Quality of Life and Illness Acceptance among End-Stage Renal Disease (ESRD) Patients on Hemodialysis: The Moderating Effect of Death Anxiety during COVID-19 pandemic

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Abstract
The purpose of the study was to examine the quality of life and illness acceptance among ESRD patients with the moderating effects of death anxiety. The cross-sectional design was incorporated. The sample was comprised of 240 participants. Individuals with ESRD on hemodialysis were approached above 20 years of age. A self-administered questionnaire was used for data collection. The results revealed that COVID-19 has a significant impact on the quality of life of patients and their illness acceptance. Covid-19 affected the general health of patients, their psychological health, as well as their social relationships. The results also confirmed that death anxiety negatively moderates the relationship between quality of life and illness acceptance among ESRD patients. This study will shed light on the need to provide appropriate

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psychosocial care as well as supportive therapies to people with end-stage renal disease who are experiencing mental distress during and after the COVID-19 outbreak.

Keywords
end-stage renal disease, Covid-19, death anxiety, quality of life, psychological distress

Introduction

In late 2019, a new acute respiratory disease named Corona virus, commonly known as COVID-19, spread around the globe and became an outbreak. That is why it was declared a pandemic by the World Health Organization (World Health Organization, 2019). COVID-19 pandemic situations always have a negative impact on the mental health and well-being of people (Pfefferbaum & North, 2020). The COVID-19 pandemic has badly affected education (Mushtaque, Rizwan, 2021), health, labor, and even every segment of life. Hospitals are places that are at high risk of COVID-19 virus circulation because they are places that all of us visit and where every sick person can easily approach. Some people who are suffering from chronic diseases need to visit the hospital for their care. Health professionals are at high risk of disease contamination and are part of the COVID-19 epidemic. The World Health Organization has recommended reducing elective health operations (dental, skin, ENT) (Moraes et al., 2020). COVID-19 affected the public health system adversely, and all the elective departments of the health system reduced their activities to avoid disease spread and contamination of health staff (Mushtaque, Rizwan, 2021) and the general public (Chisini et al., 2020).

End-Stage Renal Disease (ESRD) or Chronic Renal Failure is a stage of chronic kidney disease (CKD) that occurs when the kidneys lose function and the disease progresses to an advanced stage, at which point dialysis or a renal transplant is required to stay alive (“Chapter 1: Definition and classification of CKD,” 2013). ESRD was recently included in the group of lifestyle diseases of the 21st century. It is a progressive and often irreversible disease. According to studies, ESRD affects approximately 600 million people worldwide, accounting for 6–15% of the global population. The number of peritoneal and hemodialysis patients is expected to increase to 5.5 million by 2030 (Eckardt et al., 2009). Studies based on health screening camps and communities in Pakistan show that the prevalence of CKD in Pakistan is 16.6%–25%. (Saleem et al., 2015). A study on the Pakistan Renal Data System (PKRDS) in 2020 revealed that in Pakistan there are a total of 31 hemodialysis units and 658 machines, 440 of which are for hepatitis-ve, 190 for hepatitis C-ve, and 27 machines for hepatitis B-ve. In this study, samples were collected from a total of 990 patients. They also analyzed the causes of ESRD and concluded that out of 990 total patients, 327 were suffering from diabetic nephropathy, 317 with hypertension, 71 with glomerulonephritis, 31 with stones, 2 from polycystic kidney disease, and 105 from other causes. The hepatitis
status of the ESRD patients also showed that there were 437 hepatitis C +ve and 531 anti-HCV-ve patients, while 22 were unknown and 302 were HCV PCR +ve. The Hepatitis B status indicates that there were 14 HBsAg +ve and 877 were HBsAg-ve, while the 99 others were unknown. In Pakistan, they explored the gender disparity of 35% of females and 65% of males suffering from ESRD (Ahmad & Javed, 2021).

Illness acceptance plays a vital role in chronic disease treatment, which is necessary for the better quality of life of patients. Therefore, psychosocial support is critical, as patients with ESRD face many restrictions, such as dietary, physical, and social, while on dialysis. As a result, psychological and social care are important for the acceptance of illness and quality of life (Jankowska-Polaska et al., 2016). A higher level of disease acceptance was shown among transplant patients than among dialysis patients, which is related to their demographic characteristics. As the patient recognizes the disease, they are more likely to exhibit appropriate disease-related behavior (Chan, 2012). End-Stage Renal Disease development and progression is a significant cause of premature mortality and reduced quality of life (Benjamin & Lappin, 2021). Acceptance of illness leads to a higher quality of life for patients suffering from chronic disease (Zahra et al., 2020). A low level of quality of life in ESRD patients is associated with disease complications and psychological issues (Dbrowska-Bender et al., 2018).

ESRD is critical and fatalities are associated with comorbidities such as cardiovascular diseases, hypertension, diabetes mellitus, and psychological disorders. ESRD is a serious and progressive disease that needs long-term treatment and, as its name indicates, is end-stage renal disease, so it has a negative effect on the people who are suffering from it. People who have a chronic disease are more likely to be diagnosed with psychological problems, as are people with chronic kidney disease, who are prone to being diagnosed with psychological disorders (Goh & Griva, 2018).

Another concomitant concern among ESRD patients is anxiety. Many studies have shown that ESRD patients have a significant level of anxiety. According to a previous study, the prevalence of anxiety related to ESRD was estimated at around 13%–52% (Pretto et al., 2020). Another study identified a positive, significant correlation between depression and anxiety with the performance status of ESRD patients (Rajan, E. J. E., & Subramanian, S. (2016). Patients with ESRD face physical, psychological, and spiritual complications as well as lower quality of life that decrease their survival rates and increase thoughts about death, which cause death anxiety (Cohen et al., 2016).

The coronavirus disease 2019 (COVID-19) has the potential to impair hemodialysis patients with ESRD’s mental and social well-being. In a study, more than 85% of participants were apprehensive about receiving dialysis treatments due to the risk of infection from close contact at the dialysis facility or during transportation. Thirty percent of people have reported extreme stress and thoughts of death, and 85% report feeling overwhelmed by COVID-19 problems (Gansevoort & Hilbrands, 2020; Lee et al., 2020). Kidney involvement, as demonstrated by hematuria and proteinuria, was found to be an independent predictor of in-hospital death (Docherty et al., 2020). The higher frequency of acute kidney injury and mortality due to renal-related
complications documented in observational studies could be explained in part by SARS-CoV-2 kidney tropism and systemic immune responses to the virus (Cheng et al., 2020).

In order to fill the gap, as death anxiety has taken a terrible toll on our society globally for a variety of reasons, during the pandemic the prevalence of death anxiety among chronically ill patients is very new and not well documented at all. The purpose of the present research was to examine the quality of life and illness acceptance among end-stage renal disease patients on hemodialysis and the moderating role of death anxiety during lockdown.

**Hypothesis of the Study**

H1. There is likely to be a significant association between quality of life, illness acceptance among end-stage renal disease patients

H2. There is likely to be death anxiety negatively moderates the relationship between quality of life, illness acceptance among end-stage renal disease patients

**Material and Method of the Study**

**Sample, Data Collection, and Design**

The data was gathered using the purposive sampling technique and self-administered questionnaires. G Power was used to calculate the sample size (Services Hospital, Mayo Hospital, General Hospital Dialysis Center, and Govt. Said Mitha Teaching Hospital in Lahore, Pakistan). The current study’s sample was collected from the anonymized kidney and dialysis unit. The study included 240 people, ranging in age from 20 to 85. The following criteria apply to the cross-sectional study: Patients with end-stage renal illness who underwent dialysis on a regular basis at the hospital during COVID-19 and who had received at least 2 years of hemodialysis treatment had no significant comorbidities (e.g., cancer) and a diagnosis of depression with cognitive dysfunction.

**Instruments**

The instruments include a socio-demographic form for each participant. All the scales used in the current study were in Urdu, the national language of Pakistan. So that the respondent can easily understand the statements and provide a reliable response.

Felton & Revenson (1984) developed the Illness Acceptance Scale. This scale allows the researcher to assess the patient’s level of acceptance of any illness. It consists of eight assertions about the negative aspects of inadequate well-being. It’s a 5-point Likert scale, with responses ranging from 1 to 5, with 1 being weak and 5 being extremely strong. Zahra et al. translated the Urdu-adapted version of the Illness acceptance scale (2019) that was used in the current study. Cronbach’s alpha value of the
illness acceptance scale is 0.950. The score range of the illness acceptance scale is (8–40), whereas, value (8–18) considered as lack of illness acceptance, value (19–29) considered as moderate, and value (30–40) considered as high level of illness acceptance.

Quality of Life (WHOQOL-BREF) questionnaire—Urdu, translated by Saqib Lodhi et al. (2017). It is a 26-item scale. The Urdu version of the World Health Organization’s quality of life questionnaire (WHOQOL-BREF) scale has excellent psychometric characteristics. As a result, it can be used to assess the quality of life among Pakistanis as a valid technique. In the current study, the Cronbach’s alpha value of the quality of life scale is 0.921.

The Death Anxiety Scale-Urdu (DAS-U) is reliable and valid. The Death Anxiety Questionnaire is a 15-item self-report measure used with a population recruited against a life-threatening illness. The score range of the scale is (15–75), whereas value (15–35) considered as low death anxiety, value (36–55) considered as moderate, and value (56–75) considered as high level of death anxiety. It is a five-point Likert scale. The Cronbach’s alpha value of the death anxiety scale is 0.970. (Saleem et al., 2015).

Procedure

In this study, we looked at the data from 240 patients with end-stage renal illness. For this purpose, we approached the four different hospital dialysis wards anonymized. Participants first read the study’s purpose and gave informed consent before moving on to the next page, which contained the questionnaire. The demographics, illness acceptance scale, quality of life, and death anxiety scale are all included in the questionnaire. All instruments were reviewed for the accuracy of the researcher’s written information before data entry and coding. All the data was entered into a spreadsheet for statistical reasons after following the instructions and data coding. To avoid data input errors and other potential blunders, all data was imported into SPSS. 50 people were ruled out due to missing information and inadequate response.

Ethical Approval

The ethical approval was taken from the research and ethical review committee of anonymized.

Statistical Analysis

The demographic data was subjected to descriptive analysis, whereas the study variables were examined using PLS-SEM.
Result of the Study

The (Table 1) depicts the demographic features of the study participants, who were 58% male and 41% female. The majority of participants are between the ages of 56 and 65 and come from the middle and lower classes. The data were collected during the COVID-19 period, when patients were required to attend during a critical period since they did not receive treatment at home. Which revealed that 50% of respondents had been hospitalized during the duration of COVID-19. Patients with ESDR reported comorbidities such as hepatitis, hypertension, and diabetes; only 17% of patients

### Table 1. Demographic characteristics of the ESDR Patients included in the study (240).

| Demographic Variables                        | f(%)       |
|---------------------------------------------|------------|
| Gender                                      |            |
| Male                                        | 141(58.8)  |
| Female                                      | 99(41.3)   |
| Age of the participant                      |            |
| 25–35                                       | 44(18.3)   |
| 36–45                                       | 63(26.3)   |
| 46–55                                       | 45(18.8)   |
| 56–65                                       | 74(30.8)   |
| 66–75                                       | 14(5.8)    |
| Qualification of the participant            |            |
| Vocational education                        | 42(17.5)   |
| High school                                 | 131(54.6)  |
| College/University                          | 10(4.2)    |
| Uneducated                                  | 57(23.8)   |
| Socioeconomic status                        |            |
| Upper                                       | 3(1.3)     |
| Middle                                      | 67(27.9)   |
| Lower                                       | 170(70.8)  |
| Any other disease with ESDR                 |            |
| Diabetes                                    | 80(33.3)   |
| Hepatitis                                   | 70(29.2)   |
| High blood pressure                         | 47(19.6)   |
| No disease                                  | 43(17.9)   |
| Any other mental illness with ESDR          |            |
| Yes                                         | 10(4.1)    |
| No                                          | 230(95.8)  |
| Insomnia                                    | 193(80.4)  |
| Muscle cramp                                | 190(80.0)  |
| Fatigue                                     | 232(97.3)  |
| Hospitalization during the period of COVID-19| 122(50.8) |

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**OMEGA—Journal of Death and Dying 89(2)**
reported no comorbidity with ESDR, and 4% reported psychological comorbidity with ESDR.

Assessment of Measurement Model

The present study incorporated structural equation modeling (SEM) technique using Smart PLS 3.2.6 to examine the measurement model. There are two steps of measurement model: convergent validity and discriminant validity. Measurement model with its features were exhibited in the Figure 2.

The present study examined convergent validity with three steps, namely; individual item reliability, internal consistency reliability, and average variance extracted (AVE) (Table 2). The factor loading of every construct is known as individual item reliability (Hair et al., 2016.; Hulland, 1999). Each item of a construct has a different and unique factor loading. The loading of a construct above 0.30 can be retained in the model as the minimum acceptable loading value of a construct is 0.30 (Hair et al. 2016). Hair et al. (2016) stated that items of the construct must be removed if the removal helps in increasing the value of AVE and composite reliability (CR). Hence, the current study did not report any removal of items as the removal of items failed to increase the value of AVE and CR. In addition, the second step for the assessment of convergent validity is internal consistency reliability. The internal consistency reliability can be examined by the CR of the construct. According to previous studies, Cronbach’s alpha and CR are appropriate for the successful examination of internal consistency reliability (Hair et al., 2014). The value of CR must be above than 0.70 (Hair et al., 2017). By following the recommendations of Hair et al. (2017), each item of the present study exhibited the value above than 0.70. In the third step, the study determined AVE to examine convergent validity. In order to evaluate the perfect convergent validity, the value of AVE must be greater than 0.50 (Fernandes, 2012; Hair et al., 2014). The convergent

![Figure 1. Conceptual framework of the study.](image)
validity of the present study is accurate as every construct represented the value of AVE above than 0.50.

The second step in measurement model is the assessment of discriminant validity. Discriminant validity determines the degree of variance among the constructs (Hair et al., 2010). Discriminant validity is examined through Fornell-Larcker’s (1981) criteria, cross-loadings, and heterotrait-monotrait ratio (HTMT). Firstly, in Fornell-Larcker’s (1981), the first value of every construct must be bold. The diagonal value of discriminant validity shows the square root of AVE. The discriminant validity is considered valid if the diagonal values are greater than non-diagonal values in respected rows and columns. Table 3 denotes the acceptance values of discriminant validity and illustrates that all values are in acceptable range. Secondly, cross-loadings are another criteria for the assessment of discriminant validity (Grégoire & Fisher, 2006). The cross-loadings of each construct must be greater than the cross-loadings with other constructs. Table 4 exhibits the acceptable cross-loadings of the constructs. Thirdly, heterotrait-monotrait ratio (HTMT) is another criteria to measure discriminant validity (Henseler et al., 2015). HTMT is a factor correlation which differentiate among constructs (Henseler et al., 2016). Table 5 represents the HTMT value of the constructs.
Table 2. Loadings, Composite Reliability, and Average Variance Extracted.

| Constructs       | Items | Loadings | AVE  | CR   |
|------------------|-------|----------|------|------|
| Death anxiety    | DA1   | 0.812    | 0.709| 0.973|
|                  | DA2   | 0.874    |      |      |
|                  | DA3   | 0.909    |      |      |
|                  | DA4   | 0.894    |      |      |
|                  | DA5   | 0.861    |      |      |
|                  | DA6   | 0.823    |      |      |
|                  | DA7   | 0.850    |      |      |
|                  | DA8   | 0.811    |      |      |
|                  | DA9   | 0.840    |      |      |
|                  | DA10  | 0.830    |      |      |
|                  | DA11  | 0.866    |      |      |
|                  | DA12  | 0.851    |      |      |
|                  | DA13  | 0.842    |      |      |
|                  | DA14  | 0.793    |      |      |
|                  | DA15  | 0.766    |      |      |
| Environment      | EN1   | 0.759    | 0.736| 0.957|
|                  | EN2   | 0.864    |      |      |
|                  | EN3   | 0.876    |      |      |
|                  | EN4   | 0.858    |      |      |
|                  | EN5   | 0.827    |      |      |
|                  | EN6   | 0.856    |      |      |
|                  | EN7   | 0.914    |      |      |
|                  | EN8   | 0.902    |      |      |
| General health   | GH1   | 0.914    | 0.865| 0.928|
|                  | GH2   | 0.946    |      |      |
| Illness acceptance| IA1  | 0.820    | 0.794| 0.969|
|                  | IA2   | 0.904    |      |      |
|                  | IA3   | 0.927    |      |      |
|                  | IA4   | 0.904    |      |      |
|                  | IA5   | 0.853    |      |      |
|                  | IA6   | 0.905    |      |      |
|                  | IA7   | 0.909    |      |      |
|                  | IA8   | 0.901    |      |      |
| Physical health  | PH1   | 0.799    | 0.739| 0.952|
|                  | PH2   | 0.854    |      |      |
|                  | PH3   | 0.908    |      |      |
|                  | PH4   | 0.851    |      |      |
|                  | PH5   | 0.830    |      |      |
|                  | PH6   | 0.895    |      |      |

(continued)
Assessment of Structural Model

The next step of the SEM is the structural model also known as inner model. The relationship among the constructs can be determined by structural model. Bootstrap technique of SEM provides the results for the structural model. The current study determined quality of life as a second order construct. Figure 3 depicts the assessment of the structural model.

Table 2. (continued)

| Constructs          | Items | Loadings | AVE  | CR   |
|---------------------|-------|----------|------|------|
| Psychological       | PH7   | 0.872    |      |      |
|                     | PS1   | 0.820    | 0.719| 0.939|
|                     | PS2   | 0.893    |      |      |
|                     | PS3   | 0.891    |      |      |
|                     | PS4   | 0.817    |      |      |
|                     | PS5   | 0.813    |      |      |
|                     | PS6   | 0.848    |      |      |
| Social relationships| SR1   | 0.862    | 0.762| 0.906|
|                     | SR2   | 0.884    |      |      |
|                     | SR3   | 0.874    |      |      |

Note. AVE = average variance extracted, CR = composite reliability.

Table 3. Latent Variable Correlations and Square Roots of Average Variance Extracted (AVE).

|      | DA  | EN  | GH  | IA  | PH  | PS  | SR  |
|------|-----|-----|-----|-----|-----|-----|-----|
| DA   | 0.842 |    |     |     |     |     |     |
| EN   | 0.587 | 0.858 |    |     |     |     |     |
| GH   | 0.423 | 0.537 | 0.930 |    |     |     |     |
| IA   | 0.778 | 0.436 | 0.504 | 0.891 |    |     |     |
| PH   | 0.523 | 0.530 | 0.356 | 0.655 | 0.859 |    |     |
| PS   | 0.547 | 0.517 | 0.310 | 0.671 | 0.745 | 0.848 |    |
| SR   | 0.492 | 0.502 | 0.446 | 0.532 | 0.522 | 0.533 | 0.873 |

Note. Entries in the boldface represent the square root of average variance extracted (AVE) DA = Death Anxiety, IA, Illness Acceptance, EN = Environment, GH = General health, PH = Physical Health, PS = Psychological Health, SR = Social Relationship.

Assessment of Structural Model

The next step of the SEM is the structural model also known as inner model. The relationship among the constructs can be determined by structural model. Bootstrap technique of SEM provides the results for the structural model. The current study determined quality of life as a second order construct. Figure 3 depicts the assessment of the structural model.

The inner model shows the path coefficients of the hypothesized relationships of the study. Hypothesis H1 predicted that there is a significant relationship between quality of life and illness acceptance. The outcomes represented in Figure 3 and Table 6 indicate that there is a significant relationship between quality of life and illness acceptance ($\beta = 0.247; t = 5.594; p < 0.000$). Similarly, hypothesis H2 stated that death anxiety negatively moderates the relationship between quality of life and illness acceptance. The interaction effect in Figure 3 and Table 6 depicts that death anxiety negatively
### Table 4. Cross-Loadings.

|     | DA    | EN    | GH    | IA    | PH    | PS    | SR    |
|-----|-------|-------|-------|-------|-------|-------|-------|
| DA1 | 0.812 | 0.524 | 0.454 | 0.778 | 0.521 | 0.532 | 0.523 |
| DA2 | 0.874 | 0.531 | 0.433 | 0.818 | 0.556 | 0.578 | 0.531 |
| DA3 | 0.909 | 0.547 | 0.367 | 0.754 | 0.518 | 0.547 | 0.485 |
| DA4 | 0.894 | 0.543 | 0.290 | 0.716 | 0.527 | 0.566 | 0.495 |
| DA5 | 0.861 | 0.477 | 0.295 | 0.575 | 0.371 | 0.380 | 0.389 |
| DA6 | 0.823 | 0.495 | 0.451 | 0.655 | 0.450 | 0.471 | 0.448 |
| DA7 | 0.850 | 0.443 | 0.345 | 0.651 | 0.409 | 0.424 | 0.432 |
| DA8 | 0.811 | 0.528 | 0.337 | 0.591 | 0.446 | 0.460 | 0.415 |
| DA9 | 0.840 | 0.445 | 0.252 | 0.609 | 0.402 | 0.439 | 0.348 |
| DA10| 0.830 | 0.505 | 0.279 | 0.577 | 0.404 | 0.408 | 0.386 |
| DA11| 0.866 | 0.460 | 0.326 | 0.626 | 0.405 | 0.430 | 0.324 |
| DA12| 0.851 | 0.472 | 0.403 | 0.628 | 0.357 | 0.381 | 0.389 |
| DA13| 0.842 | 0.521 | 0.349 | 0.617 | 0.425 | 0.455 | 0.386 |
| DA14| 0.793 | 0.498 | 0.381 | 0.594 | 0.374 | 0.411 | 0.267 |
| DA15| 0.766 | 0.390 | 0.341 | 0.502 | 0.346 | 0.326 | 0.273 |
| EN1 | 0.429 | 0.759 | 0.454 | 0.320 | 0.406 | 0.384 | 0.457 |
| EN2 | 0.490 | 0.864 | 0.554 | 0.390 | 0.421 | 0.414 | 0.557 |
| EN3 | 0.499 | 0.876 | 0.462 | 0.392 | 0.502 | 0.491 | 0.429 |
| EN4 | 0.441 | 0.858 | 0.391 | 0.365 | 0.471 | 0.456 | 0.397 |
| EN5 | 0.519 | 0.827 | 0.317 | 0.294 | 0.455 | 0.445 | 0.296 |
| EN6 | 0.468 | 0.856 | 0.542 | 0.447 | 0.455 | 0.456 | 0.510 |
| EN7 | 0.572 | 0.914 | 0.485 | 0.391 | 0.470 | 0.459 | 0.398 |
| EN8 | 0.605 | 0.902 | 0.469 | 0.381 | 0.451 | 0.440 | 0.396 |
| GH1 | 0.376 | 0.433 | 0.914 | 0.452 | 0.263 | 0.227 | 0.449 |
| GH2 | 0.409 | 0.553 | 0.946 | 0.483 | 0.386 | 0.338 | 0.389 |
| IA1 | 0.586 | 0.264 | 0.495 | 0.820 | 0.503 | 0.521 | 0.366 |
| IA2 | 0.701 | 0.381 | 0.454 | 0.904 | 0.565 | 0.584 | 0.484 |
| IA3 | 0.764 | 0.449 | 0.518 | 0.927 | 0.602 | 0.608 | 0.508 |
| IA4 | 0.686 | 0.375 | 0.372 | 0.904 | 0.620 | 0.632 | 0.427 |
| IA5 | 0.641 | 0.393 | 0.313 | 0.853 | 0.626 | 0.644 | 0.427 |
| IA6 | 0.682 | 0.360 | 0.495 | 0.905 | 0.565 | 0.582 | 0.518 |
| IA7 | 0.748 | 0.418 | 0.486 | 0.909 | 0.579 | 0.598 | 0.549 |
| IA8 | 0.716 | 0.442 | 0.456 | 0.901 | 0.602 | 0.610 | 0.491 |
| PH1 | 0.388 | 0.346 | 0.285 | 0.504 | 0.799 | 0.747 | 0.331 |
| PH2 | 0.441 | 0.479 | 0.355 | 0.565 | 0.854 | 0.800 | 0.375 |
| PH3 | 0.501 | 0.453 | 0.241 | 0.596 | 0.908 | 0.869 | 0.469 |
| PH4 | 0.524 | 0.469 | 0.166 | 0.567 | 0.851 | 0.812 | 0.449 |
| PH5 | 0.519 | 0.432 | 0.408 | 0.658 | 0.830 | 0.739 | 0.527 |
| PH6 | 0.434 | 0.456 | 0.342 | 0.589 | 0.895 | 0.857 | 0.450 |

(continued)
moderates the relationship between quality of life and illness acceptance ($\beta = -0.265; t = 5.955; p < 0.000$).

The interaction effect is presented in the Figure 4. Exogenous construct is shown on x-axis and endogenous construct is shown on y-axis. The simple slope plot represents the relationship between independent and dependent variable for high and low level of moderator by three lines (green, red, and blue). Green and blue lines emphasize the low and high level of moderator, whereas the red line denotes the effect of independent variable on dependent variable except moderating effect.

**Discussion**

Chronic renal failure is treated in patients who require long-term dialysis. Both hemodialysis and peritoneal dialysis have a profound impact on the lives of patients.
Hemodialysis is a life-sustaining treatment for those with end-stage renal illness. Hemodialysis can have a significant detrimental influence on a person’s overall health-related quality of life and outcomes (Zyoud et al., 2016). Many hemodialysis patients report having a poor quality of life in terms of lifestyle, social connections, and mental health (Nataatmadja et al., 2020). Because of their immune-compromised state and frail health, patients undergoing hospital HD are likely to be at a higher risk of getting severe COVID-19 (Gansevoort & Hilbrands, 2020). As a result, the study’s aims were to assess ESDR patients’ quality of life and illness acceptance during the duration of COVID-19. Because previous research has shown that COVID-19 has a significant impact on patients’ psychological health, this study examines the moderating effect of death anxiety.

Table 6. Structural Model Assessment with Interactions.

| Hypothesis | Relationships | Beta   | SE    | T-value | p-value | Decision |
|------------|---------------|--------|-------|---------|---------|----------|
| H1         | QOL -> IA     | 0.247  | 0.044 | 5.594   | 0.000   | Supported|
| H2         | QOL * DA -> IA| -0.265 | 0.044 | 5.955   | 0.000   | Supported|

Note: QOL = quality of life, IA = illness acceptance, DA = death anxiety.

Figure 3. Structural Model (Direct relationship and Moderating Effect).
All Urdu-translated instruments were employed in the current study because Urdu is Pakistan’s native language. The findings demonstrated that the instruments employed for data collection were culturally appropriate (Table 2). The scales’ convergent validity and reliability vary from 0.70 to 0.90, indicating strong reliability among the indigenous population. In the current study, the majority of the participants were elderly and feeble people over 65 (Table 1). Renal illness patients are a fragile elderly population that has a higher mortality rate than the overall population (Coppolino et al., 2020). The current study’s findings demonstrated that the load on self-care rose during the term of the COVID-19. Internalization of disease burden or a lack of acceptance of illness can occur as a result of frequent clinic and hospital visits, food restrictions, increased medication load, and home glucose, blood pressure, and weight monitoring (Song et al., 2017). Patients with ESDR in the current study stated (Table 1) that medical and psychological problems such as diabetes, high blood pressure, hepatitis, anxiety, sleeplessness, heart failure, aches, and fatigues after hemodialysis impacted their quality of life (Dąbrowska-Bender et al., 2018). The results revealed that only 4% of respondents had a psychological illness. Thus, the mental health of kidney transplant recipients does not appear to have been adversely affected by the COVID-19 pandemic and seclusion. Patients undergoing hemodialysis were more likely to experience back pain, headaches, and hypertension. Additionally, they indicated a greater onerousness factor related to dialysis (Lee et al., 2020).

The primary goal of this study was to examine quality of life, illness acceptance, and the moderating role of death anxiety in patients with kidney failure receiving hemodialysis in the period of COVID-19. The findings indicated that COVID-19 had an effect on patients’ quality of life and acceptance of illness, whereas death anxiety acted as a moderator of the association (Table 6). In this study, quality of life (environment,
general health, psychological health, and social relationships) scores were worse. Furthermore, factors linked to social dysfunction tended to be worse. This is unsurprising given that social isolation is a common problem among renal patients (Moorthi & Latham-Mintus, 2019). The significant relationship between poor quality of life and low acceptance of illness shows that anxiety is associated with an increase in a maladaptive attitude toward chronic renal disease (Table 6). Little research has examined the possible relationship between hemodialysis and patient acceptance of chronic renal illness. According to several of these studies, patients with a functioning kidney transplant have a significantly higher acceptance of illness score than patients on hemodialysis (Garcia-Llana et al., 2013; Kokoszka et al., 2016). Due to the rigorous and protracted nature of dialysis therapy, as well as the lack of time for work, hobbies, and other social activities, patients on hemodialysis face increased social isolation and support issues (Dbrowska-Bender et al., 2018; Goh & Griva, 2018).

The current study results showed that patients’ quality of life, illness acceptance, and suffering from death anxiety have poor quality of life. As a study revealed, acute renal illness has a relatively high mortality rate, even in the absence of COVID-19 infections (Diao et al., 2020). Furthermore, in-patient hospital mortality was 31.7% higher in 133 of 149 COVID-19 positive ESRD patients (Ng et al., 2020). According to another study, 44% of 710 hospitalized patients had proteinuria, 27% had hematuria, and 3.2% had acute renal injury, all of which were associated with a high death rate (Zhang & Parikh, 2019). Patients with chronic renal failure face a conundrum of death anxiety combined with a fear of living. Sixty-four percent of participants in an ESDR trial exhibited high levels of death anxiety. Approximately 70% of the patients had a low or moderate quality of life (Ghiasi et al., 2021). According to the findings, it is vital to address the death anxiety of ESDR patients receiving hemodialysis (Dewina et al., 2018). Health-related quality of life is a strong predictor of death and hospitalization, which may influence the prognosis and course of the illness. This decline in quality of life in dialysis patients is a result of death anxiety (Abdul Gafor et al., 2018). Another factor contributing to the current sample’s low quality of life may be their old age, low socioeconomic level, and lack of education and unemployment (Table 1). It is crucial to recognize the impact of death anxiety and poor quality of life in patients with end-stage renal disease (ESRD). It also highlights how end stage renal disease patients may be at risk of increased perceptions of death anxiety in the period COVID-19 as well as sleep disorders and psychological distress. Unnecessary delays in addressing these individuals’ mental health disorders will have an effect on the result of ESRD management.

**Conclusion**

COVID-19 poses a major health risk to humans. During the pandemic, the combined action of multiple causes resulted in a slew of psychological issues. Our research discovered some key facts that should be taken into account when treating ESRD patients. The results of the study showed that ESRD patients suffer from death anxiety and poor quality of life that affect their acceptance of illness. Poor quality of life was
connected with elderly patients who had no formal education and lived in a lower socioeconomic stratum. Furthermore, this study found that a lower quality of life was connected with a lower rate of disease acceptance. These findings should be of interest to educators, pharmacists, and clinicians who work with patients suffering from end-stage renal disease (ESRD). To help patients improve their QOL, healthcare professionals should be mindful of patients with inadequate formal education, many physical and psychological co-morbid diseases, and geriatric patients. To summarize, global health measures should be employed to treat psychological stress, especially in patients with end-stage renal disease (ESRD) and other chronic diseases.

**Limitation of the Study**

Because the study is cross-sectional, a cause-and-effect link between risk factors cannot be established. The target population was only end-stage renal disease. As data was collected in the period of Covid-19 and those patients who visited hospitals and hospitalized for dialysis, during the inquiry and research phases, Pakistan’s policy was to shut down Lahore, Punjab, and implement strict prevention and control measures across the country, such as donning masks, quarantining at home, and monitoring hospital workers. The local government enforced limits on dialysis clinics, which may have influenced patients' fear of death. It also highlights how end-stage renal disease patients may be at risk of increased perceptions of death anxiety in the period COVID-19 as well as sleep disorders and psychological distress.

**Declaration of Conflicting Interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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**References**

Abdul Gafor, A. H., Mohd, R., Cader, R., Kong, W. Y., Mohamad, M., Shah, S. A., Bain, A., & Kong, N. C. (2018). Evaluating cardiovascular risk in chronic kidney disease patients: A biomarker approach. *Sains Malaysiana*, 47(1), 149–155. [https://doi.org/10.17576/jsm-2018-4701-18](https://doi.org/10.17576/jsm-2018-4701-18)
Ahmad, W., & Javed, M. (2021). PKRDS data. Pakistan Journal of Kidney Diseases, 5(02), 39. https://doi.org/10.53778/pjkd502168

Benjamin, O., & Lappin, S. L. (2021). End-stage renal disease. StatPearls [Internet].

Chan, R. (2012). The effect of acceptance on health outcomes in patients with chronic kidney disease. Nephrology Dialysis Transplantation, 28(1), 11–14. https://doi.org/10.1093/ndt/gfs334

Chapter: 1 Definition and classification of CKD. (2013). Chapter: 1 Definition and classification of CKD. Kidney International Supplements, 3(1), 19–62. https://doi.org/10.1038/kisup.2012.64

Cheng, Y., Luo, R., Wang, K., Zhang, M., Wang, Z., Dong, L., Li, J., Yao, Y., Ge, S., & Xu, G. (2020). Kidney disease is associated with in-hospital death of patients with COVID-19. Kidney International, 97(5): 829–838. https://doi.org/10.1016/j.kint.2020.03.005

Chisini, L. A., Costa, F., dos, S., Demarco, G. T., Silveira, E. R., & Demarco, F. F. (2020). COVID-19 pandemic impact on paediatric dentistry treatments in the Brazilian Public Health System. International Journal of Paediatric Dentistry, 31(1), 31–34. https://doi.org/10.1111/ipd.12741

Cohen, S. D., Cukor, D., & Kimmel, P. L. (2016). Anxiety in patients treated with hemodialysis. Clinical Journal of the American Society of Nephrology, 11(12), 2250–2255. https://doi.org/10.2215/cjn.02590316

Coppolino, G., Presta, P., Nicotera, R., Placida, G., Vita, C., Carullo, N., Andreucci, M., Bollignano, D., Castagna, A., & Ruotolo, G. (2020). COVID-19 and renal disease in elderly patients. Geriatric Care, 6(2). https://doi.org/10.4081/gc.2020.9029

Coronavirus disease (COVID-19) World Health Organization. (2019). www.who.int. https://www.who.int/emergencies/diseases/novel-coronavirus-2019?gclid=EAIaIQobChMIvO-zpYn78gIViJftCh0vbgDrEAAYASAAEgKX9_D_BwE

Dałbrowska-Bender, M., Dykowska, G., Żuk, W., Milewska, M., & Staniszewska, A. (2018). The impact on quality of life of dialysis patients with renal insufficiency. Patient Preference and Adherence, 12, 577–583. https://doi.org/10.2147/paa.s156356

Dewina, A., Emaliyawati, E., & Praptiwi, A. (2018). Death Anxiety Level among Patients with Chronic Renal Failure Undergoing Hemodialysis. Journal of Nursing Care, 1(1), 1. https://doi.org/10.24198/jnc.v1i1.15757

Diao, B., Wang, C., Wang, R., Feng, Z., Tan, Y., Wang, H., Wang, C., Liu, L., Liu, Y., Liu, Y., Wang, G., Yuan, Z., Ren, L., Wu, Y., & Chen, Y. (2020). Human kidney is a target for novel severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2) infection. MedRxiv. https://doi.org/10.1101/2020.03.04.20031120

Docherty, A. B., Harrison, E. M., Green, C. A., Hardwick, H. E., Pius, R., Norman, L., Holden, K. A., Read, J. M., Dondelinger, F., Carson, G., Merson, L., Lee, J., Plotkin, D., Sigfrid, L., Halpin, S., Jackson, C., Gamble, C., Horby, P. W., Nguyen-Van-Tam, J. S., & Ho, A. (2020). Features of 20 133 UK patients in hospital with covid-19 using the ISARIC WHO clinical characterisation protocol: prospective observational cohort study. BMJ, 369. https://doi.org/10.1136/bmj.m1985

Eckardt, K.-U., Berns, J. S., Rocco, M. V., & Kasiske, B. L. (2009). Definition and classification of CKD: The debate should be about patient prognosis—A position statement from KDOQI
A primer on partial least squares structural equation modeling (PLS-SEM). Sage publications.

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*(1), 115–135. https://link.springer.com/article/10.1007/s11747-014-0403-8.

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal, 20*(2), 195–204. https://doi.org/10.1002/(SICI)1097-0266(199902)20:2<195::AID-SMJ13>3.0.CO;2-7
Jankowska-Polańska, B., Uchmanowicz, I., Wysocka, A., Uchmanowicz, B., Lomper, K., & Fal, A. M. (2016). Factors affecting the quality of life of chronic dialysis patients. *The European Journal of Public Health, 27*(2), 262–267. https://doi.org/10.1093/eurpub/ckw193

Kokoszka, A., Leszczyńska, K., Radzio, R., Daniewska, D., Łukasiewicz, A., Orzechowski, W., Piskorz, A., & Gellert, R. (2016). Prevalence of depressive and anxiety disorders in dialysis patients with chronic kidney disease. *Archives of Psychiatry and Psychotherapy, 18*(1), 8–13. https://doi.org/10.12740/app/61977

Lee, J., Steel, J., Roumelioti, M.-E., Erickson, S., Myaskovsky, L., Yabes, J. G., Rollman, B. L., Weisdorf, S., Unruh, M., & Jhamb, M. (2020). Psychosocial impact of COVID-19 pandemic on patients with end-stage kidney disease on hemodialysis. *Kidney360, 1*(12), 1390–1397. https://doi.org/10.34067/kid.0004662020

Moorthi, R. N., & Latham-Mintus, K. (2019). Social isolation in chronic kidney disease and the role of mobility limitation. *Clinical Kidney Journal, 12*(4), 602–610. https://doi.org/10.1093/ckj/sfy134

Moorti, R. N., & Latham-Mintus, K. (2019). Social isolation in chronic kidney disease and the role of mobility limitation. *Clinical Kidney Journal, 12*(4), 602–610. https://doi.org/10.1093/ckj/sfy134

Moraes, R. R., Correa, M. B., Queiroz, A. B., Daneris, Â., Lopes, J. P., Pereira-Cenci, T., D’Avila, O. P., Cenci, M. S., Lima, G. S., & Demarco, F. F. (2020). COVID-19 challenges to dentistry in the new pandemic epicenter: Brazil. *Plos One, 15*(11), e0242251. https://doi.org/10.1371/journal.pone.0242251

Mushtaque, I., Rizwan, M., Dasti, R. K., Ahmad, R., & Mushtaq, M. (2021b). Students’ attitude and impact of online learning; role of teachers and classmate support during the Covid-19 crisis. *Performance Improvement. Advance online publication. https://doi.org/10.1002/pfi.21982*

Nataatmadja, M., Evangelidis, N., Manera, K. E., Cho, Y., Johnson, D. W., Craig, J. C., Baumgart, A., Hanson, C. S., Shen, J., Guha, C., Scholes-Robertson, N., & Tong, A. (2020). Perspectives on mental health among patients receiving dialysis. *Nephrology Dialysis Transplantation, 36*(7), 1317–1325. https://doi.org/10.1093/ndt/gfaa346

Ng, J. H., Hirsch, J. S., Wanchoo, R., Sachdeva, M., Sakhya, V., Hong, S., Jhaveri, K. D., Fishbane, S., Abate, M., Andrade, H. P., Barnett, R. L., Bellucci, A., Bhaskaran, M. C., Corona, A. G., Flores Chang, B. S., Finger, M., Fishbane, S., Gitman, M., Halinski, C., & Hasan, S. (2020). Outcomes of patients with end-stage kidney disease hospitalized with COVID-19. *Kidney International, 98*(6), 1530–1539. https://doi.org/10.1016/j.kint.2020.07.030

Pfefferbaum, B., & North, C. S. (2020). Mental health and the Covid-19 pandemic. *New England Journal of Medicine, 383*(6). https://doi.org/10.1056/nejmp2008017

Pretto, C. R., Winkelmann, E. R., Hildebrandt, L. M., Barbosa, D. A., Colet, C. de F., Stumm, E. M. F., Pretto, C. R., Winkelmann, E. R., Hildebrandt, L. M., Barbosa, D. A., Colet, C. de F., & Stumm, E. M. F. (2020). Calidad de vida de pacientes renales crónicos en hemodiálisis y factores relacionados. *Revista Latino-Americana de Enfermagem, 28*, e3327. https://doi.org/10.1590/1518-8345.3641.3327

Rajan, E. J. E., & Subramanian, S. (2016). The effect of depression and anxiety on the performance status of end-stage renal disease patients undergoing hemodialysis. *Saudi Journal of Kidney Diseases and Transplantation, 27*(2), 331. https://doi.org/10.4103/1319-2442.178555
Saleem, T., Gul, S., & Saleem, S. (2015). Death anxiety scale. The Professional Medical Journal, 22(06), 723–732. https://doi.org/10.29309/tpmj/2015.22.06.1239

Saqib Lodhi, F., Raza, O., Montazeri, A., Nedjat, S., Yaseri, M., & Holakouie-Naieni, K. (2017). Psychometric properties of the Urdu version of the World Health Organization’s quality of life questionnaire (WHOQOL-BREF). Medical Journal of the Islamic Republic of Iran, 31(1), 853–859. https://doi.org/10.14196/mjiri.31.129

Song, M.-K., Ward, S., Paul, S., Gilet, C., & Hladik, J. (2017). MP715Trajectories of multi-dimensional quality of life among patients receiving chronic dialysis. Nephrology Dialysis Transplantation, 32(suppl_3), iii696. https://doi.org/10.1093/ndt/gfx180.mp715

Zahra, R., Baig, K., & Sadiq, U. (2020). Illness acceptance diabetes specific distress and quality of life among adolescents with type 1 diabetes mellites. Pakistan Journal of Physiology, 16(1), 37–40. http://www.pjp.pps.org.pk/index.php/PJP/article/view/1167.

Zhang, W. R., & Parikh, C. R. (2019). Biomarkers of Acute and Chronic Kidney Disease. Annual Review of Physiology, 81(1), 309–333. https://doi.org/10.1146/annurev-physiol-020518-114605

Zyoud, S. H., Daraghmeh, D. N., Mezyed, D. O., Khdeir, R. L., Sawafita, M. N., Ayaseh, N. A., Tabeeb, G. H., Sweileh, W. M., Awang, R., & Al-Jabi, S. W. (2016). Factors affecting quality of life in patients on haemodialysis: A cross-sectional study from Palestine. BMC Nephrology, 17(1), 44. https://doi.org/10.1186/s12882-016-0257-z