attitude may lead to healthy or health risky behavior [9]. Lesser health risks may be associated with more risk-seeking [10,11], than in turn leads to lower healthcare utilization [12]. During decision-making under uncertainty, attitude towards health risks mediates treatment preference, and medical decision making [2,13]. Though few studies have examined the health-risk attitude studied in few physical illnesses, there is hardly any study that examined this variable in patients with mental illness.

Treatment burden is the impact of health care on patients' functioning and well-being [14,15]. It includes everything that patients do to take care of their health such as visiting the doctor, conducting medical tests, treatment management, and changes in the lifestyle. This work can represent a tremendous investment of time, attention, cognitive energy, and effort [16]. Difficulties with the treatment are often not shared in-depth by patients during medical consultations [17], and physicians are often not aware of the challenges their patients face in coping with everything asked of them [18]. For patients, the treatment burden could be considered a crucial outcome for disease management [19]. Few attempts have been made to assess some aspects of burden in such as the burden of care, the financial burden in some psychiatric disorders however comprehensive evaluation was not considered using standardized assessment tools. In this initial study, all psychiatric disorder was considered for evaluation to explore the nature of relationships.

Adherence is the extent to which a person's behaviour corresponds with agreed recommendations from a health care provider [20]. Non-adherence is a major obstacle to recovery from a mental illness. Systemic review and metanalysis attributed it to be related to individual patient's behaviours, lack of social support, clinical or treatment and illness-related, and health system factors [21]. A significant proportion of the patients are poorly adherent due to psychological factors such as attitudes and beliefs about treatment [22-25]. Most studies focused on the clinician perspective of patient's non-adherence, and in the era of Personalized Medicine, there is a need to explore patients perspective of illness and its relationship with

Abbreviations used

| | |
|------|---|
| HRAS | Health-Risk Attitude Scale |
| TBQ | Treatment Burden Questionnaire |
| MARS | Medication Adherence Rating Scale |
| SPSS | Statistical Package for the Social Sciences |

medication adherence, and are more likely to be intervened by the clinician as many factors are beyond the scope of a clinician in their busy schedules and are associated with financial and socio-cultural constraint. None of the studies considered the patient's perspective on attitude of health risk or burden of treatment of mental illness using standardized tools. There is some research in patients with a physical illness that suggests these variables are significantly contributory. Barfoed et al. and Alefishat et al. reported that in physical illness health risk-averse have better medication adherence [27,28] while a higher treatment burden is associated with low treatment adherence in physical illness [29,30]. Similarly, Deininger et al. and Awad et al. reported higher treatment burden is associated with low treatment adherence in physical illness [29,30]. However, it needs to be ascertained whether the same stands true for mental illness as it differs from physical illness in multiple dimension. Understanding the relationships of variables may help the physician to consider and address appropriately to improve overall patient outcomes.

To the best of our knowledge, no study has explored the relationships of the health risk attitude and treatment burden with medication adherence in patients with mental illness; hence this study was conducted to explore levels and relationships of these variables. We hypothesized that levels of medication adherence is inversely linked to the levels of treatment burden and positively linked with health risk-averse.

2. Subjects and methods

This cross-sectional study was conducted at a tertiary care center in south India from December 2016 till February 2017 after approval from the institutional ethics committee. Sample size was calculated with correlational model formula ($N = [(Z_{\alpha} + Z_{\beta})/C]^2 + 3$). Expecting of medium correlational possibility ($r = .5$) and 95% of confidence interval ($\alpha = 0.05$) with $\beta = .20$; the minimum sample size turned out to be 29. However a total of 170 consecutive participants attending the outpatient department of psychiatry on follow-up for their psychiatric illness were recruited in this study after

obtaining informed consent if they were in remission for ≥ 2 months as per the treating physician and living in the community and had a minimum of two follow-ups in the past. Exclusion criteria were a score of ≤ 35 on Symptom Questionnaire (SQ - 48) [31], diagnosis of mental retardation or dementia, history of any chronic physical illness, or inability to provide adequate information. Participants who met the study selection criteria were assessed with the following assessment tools in order.

1. Socio-demographic proforma: The proforma was designed for this study and consists of age, gender, marital status, socioeconomic status, residence, education, religion, occupational status, etc.
2. The Treatment Burden Questionnaire (TBQ): This tool measures the treatment burden without restricting its scope to a single condition or treatment context [18]. This questionnaire has 13 items scored on a Likert scale, and the scoring ranges from 0 (not a problem) to 10 (big problem), with a total score ranging from 0 to 130. It assesses the burden associated with taking medicine, self-monitoring, laboratory tests, doctor visits, need for organization, administrative tasks, following advice on diet and physical activity, and social impact of the treatment. On the reliability measure, it has a Cronbach α of .90. TBQ is a multicultural validated tool, it has been used in Indian [26].
3. Health-Risk Attitude Scale (HRAS): This tool is used to assess the attitude associated with health decisions [2]. It has 13 items, 8 items scored from 1 (agree) to 7 (disagree), while 7 items were reverse coded, with a total score that ranges from 13 to 91. A higher score indicates a more risk-averse attitude. It has been shown to have internally consistent (Cronbach $\alpha = 0.83$) and reliable (test-retest intraclass correlation coefficient = .86), with good construct and convergent validity. A translated Kannada version was used in this study as per the WHO protocol of translation and adaptation of instrument [32].
4. Medication adherence rating scale (MARS): MARS is one of the most widely used measurements of adherence [33]. It is a self-report questionnaire with ten items having dichotomy response options (yes or no), corresponding to zero (non-adherence) or one (adherence). The scale global score is obtained by summing the values of the items so that the result ranges from 0 (low probability of adherence) to 10 (high probability of adherence). It has a good internal

consistency (Cronbach $\alpha = 0, 73$) and reliability (Pearson's $r = 0, 76$; $p < 0, 05$). This tool is adopted in multiple cultures. MARS assesses both beliefs and barriers to medication adherence. A Kannada translated version of this tool has been in use in the Indian population [34].

Statistical analysis was performed using SPSS Vs 22 (Statistics for Windows, Armonk, NY, IBM Corp). Descriptive statistical analysis was used for sociodemographic and clinical characteristics. Mann–Whitney U and Kruskal–Wallis H were used to know the group differences of sociodemographic variables on the score of MARS, HRAS, and TBQ. A single linear regression analysis was calculated to predict the score of HRAS based on the score of TBQ; while a multiple linear regression was calculated to predict the score of MARS based on the score of TBQ and HRAS.

3. Results

The study sample was characterized by more participants being female, Married, Hindu, and educated (Table 1a). The mean score of age and education were 39.9 (SD \pm 13.1) and 8.24 (SD \pm 5.4) correspondingly. The mean score on MARS was 4.9 (SD \pm 1.7), while HRAS and TBQ were 62.2 (SD \pm 8.6) and 44.2 (SD \pm 23) respectively (Table 1b).

On Mann–Whitney U and Kruskal–Wallis H test, no socio-demographic variables had a statistically significant group difference on score of MARS, HRAS, and TBQ; except for education status (-Independent variable) on score of HRAS score (Dependent variable); ($U = 2.27, N_1 = 46, N_2 = 124$; $p = 0.05$; two-tailed) (Tables 2a and b).

A single linear regression was calculated to predict the score of measure on health risk attitude based on the score on the measure of treatment burden. A significant regression equation were found ($F = 94.2, df = 1, p = 001$) with R^2 of .35.

Table 1a. Demographic characteristics.

| Variables | | Frequency | Percent |
|----------------|-----------|-----------|---------|
| Gender | Male | 73 | 42.9 |
| | Female | 97 | 57.1 |
| SES | Low | 36 | 21.2 |
| | Middle | 76 | 44.7 |
| | High | 58 | 34.1 |
| Religion | Hindu | 149 | 87.6 |
| | Muslim | 14 | 8.2 |
| | Christian | 7 | 4.1 |
| Marital status | Married | 130 | 76.5 |
| | Single | 32 | 18.8 |
| | Other | 8 | 4.7 |

Table 1b. Demographic and clinical characteristics.

| Variables | Minimum | Maximum | Mean | Std. Deviation |
|------------|---------|---------|-------|----------------|
| Age | 14 | 78 | 39.99 | 13.11 |
| Education | 0 | 17 | 8.42 | 5.47 |
| MARS Score | .00 | 9.00 | 4.90 | 1.77 |
| HRAS Score | 21.00 | 55.00 | 43.18 | 8.01 |
| TBQ Score | .00 | 115.00 | 44.27 | 23.02 |

(MARS = Medication adherence rating scale, HRAS= Health risk attitude scale.

TBQ = Treatment burden questionnaire).

Participant predicted HRAS score was equal to $33.94 + .20$ (score point of TBQ). Participants' HRAS scores increase by .20 for each score point of MARS (Table 3).

Similarly, a multiple linear regression was calculated to predict the score on the measure of medication adherence based on treatment burden and health risk attitude score measure. A significant regression equation were found ($F = 97.1$, $df = 2$, $p = .001$) with R^2 of .53 (Table 4). Participants' predicted medication adherence is equal to .08. (Health risk attitude) $-.03$ (treatment burden). Participant's MARS score reduced by .03 point for each TBQ score and .08 point for each HRAS score. Both the TBQ score and HRAS score were significant predictors of the MARS score (Table 4).

3. Discussion

This study was conducted to know the levels and relationship of health risk attitude and treatment burden and medication adherence. There is hardly any study that had examined these relationships so far, and this relationship implies understanding adherence behavior that determines the outcome of a psychiatric illness.

We observed partial medication adherence in this study and is consistent with the other report from the center [34–36]. Many factors reportedly contributing partially to non-compliance such as pharmacophobic attitude, disease-associated paranormal beliefs, neglecting medication due to personal commitment, lower mental health literacy, etc. [23,37–39]. Routine intervention in clinical practice to enhance adherence is warranted.

In this study, the study population had a more of risk-averse attitude. The remission from a mental illness might have the reason behind this finding, similar to the report from western countries among the general population. Bansback et al. reported that in the general population 73.0% of Canadians were averse to health risks [6]. Byrnes et al., in their meta-analysis, found that females are more averse than male [7]. In another study, whites were more risk-averse than blacks [8]. As per Expected Utility Theory, the decision-maker chooses between risky or uncertain prospects by comparing their expected utility values [40]. Risk aversion plays a key role in examining decision making under uncertainty.

Findings revealed a moderate level of treatment burden in this study. Though there is a paucity of research on patients with mental illness in this topic, however, it is consistent with other observations among patients with medical illness [18,41]. The level of treatment burden is contributed by everything patients have to do to take care of themselves such as medication intake, drug management, self-monitoring, visits to the physician, laboratory tests, lifestyle changes, administrative tasks to access and coordinate care [14,16,42,43]. Since the duration of intervention in patients with mental illness is usually longer, such findings are expected.

Table 2a. Relationships of demographic variables with health risk attitude, treatment burden, and medication adherence.

| Variables | | N % | Mean Rank | Mann–Whitney U | Z | p |
|-----------------|------------|----------|-----------|----------------|--------|------|
| TBQ*Gender | Male | 73 42.9 | 85.58 | 3.53 | -.019 | .985 |
| | Female | 97 51.1 | 85.44 | | | |
| TBQ*Occupation | Employed | 83 48.8 | 86.90 | 3.49 | -.364 | .716 |
| | Unemployed | 87 51.2 | 84.16 | | | |
| TBQ*Education | Uneducated | 46 27.1 | 94.69 | 2.35 | -1.553 | .121 |
| | Educated | 124 72.9 | 81.48 | | | |
| HRAS*Gender | Male | 73 42.9 | 87.66 | 3.38 | -.498 | .618 |
| | Female | 97 51.1 | 83.87 | | | |
| HRAS*Occupation | Employed | 83 48.8 | 84.54 | 3.53 | -.250 | .803 |
| | Unemployed | 87 51.2 | 86.42 | | | |
| HRAS*Education | Uneducated | 46 27.1 | 98.02 | 2.27 | -2.024 | .043 |
| | Educated | 124 72.9 | 80.85 | | | |
| MARS*Gender | Male | 73 42.9 | 87.94 | 3.36 | -.569 | .569 |
| | Female | 97 51.1 | 83.66 | | | |
| MARS*Occupation | Employed | 83 48.8 | 86.92 | 3.49 | -.372 | .710 |
| | Unemployed | 87 51.2 | 84.15 | | | |
| MARS*Education | Uneducated | 46 27.1 | 81.22 | 2.65 | -.702 | .483 |
| | Educated | 124 72.9 | 87.09 | | | |

Table 2b. Relationships of demographic variables with health risk attitude, treatment burden, and medication adherence.

| Variables | | N | Mean Rank | Chi-Square | df | Asymp. Sig. |
|---------------------------|-----------|-----|-----------|------------|----|-------------|
| TBQ*Socioeconomic status | Low | 36 | 86.10 | .05 | 2 | .975 |
| | Middle | 76 | 86.12 | | | |
| | High | 58 | 84.31 | | | |
| TBQ*Marital status | Married | 130 | 87.10 | 2.81 | 2 | .245 |
| | Single | 32 | 74.50 | | | |
| | Other | 8 | 103.50 | | | |
| TBQ*Religion | Hindu | 149 | 86.18 | .90 | 2 | .636 |
| | Muslim | 14 | 86.86 | | | |
| | Christian | 7 | 68.21 | | | |
| HRAS*Socioeconomic status | Low | 36 | 88.82 | 1.14 | 2 | .563 |
| | Middle | 76 | 88.20 | | | |
| | High | 58 | 79.90 | | | |
| HRAS*Marital status | Married | 130 | 84.73 | 1.82 | 2 | .402 |
| | Single | 32 | 82.95 | | | |
| | Other | 8 | 108.19 | | | |
| HRAS*Religion | Hindu | 149 | 87.34 | 3.06 | 2 | .216 |
| | Muslim | 14 | 81.39 | | | |
| | Christian | 7 | 54.64 | | | |
| MARS*Marital status | Married | 130 | 84.13 | .52 | 2 | .771 |
| | Single | 32 | 91.03 | | | |
| | Other | 8 | 85.62 | | | |
| MARS*Socioeconomic status | Low | 36 | 81.40 | .35 | 2 | .840 |
| | Middle | 76 | 87.16 | | | |
| | High | 58 | 85.87 | | | |
| MARS*Religion | Hindu | 149 | 85.01 | .25 | 2 | .881 |
| | Muslim | 14 | 86.32 | | | |
| | Christian | 7 | 94.36 | | | |

Table 3. Relationship of treatment burden and health risk attitude.

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|------|------|
| | | B | Std. Error | | | |
| 1 | (Constant) | 33.94 | 1.07 | | 31.6 | .001 |
| | TBQ | .20 | .02 | .600 | 9.70 | .001 |

a. Dependent Variable: HRAS.

b. $R^2 = .35$, $df = 1$, $F = 94.2$, $p = 0.001$.

Table 4. Relationships of treatment burden and health risk attitude with medication adherence.

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | | | |
| 1 | (Constant) | 9.96 | .53 | | 18.66 | .001 |
| | TBQ | -.03 | .00 | -.45 | -6.86 | .001 |
| | HRAS | -.08 | .01 | -.36 | -5.59 | .001 |

a. Dependent Variable: MARS.

b. $R^2 = .53$, $df = 2$, $F = 97.1$, $p = 0.001$.

Health risk aversion was more educated than non-educated in this study. The level of education has been reported to be positively associated with risk aversion [44]. Evidence suggests that those who

achieve a higher level of educational attainment are more likely to have health risk aversion (e.g. engage in healthy behaviors and less likely to adopt unhealthy habits) [45]. There is a strong and positive correlation between education and health outcomes [46]. On the other hand, those with a lower level of education engaged in health risk-seeking behavior (e.g. smoking, drinking, less exercising, and eating an improper diet [47]. Risky behavior is (at least partly) the result of a positive attitude towards risk together with low-risk perception. Therefore, a negative relation is predicted between risk perception and risk attitude.

Health risk averse had a significant positive link with the treatment burden. Risk aversion is may accompanied by treatment burden particularly with managing medications, lifestyle changes, treatment follow-up, learning about the condition, and treatment [48]. Factors that may exacerbate the burden of treatment are - Nature, the time required, and frequency of healthcare tasks; availability of healthcare system in the locality; personal factors (patients' beliefs); situational factors (e.g. out of routine); and financial factors [49]. On other hand, risk seekers are less likely to choose more appropriate health measures and poorly adhere to treatment recommendation [27,49].

Consistent with our hypothesis, the treatment burden had a statistically significant negative link

with medication adherence. Though there are hardly any studies that examined these variables in mental illness, however, such observations have been made in physical illness [50]. Treatment burden is associated with inadequate adherence to therapeutic care; independent of illnesses [51,52]. The major source of patient's burden reported with medical illness were visits to the doctor, medical tests, treatment management, and lifestyle changes. It is speculated that a long duration of treatment results in treatment fatigue. Treatment fatigue is a waning commitment to continue with the prescribed treatment [53]. The loss of commitment can be due to many different sources. Reducing burden particularly medication and helping with medication awareness may improve adherence [54].

Contrary to our hypothesis, the health risk attitude had a negative link to medication adherence. Though there is no study available to compare this finding, however, it appears that this finding is mediated through other variables. It is likely that behavior associated with higher health risk attitude resulted in more treatment burden (As observed in this study that HRAS was positively associated with TBQ) which in turn leads to lower medication adherence.

With the findings of this study, it can be concluded that patients with mental illness in remission are health risk-averse and experience significant treatment burden that are linked with poor medication adherence. However, the findings of this study should be interpreted in the background of the limitations. The main limitations of this study were a small sample size, no control group, no detailed assessment of illness and comorbidities. Disorder specific future studies are needed to explore these relationships to overcome the shortcomings of this study.

Conflict of interest

Authors declare no conflict of interest.

Financial support

None.

Acknowledgement

The authors would like to thank Yahosha, Sharmaya, Hagai, Asther, Yasuas, Marias (Divine Retreat Centre, Chalakudy, Kerala, India), Ashish, Akash, and Mini for their support.

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