SPECIAL REPORT

# Relationship between anger, suicidal ideation and sleep disturbance in patients on haemodialysis treatment in Sheikhupura, Pakistan

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## Abstract

The cross-sectional co-relational study was conducted to identify the anger, suicidal ideation and sleep disturbance in end-stage renal failure patients having haemodialysis treatment in Punjab city of Sheikhupura, Pakistan, from March to September 2017. Data was collected using Anger Expression Scale, Suicidal Ideation Scale and Pittsburgh Sleep Quality Index along with demographic information proforma. SPSS 21 was used for data analysis.Of the70 patients, 38(54.3%) were males and 32(45.7%) were females. The patients had significant positive relationship between suicidal ideation and sleep disturbance ($p<0.05$), while sleep disturbance ($p<0.001$) emerged as a positive predictor of suicidal ideation. Significant positive correlation between anger inward and suicidal ideation ($p<0.05$) was found ($p<.05$). There were non-significant mean differences between the various age groups on the scores of anger, sleep disturbance and suicidal ideation ($p>0.05$ each). There was a significant positive association between sleep disturbance and suicidal ideation.

**Keywords:** Dialysis treatment, Anger, Suicidal ideation, Sleep disturbance.

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## Introduction

Chronic kidney disease (CKD) is a global health burden and can occur at any age.[1] The number of CKD patients is increasing over the world.[2] In the United Kingdom the annual CKD prevalence is about 100 per 1,000,000 people.[3] In European countries, the corresponding number is about 135/1,000,000, and in the United States, it is 336/1,000,000 population.[4] CKD is highly prevalent in India and Pakistan compared to the developed countries.[5] In 2013, India had an estimated prevalence of end-stage renal disease (ESRD) of 229 per million population annually.[6] CKD is also known as end-stage renal failure (ESRF) because in the final stage of CKD, the kidney stops working nearly altogether.[7] In the last stage of ESRF, the kidney has diminished its ability to filter blood, and the wastes add up in the body which makes normal body functions impossible. At this point, in order to maintain the kidney function, the individual needs to have regular dialysis treatment.[8] The patients having regular haemodialysis treatment face physical as well as psychological challenges in their lives.[9] The patient's psychological life is influenced by social, family support system and the patient's own personality characteristics.[10] In order to cope with the challenges accrued due to regular dialysis treatment, the patients use defence mechanism, mainly denial, and develop other psychiatric problems as well as well as disturbances in interpersonal relationships.[11] The patients have restrictions and limitations in their lives i.e. repeated hospitalisations, limited fluid intake, limited bodily actions, economic concerns, and reliance on family even for basic needs of life. Because of all of these concerns, patients consider themselves a burden on their families and society. They experience frustration and anger due to all the complications resulting from their disease. They also experience hopelessness about their lives and recovery from illness due to long-term and poor prognosis of the disease. All these factors influence the patients' quality of life and their psychological health is impaired. As a result, haemodialysis patients may feel anger, suicidal ideation and sleep disturbances.[12-15] The current study was planned to determine the relationship between anger, suicidal ideation and sleep disturbance in haemodialysis patients.

## Patients and Methods

The cross-sectional co-relational study was conducted at a dialysis facility in the Punjab city of Sheikhupura, Pakistan, from March to September 2017, and comprised patients on dialysis who were recruited through purposive sampling technique.

Those included had been taking dialysis treatment for at least 3 months and not more than 3 years. Those with history of psychiatric illnesses were excluded, and so were CKD patients who were not on dialysis.

For data collection, a self-generated demographic

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questionnaire was employed to gather personal information about the subjects. Demographic sheet included questions related to participants' age, gender, education, marital status, and duration of dialysis treatment.

Also used was the Anger Expression Scale (AES), an indigenous tool developed in 2016, to measure anger. It contains 23 items with a 5-point rating scale" 0 = not at all; 1 = rarely; 2 = sometimes; 3 = often; and 4 = always. AES measured the expression of anger on the basis of three factors i.e. anger outward 7 items, anger inward 9 items, and anger control 7 items. Scale had a Chronbach's reliability of $\alpha$=0.69 which is significant and indicates high internal consistency and reliability. The concurrent validity of the scale was 0.429, indicating that the scale was reliable and valid for the targeted population.[16]

Suicidal ideation was measured with the Urdu version of Suicidal Ideation Scale (SIS) validated in 2013.[17] It consists of 10 items with a 5-point rating scale: 0 = not at all; 1 = rarely; 2 = sometimes; 3 = often; and 4 -always. The SIS affective domain has 6 items and the behavioural domain has 4. The Chronbach's alpha of the Urdu version was $\alpha$=0.77. The test retest reliability of Urdu version of suicidal ideation scale was 0.89 ($p<0.001$).

For the assessment of sleep quality, the Urdu version of Pittsburgh Sleep Quality Index (PSQI-U)[18] was used. It is a self-directed tool for the measurement of sleep quality of individuals over the preceding month. It assesses sleep on seven clinical areas: sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications, and daytime dysfunction. It had test retest reliability of 0.70 ($p<0.01$) for the Urdu version which is significantly high. The composite score of PSQI-U at baseline and the composite score of the PSQI-E at the 4-week interval were highly correlated with each other and indicated good linguistic inter-changeability (r=0.74). The Cronbach's alpha for PSQI-U was $\alpha$=0.56.

Permission was obtained from the institutional ethics committee, and informed consent was taken from all the subjects. AES, SIS and PSQI-U were administered individually on patients. Participants were explained about the rating scale to which they had to respond on each item of the scales and the researcher filled the relevant column.

Data was analysed using SPSS 21. Pearson product moment correlation was carried out to find out the relationship between anger, suicidal ideation and sleep disturbance in haemodialysis patients. Gender differences in sleep disturbance were compared by using t test. Cohen's d was also mentioned in the result which is one of the common ways to measure effect size. In the comparison of gender difference in sleep disturbance, the confidence interval (CI) of the mean difference of both genders' sleep quality was also mentioned. The CI shows the degree of confidence in the results. The CI has upper and lower limits because we were not in a position to give specific points at which one could trust the inferences.

## Results

Of the 70 patients, 38(54.3%) were males and 32(45.7%) were females. The overall mean age was 49.27±11.79 years (range: 30-65 years).

There was a significant positive association between sleep disturbance and suicidal ideation ($p<0.05$). Suicidal ideation was also significantly associated with objective sleep quality ($p<0.05$), use of sleep medication ($p<0.01$)

**Table-1:** Pearson Product Moment Correlation between Suicidal Ideation and Sleep Disturbance (n=70).

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Suicidal ideation | - | 0.983** | 0.850** | 0.289* | 0.271* | 0.190 | 0.093 | 0.168 | 0.204 | 0.428** | 0.385** |
| 2. Affective suicide | | - | 0.739** | 0.292* | 0.283* | 0.209 | 0.097 | 0.163 | 0.193 | 0.404** | 0.384** |
| 3. Behavioural suicide | | | - | 0.258* | 0.184 | 0.100 | 0.062 | 0.149 | 0.197 | 0.401** | 0.310** |
| 4. Global sleep | | | | - | 0.801** | 0.769** | 0.807** | -0.175 | 0.610** | 0.462** | 0.668** |
| 5. Objective sleep quality | | | | | - | 0.470** | 0.568** | -0.141 | 0.369** | 0.265* | 0.592** |
| 6. Sleep latency | | | | | | - | 0.600** | -0.111 | 0.401** | 0.250* | 0.366** |
| 7. Sleep duration | | | | | | | - | -0.364** | 0.518** | 0.289* | 0.302* |
| 8. Habitual sleep efficiency | | | | | | | | - | -0.059 | 0.-346** | 0.118 |
| 9. Sleep disturbance | | | | | | | | | - | 0.118 | 0.312** |
| 10.Use of sleep medication | | | | | | | | | | - | 0.131 |
| 11.Daytime dysfunction | | | | | | | | - | | | |
| Mean±SD | 7.19±8.09 | 6.06±6.31 | 1.13±2.21 | 11.76±4.31 | 1.76±1.06 | 1.94±1.15 | 1.93±1.35 | 2.97±2.39 | 1.69±6.49 | 0.44±.89 | 1.04±1.06 |

Note: **p < .01,*p < .05, SD=standard deviation

**Table-2:** Pearson Product Moment Correlation between Anger and Suicidal Ideation.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1. Anger | - | 0.543** | 0.563** | 0.459** | 0.142 | 0.175 | 0.021 |
| 2. Outward anger | | - | -0.213 | -0.212 | 0.012 | 0.054 | -0.111 |
| 3. Inward anger | | | - | 0.215 | 0.268* | 0.277* | 0.189 |
| 4. Anger control | | | | - | -0.070** | -0.083 | -0.020 |
| 5. Suicidal ideation | | | | | - | 0.983** | 0.850** |
| 6. Affective suicide | | | | | | - | 0.739** |
| 7. Behavior suicide | | | | | | | - |
| M | 30.83 | 11.46 | 11.13 | 8.24 | 7.19 | 6.06 | 1.13 |
| SD | 9.27 | 7.23 | 5.78 | 4.55 | 8.09 | 6.31 | 2.21 |

Note: **p < .01. *p < .05, M=mean, SD=standard deviation.

**Table-3:** Mean, Standard Deviation, and t Values on sleep disturbance among Male and Female patients (n=70).

| | Male (n=38) | Female (n=32) | | | CI | | Cohen's *d* |
|---|---|---|---|---|---|---|---|
| **Variable** | **Mean±SD** | **Mean±SD** | **t** | **p** | **LL** | **UL** | |
| Sleep Disturbance | 11.87±4.43 | 22.66±10.24 | 0.203 | 0.04 | 1.87 | 2.29 | 0.04 |

Note: SD=standard deviation; CI: Confidence interval.

and daytime dysfunction (p<0.05). Sleep disturbance was a positive predictor of suicidal ideation and disturbed sleep patterns led to suicidal ideation in haemodialysis patients. There was no significant association between suicidal ideation and sleep latency (p>0.05) and between suicidal ideation and habitual sleep efficiency (p>0.05) (Table 1).

There was a significant positive association between inward anger and suicidal ideation (p<0.05) but no significant association was found between outward anger and suicidal ideation (p>0.05) (Table 2). There was a significant gender difference in scores of sleep disturbance. The female patients in the sample had more disturbed sleep compared to male participants (p=0.04 (Table 3).

## Discussion

ESRD is globally rising in figures condition, especially in developing countries, that could cause severe pressure on patients' lives as well as on society.[19] The most common treatment of ESRD is haemodialysis therapy that can have an impact on patients' social, physical, psychological and economic life.[20] The current study was planned to evaluate the psychological concerns the haemodialysis patient's i.e. anger, suicidal ideation and sleep disturbance, as well as to identify the association between these variables. The findings revealed a significant positive association between sleep disturbance and suicidal ideation. The subjects had troubled sleep due to breathing problem, fatigue due to their disease and dialysis schedule, and stress about multiple problems they were facing due to their illness. Having troubled sleep was a strong predictor of suicidal ideation. The patients felt more irritability due to lack of sleep and difficulty in initiating and maintaining sleep, aggressiveness, hopelessness and the urge to find escape from such a burdened life that could lead to suicidal ideation. These findings are in line with a previous study on haemodialysis patients which showed that there was positive association between sleep disturbance and suicidal ideation in patients and in many cases this association was far from depression.[21] Another study showed that sleep disturbance was a remarkable predictor of suicidal ideation among adults.[20] Results also showed findings consistent with literature that inward anger was positively correlated with suicidal ideation in haemodialysis patients.[22] The patients who directed their anger inwardly rather than expressing it on external environment also had tendencies of suicidal ideation. A previous study showed that inhibition to aggression was associated with self-aggression and this eventually led to suicidal ideation or suicidal behaviour.[23] The findings of the present study also suggest that female patients had high rates of sleep disturbance than male patients. The female patients included in the present study reported more stressful conditions than male patients that might have affected their sleep patterns compared to the male patients. Most of the female patients reported high level of stress due to thoughts about the life of their children, especially daughters, if their mother was to be no more. These findings are consistent with a study on dialysis patients which showed that females had poor quality of sleep than males. The high prevalence of sleep disturbance in females than the males was due to high prevalence of anxiety disorders and depression in females.[24] The results showed no significant association between the age of the haemodialysis patients and in scores of anger, suicidal ideation and sleep disturbance. These findings are incongruent with previous studies that showed sleep disturbance and suicidal ideation to be positively associated with patients' age.[25] It was also found that duration of disease, age and economic status had an impact on patients' psychological symptoms of depression and anxiety, frustration, sleep quality and fatigue.[26] The cause of these inconsistent outcome with the previous studies might be slight age diversity of the sample because most of the participants in the sample were between ages 30-50 years and a few who were aged 51-65 years. This

may have resulted in dissimilar findings.

The limitations of the study is its less diverse and small sample which was due to short time span and because of the refusal of some subjects to take part in the study due to their irritability. This means the findings cannot be generalised. Also, the unequal number of males and females in the sample may have affected the link of gender difference with other study variables.

## Conclusion

Suicidal ideation was found to be positively linked with sleep disturbance in haemodialysis patients. There was also a positive association between inward anger and suicidal ideation. Sleep disturbance was more common in female patients than in male patients. Finally, age had no association with sleep disturbance, anger and suicidal ideation in haemodialysis patients.

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