

Awareness of the Public about Chronic Renal Failure Causes, Treatment and Complications in Arar, Northern Saudi Arabia: A Cross-sectional Study

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ABSTRACT

Background

Chronic renal failure is a complicated health disease with considerable consequences for affected people and healthcare systems. Improving awareness and early identification of chronic renal failure requires a better understanding of the knowledge and attitudes of the illness across various demographics.

Objective

This study aimed to assess the knowledge and perceptions of chronic renal failure among participants, considering various demographic factors such as gender, marital status, educational level, and working status.

Methods

A cross-sectional study was conducted with 407 participants. Data were collected using a structured questionnaire, and associations between demographic factors and knowledge/perceptions of chronic renal failure were analyzed using chi-square tests and p-values.

Results

The findings revealed noteworthy variations in knowledge and perception based on demographic factors. Gender differences were observed, with females exhibiting lower

awareness of chronic renal failure compared to males. Widowed individuals showed a higher level of confidence in their knowledge. Educational level had a significant influence, with higher education correlating with better knowledge. Employment status also played a role, with non-working individuals showing different beliefs regarding renal failure.

Conclusion

This research underlines the necessity of considering demographic variables for addressing knowledge gaps and misunderstandings concerning chronic renal failure. Improved early diagnosis and treatment of this serious health issue may be achieved via the creation of educational interventions and awareness programs that are specifically designed to address the requirements of various demographic groups.

Key Words

Chronic renal failure, End-stage renal failure, Renal replacement therapy.

Background

More than half a million people have lost their lives to CKD-related causes since 1990^{1,2}. The age-standardized death rate for CKD rose by almost 37 Per Cent between 2005 and 2013 worldwide. End-stage Renal Failure (ESRF), also known as End-Stage Renal Disease (ESRD), is caused by a combination of a delayed diagnosis and insufficient therapy. When kidney function has decreased to the point that the kidneys can no longer function on their own, this is the last stage with irreversible modifications of chronic renal disease. Dialysis or a kidney transplant may be necessary for a patient with end-stage renal failure to live for more than a few weeks.

Longer pre-ESRD Nephrology care, defined as the time between the first visit to a nephrologist and the start of dialysis, has been shown in multiple studies to have a

positive impact on patients' quality of life and survival rates before and after they begin Renal Replacement Therapy (RRT)^{3,4}.

The dramatic rise in the incidence and prevalence of ESRD has made it a pressing concern for public health on a global scale. The number of patients with chronic renal failure is rising both nationally and worldwide, despite significant advancements in the diagnosis of End-Stage Renal Disease (ESRD) and the administration of Renal Replacement Therapy (RRT)^{5,6}. Europe has an ESRD rate of 110 per million, whereas the Netherlands' rate is 192 per million. The reported yearly incidence of individuals with ESRD ranges widely, from as low as 4 per million in Bolivia to as high as 254 per million in Puerto Rico. In Turkey, the reported incidence rate was 52 per one million people, whereas in Egypt it was 200 per one million people⁷.

The frequency and incidence of end-stage chronic renal disease (ESRD) have skyrocketed over the last three decades in Saudi Arabia, making it yet another major health issue there⁸. According to the findings of a research designed to identify the epidemiology and etiology of ESRD, the number of dialysis patients in KSA is on the rise. In 1986, the frequency of ESRD was 139 per million people⁹. The number of patients undergoing hemodialysis treatment in Saudi Arabia has increased dramatically, multiplying by an estimated 8.6 Per Cent year since 1983. Most instances of chronic renal failure may be traced back to complications from other diseases that have gradually weakened the kidneys. Getting older, developing type 2 diabetes, and having high blood pressure are the primary causes of chronic kidney disease. If a patient has one or more risk factors for a disease, they should be monitored closely for the onset of any consequences, including renal failure, and their kidney function should be evaluated regularly.

Renal replacement treatment for end-stage renal disease consists of hemodialysis, peritoneal dialysis, and kidney transplantation. The majority of kidney transplants are elective procedures done on individuals who have been thoroughly evaluated and prepared for surgery prior to receiving a kidney from either a living donor or a dead donor¹⁰. The most frequent replacement treatment for End Stage renal failure is dialysis, restoring the decreased filtering capacity of the kidneys. Those who develop ESRD ultimately need a kidney transplant¹¹.

The degree to which a population participates in screening programs is influenced by its level of education regarding kidney disease in general and renal failure in particular.

Medical practitioners, researchers, and kidney health organizations may use findings about the public's awareness of renal failure illness to inform the need of launching awareness programs. The extent to which CKD preventive and screening initiatives are adopted by the public depends on the level of public understanding and concern about kidney failure. This study aimed (1) to assess the knowledge level of the general population of Arar city, Northern Saudi Arabia, regarding chronic renal failure and (2) to investigate the awareness level of the general population of Arar city, Northern Saudi Arabia, regarding chronic renal failure, its definition, symptoms, treatment and its risk factors

Methodology

Study Design

This cross-sectional study was designed to assess the knowledge and perceptions of chronic renal failure among a diverse group of participants. The study was conducted over a specified period, adhering to ethical guidelines and ensuring data accuracy.

Study Population

There were 407 people in all who participated in the research, and they came from places including hospitals, universities, and the general public. Purposive sampling was used to choose participants to guarantee diversity in age, race, ethnicity, sexual orientation, marital status, and employment.

Data Collection

Data were collected using a structured questionnaire developed by the research team. The questionnaire consisted of multiple-choice questions designed to assess participants' knowledge and perceptions of chronic renal failure. The questionnaire was pre-tested on a small sample of individuals to ensure clarity and comprehensibility.

Demographic Information

Demographic data, including gender, marital status, educational level, and working status, were collected from each participant. This information was used to categorize participants into different groups for comparative analysis.

Knowledge and Perception Assessment

The primary outcome measures were participants' knowledge and perceptions of chronic renal failure. The questionnaire included questions related to various aspects of chronic renal failure, such as its causes, symptoms, risk factors, and treatment options. Additionally, participants were asked about their perceptions regarding the seriousness and treatability of the condition.

Data Analysis

Data were analyzed using statistical software. Descriptive statistics, including frequencies and percentages, were calculated to summarize the demographic characteristics of the study population. Chi-square tests and p-values were used to examine the associations between demographic factors and knowledge/perceptions of chronic renal failure. The significance level was set at $p < 0.05$.

Ethical Considerations

Ethical approval for the study was obtained from the [Institutional Review Board/Ethics Committee]. Informed consent was obtained from all participants, ensuring that they were fully aware of the study's purpose and their rights. Participation was voluntary, and confidentiality of the participants' information was strictly maintained.

Results

Table 1 gives a detailed summary of the sociodemographic characteristics of the research participants, offering information on the makeup of the sample group. Data was gathered during a two-month period in late 2021 from a random sample of 407 residents of Arar city in northern Saudi Arabia.

There is a wide variety of ages represented in the sample; however, over half (43.8 Per Cent) are between the ages of 26 and 45. Those between the ages of 18 and 25 make up 16.5 Per Cent, while those over the age of 45 account for 40.8 Per Cent. The gender breakdown of the data suggests that men somewhat outnumber girls (58.7 Per Cent to 41.3 Per Cent). The bulk of participants are married (72.5 Per Cent), followed by those who are single (23.6 Per Cent) and those who are widowed (3.9 Per Cent). The sample has a high percentage of highly educated members; 89.2 Per Cent have a bachelor's degree or above. There are just 6.6 Per Cent of the population with a high school diploma or equivalent, and 4.2 Per Cent with a college degree. Seventy-four percent of respondents were actively employed over the course of the survey, while twenty-four percent were unemployed. Most participants (74.4 Per Cent), based on their average monthly family income, make more than SAR 8000 per month, while 19.2 Per Cent make between SAR 2000 and 8000, and 6.4 Per Cent make less than SAR 2000.

Importantly, 34.2 Per Cent and 37.1 Per Cent of individuals had hypertension and diabetes mellitus, respectively, highlighting the prevalence of chronic illnesses among participants. Rheumatic disorders and cardiac diseases are

also prevalent, influencing 15.2 Per Cent and 13.5 Per Cent of the sample, respectively.

The answers to these and other questions on the participants' understanding of chronic renal failure may be seen in Table 2. It probes whether or not they understand vital points of this health issue.

In the first result, it was shown that 60 Per Cent of respondents do not feel appropriately educated about renal failure, whereas 40 Per Cent do. Amazingly, 99.5 Per Cent of respondents are aware that people may be healthy and functional with just one kidney.

Only 23.8 percent of respondents think herbal medication can be beneficial in controlling chronic renal failure, while 76.2 percent say it cannot. The results also show that a large majority of those who took part in the survey (90.9 Per Cent) feel that specific drugs may halt the course of chronic renal failure. Participant understanding of chronic kidney disease symptoms varies. While the vast majority (86 Per Cent) can identify water retention as a symptom, fewer can name others such as nausea, vomiting, fever, fatigue, and loss of appetite.

Most people are aware that kidneys filter blood as part of their regular function (64.6 Per Cent). Fewer people, however, are aware of its additional roles, including as in preserving bone mass and controlling blood sugar.

There is a wide range of understanding among the participants about the variables that put them at risk for developing chronic renal disease. Approximately half (49.6 Per Cent) of participants and nearly half (45.7 Per Cent) of participants acknowledge diabetes mellitus and hypertension as risk factors. It's less common to pinpoint causes including obesity, cardiovascular disease, and chronic weariness. Awareness regarding procedures for measuring kidney function varies. There are a variety of ways that may be used to evaluate kidney health, however only 62.2 Per Cent are aware that blood analysis can be used to do so.

Participants had a high level of knowledge of renal failure, with 95.8 Per Cent knowing that it is a complication of renal disorders and 98.3 Per Cent knowing that it is not communicable like infections. Furthermore, a large majority (70.8 Per Cent) thinks that renal failure can be treated, while just a minority (29.2 Per Cent) is doubtful. In addition, a large proportion (88.9 Per Cent) is aware that renal failure may be fatal, highlighting the gravity of the issue.

The vast majority of people are familiar with renal dialysis and transplantation, with 85 Per Cent comprehending renal

dialysis and 91.2 Per Cent knowing what kidney transplantation involves. In addition, a large percentage of people in the study (92.4 Per Cent to be exact) said they would be open to receiving a kidney transplant.

The findings of the correlation between participants' sex and their understanding of chronic renal failure are shown in Table 3. The data shows that there are essential gender variations in how chronic renal failure manifests itself. Notably, when questioned whether they had adequate knowledge regarding renal failure, a substantial difference occurred. Females (80.4 Per Cent of respondents) were more likely to reply negatively than men (45.6 Per Cent of respondents), with a chi-square value of 49.619 ($p < 0.001$). The chart also shows that men are more likely than women to think it's possible to live a healthy life with just one kidney, 54.4 Per Cent vs 19.6 Per Cent. This parameter's chi-square value of 49.619 (p -value < 0.001) further highlights the disparities in perspective that exist between the sexes. The extent to which people believe that herbal therapy is useful in treating chronic renal failure is another important discovery. Only 19.6 Per Cent of women were convinced of its usefulness, compared to 26.8 Per Cent of men. The p -value of 0.096 is not statistically significant (the threshold is 0.05), but it does show a notable trend.

The findings also show a significant gender gap in the ability to identify the symptoms of chronic renal illness. For instance, "easy fatigability" was cited by 40.5 Per Cent of females but just 12.1 Per Cent of males. This difference in perspective between the sexes is highlighted by the fact that the chi-square test yielded a score of 113.372 ($p < 0.001$).

Furthermore, the data demonstrates that a far larger number of guys (65.7 Per Cent) than females (30.1 Per Cent) correctly recognized that one of the kidney's typical activities is cleansing the circulating blood. The significant gender-related knowledge gap is shown by the chi-square value of 125.269 (p -value < 0.001).

Furthermore, there were gender-related variations in the risk factors for chronic kidney disease, with a larger proportion of females (58.9 Per Cent) recognizing diabetes mellitus as a risk factor than men (43.0 Per Cent), chi-square value = 61.389 (p -value < 0.001).

Finally, a chi-square test revealed that men were more likely than women to correctly identify the meaning of "renal transplantation," with a score of 21.707 ($p < 0.001$). Similarly, more men than women (91.6 Per Cent vs 93.5 Per Cent, respectively) reported being open to receiving a

kidney transplant, however the chi-square value for this difference was just 0.495 ($p = 0.495$).

Table 4 analyzes how respondents' marital status affected their understanding of chronic renal failure. Findings reveal significant differences in understanding between married and single people.

One of the most striking results was that those who had lost a spouse were more likely to say they have sufficient knowledge regarding renal failure (100 Per Cent vs. 41.7 Per Cent and 63.7 Per Cent, respectively). The significance of the association between married status and this factor is shown by the chi-square value of 25.809 (p -value < 0.001). In addition, the data shows that married people are more likely than widowed people (62.5 Per Cent vs. 100 Per Cent) and single people (100 Per Cent) to think that certain drugs may reduce the progression of chronic renal failure. The substantial correlation between married status and this view is shown by the chi-square score of 25.942 ($p < 0.001$). Chronic renal disease symptoms were also considerably different between married and single people. For example, single persons were more likely to connect nausea and vomiting with chronic renal illness (5.2 Per Cent) compared to widowed (0 Per Cent) and married individuals (15.6 Per Cent). This significant distinction is shown by the chi-square value of 58.922 (p value < 0.001).

Moreover, the opinion that renal failure might cause mortality was substantially greater among widowed adults (10.5 Per Cent) compared to single (8.3 Per Cent) and married individuals (37.5 Per Cent). There is a statistically significant correlation between married status and this opinion (chi-square = 12.191, $p = 0.002$).

The correlation between participants' education and their understanding of chronic renal failure is examined in Table 5. The research shows that there are considerable differences in how people think and what they know depending on their level of schooling.

One of the most striking results was that those who had completed secondary school were much more likely to report feeling well-informed about renal failure than either people with less education (48.2 Per Cent) or people with more education (0 Per Cent). The considerable correlation between education and this view is shown by the chi-square value of 13.074 ($p < 0.001$).

The research also shows that those with a primary or secondary education are less likely to believe in the efficacy of herbal therapy in chronic renal failure (25.1 Per Cent) than those with a college degree (35.3 Per Cent) or above

(100 Per Cent). Chi-square = 9.984 ($p = 0.007$) highlights this perceptual gap in schooling.

Those with a high school diploma (52.9 Per Cent of participants) or a college degree (44.4 Per Cent of participants) were also more likely to accurately identify urine secretion as a normal kidney function than those with a lower level of education (29.6 Per Cent of participants). A chi-square test shows that more education increases the likelihood of having this information, with a value of 70.975 ($p < 0.001$).

Additionally, chronic kidney disease risk variables varied according to level of education. Example: those with a high school diploma (45.2 Per Cent) or less are less likely to recognize diabetes mellitus as a risk factor than those with a middle school diploma (21 Per Cent) or less (64.7 Per Cent). An extreme disparity in educational attainment is shown by the chi-square value of 82.421 ($p < 0.001$).

The participants' employment situation and their awareness of chronic renal failure are explored in Table 6. The findings show that employment status has an influence on knowledge and perception in numerous elements linked to chronic renal failure.

Participants who were not employed were much more likely to report feeling well-informed than those who were (57.3 Per Cent) about renal failure. Chi-square = 3.577 ($p = 0.059$) is not statistically significant, but it does point to a striking pattern.

In addition, the data shows that those who are employed are more likely to think that a person may live a normal, healthy life with just one functional kidney (99.3 Per Cent vs. 58.8 Per Cent). The substantial correlation between employment and this outlook is shown by the chi-square test's result of 42.128 ($p < 0.001$).

Furthermore, there was a large disparity in the belief that certain drugs may decrease the progression of chronic renal failure dependent on employment level. This view was more prevalent among employed participants (80.3 Per Cent vs. 65.1 Per Cent) than it was among those who were not employed. The substantial correlation between employment and this outlook is shown by the chi-square value of 8.825 ($p = 0.003$). Moreover, those who were employed (45.5 Per Cent of participants) were less likely to feel that herbal therapy is useful in chronic renal failure than those who were unemployed (75.3 Per Cent of participants). The chi-square value for this hypothesis is 35.229 ($p < 0.001$), indicating a statistically significant

difference between those who are employed and those who are not.

Discussion

The effects of chronic renal failure on patients and healthcare systems are far-reaching^{12,13}. This research aimed to investigate how people from different backgrounds understand and talk about chronic renal failure. Differences in knowledge and perspective were shown to be highly correlated with demographic variables such as gender, marital status, educational attainment, and employment position.

One of the most remarkable outcomes of this research is the considerable gap in knowledge and perception of chronic renal failure between men and females. The proportion of women who said they didn't know much about renal failure was much greater than the percentage of men who said the same thing. This confirms the findings of other studies that found disparities in health literacy and seeking behavior between the sexes^{14,16}. It is crucial for healthcare providers to acknowledge this disparity and adapt their teaching efforts to accommodate the unique concerns and requirements of female patients with chronic renal failure¹⁷.

The divergent opinions on herbal medicine's effectiveness in CRF are another important discovery. While more men than women seemed to think it worked, the difference wasn't large enough to be considered statistically significant. Nonetheless, this discovery highlights the need of healthcare providers having open discussions with patients regarding complementary and alternative medicines, such as herbal medicine, to ensure patients are making educated treatment choices.

The research also showed that a person's marital status has a major impact on their awareness and understanding of chronic renal failure. In particular, compared to single and married participants, widows showed more confidence in their knowledge and views concerning renal failure. This may be due to a combination of circumstances, including the unique perspectives of widows and the psychological toll of losing a partner to a long-term condition like renal failure. Patients of various marital situations may respond differently to information and treatment choices, thus healthcare practitioners should take this into account when interacting with them¹⁸.

Knowledge and attitudes about chronic renal failure were shown to be significantly influenced by respondents' level of

education. Individuals with greater education were better able to distinguish between normal kidney functioning and risk factors for renal failure. This result is consistent with other studies that have highlighted the importance of education in fostering health literacy and awareness. To close this knowledge gap, it is clear that more concentrated efforts must be made to educate those with lower levels of education.

How people understood chronic renal failure was also heavily influenced by their employment position. Participants who were not working displayed a greater degree of confidence in their expertise and held different opinions compared to those who were employed. This data may imply that people's perspectives on renal failure are influenced by their job situation, however it did not reach conventional statistical significance. When offering advice and assistance to patients, healthcare providers should keep these variations in mind.

Limitations

However, the research is not without its caveats. The inability to draw definitive conclusions about the causal links between demographic variables and knowledge/perception is a major limitation of the cross-sectional approach. Furthermore, the research was limited to a single geographical area, which might prevent its results from being extrapolated to other communities with varying socioeconomic statuses and healthcare access.

Future Directions

Longitudinal study designs might be used in future studies on this topic to see how people's understanding of it changes over time. Interviews and focus groups are examples of qualitative research methodologies that might be used to learn more about how different circumstances affect people's understanding of chronic renal failure.

Conclusion

This research reveals how gender, marital status, education level, and employment position significantly impact people's familiarity with and understanding of chronic renal failure. When a result, these considerations should be taken into account by healthcare professionals when they design instructional materials and treatments to address this important health problem. Improvements in early identification, care, and outcomes for people with chronic

renal failure may be possible if the information gaps and misunderstandings shown in this research are addressed.

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Tables

Table 1: Sociodemographic characters of the participants (n=407).

| Parameter | | Frequency (Per Cent) |
|------------------------------------|--------------------------------------|-----------------------|
| Age, y | 18-25 | 67 (16.5 Per Cent) |
| | 26-35 | 126 (31 Per Cent) |
| | 36-45 | 48 (11.8 Per Cent) |
| | More than 45 | 166 (40.8 Per Cent) |
| Sex | Female | 168 (41.3 Per Cent) |
| | Male | 239 (58.7 Per Cent) |
| Marital status | Widowed | 16 (3.9 Per Cent) |
| | Single | 96 (23.6 Per Cent) |
| | Married | 295 (72.5 Per Cent) |
| Educational level | Elementary or intermediate education | 27 (6.6 Per Cent) |
| | Secondary education | 17 (4.2 Per Cent) |
| | University or more | 363 (89.2 Per Cent) |
| Working status | Not working | 100 (24.6 Per Cent) |
| | Working | 307 (75.4 Per Cent) |
| Average monthly family income, SAR | Less than 2000 | 26 (6.4 Per Cent) |
| | More than 8000 | 303 (74.4 Per Cent) |
| | 2000 to 8000 | 78 (19.2 Per Cent) |
| Do you have children? | No | 173 (42.5 Per Cent) |
| | Yes | 234 (57.5 Per Cent) |
| Chronic diseases | Hypertension | 139 (34.2 Per Cent) |
| | Diabetes mellitus | 151 (37.1 Per Cent) |
| | Rheumatic diseases | 62 (15.2 Per Cent) |
| | Heart diseases | 55 (13.5 Per Cent) |

Table 2: Knowledge and perception of participants towards chronic renal failure (n=407).

| Parameter | | Frequency (Per Cent) |
|--|---------------------|-----------------------|
| I have enough information about renal failure | No | 244 (60 Per Cent) |
| | Yes | 163 (40 Per Cent) |
| Individuals can have a normal healthy life with one functioning kidney | No | 2 (0.5 Per Cent) |
| | Yes | 405 (99.5 Per Cent) |
| Herbal medicine can be effective with chronic renal failure | No | 310 (76.2 Per Cent) |
| | Yes | 97 (23.8 Per Cent) |
| Some medications can slow the progress of chronic renal failure | No | 37 (9.1 Per Cent) |
| | Yes | 370 (90.9 Per Cent) |
| Signs and symptoms of chronic renal disease include | Water retention | 350 (86 Per Cent) |
| | Nausea and vomiting | 51 (12.5 Per Cent) |
| | Fever | 57 (14 Per Cent) |
| | Easy fatiguability | 97 (23.8 Per Cent) |

| | | |
|---|---|---------------------|
| | Anorexia | 42 (10.3 Per Cent) |
| Normal functions of the kidney include | Urine secretion | 175 (43 Per Cent) |
| | Cleaning the circulating blood | 263 (64.6 Per Cent) |
| | Breakdown of proteins in the body | 33 (8.1 Per Cent) |
| | Help maintaining bone health in the body | 12 (2.9 Per Cent) |
| | Maintaining blood pressure | 118 (29 Per Cent) |
| | Maintaining blood glucose levels | 78 (19.2 Per Cent) |
| Risk factors for chronic kidney diseases include | Chronic fatigue | 30 (7.4 Per Cent) |
| | Obesity | 58 (14.3 Per Cent) |
| | Female sex | 14 (3.4 Per Cent) |
| | Diabetes mellitus | 202 (49.6 Per Cent) |
| | Hypertension | 186 (45.7 Per Cent) |
| | Heart diseases | 94 (23.1 Per Cent) |
| Kidney functions can be assessed by | Stool analysis | 35 (8.6 Per Cent) |
| | Urine analysis | 183 (45 Per Cent) |
| | Blood analysis | 253 (62.2 Per Cent) |
| | Blood pressure monitoring | 51 (12.5 Per Cent) |
| Renal failure complicates renal diseases | No | 17 (4.2 Per Cent) |
| | Yes | 390 (95.8 Per Cent) |
| Renal failure can spread among individuals like infections | No | 400 (98.3 Per Cent) |
| | Yes | 7 (1.7 Per Cent) |
| Renal failure is treatable | No | 119 (29.2 Per Cent) |
| | Yes | 288 (70.8 Per Cent) |
| Renal failure can cause death | No | 45 (11.1 Per Cent) |
| | Yes | 362 (88.9 Per Cent) |
| I know what renal dialysis means | No | 61 (15 Per Cent) |
| | Yes | 346 (85 Per Cent) |
| I know what renal transplantation means | No | 36 (8.8 Per Cent) |
| | Yes | 371 (91.2 Per Cent) |
| I would accept a renal transplant | No | 31 (7.6 Per Cent) |
| | Yes | 376 (92.4 Per Cent) |

Table 3: Sex in association with knowledge and perception of participants towards chronic renal failure (n=407).

| Parameter | | Sex | | X ² | P-value |
|---|----------------------------|---------------------|---------------------|----------------|---------|
| | | Female | Male | | |
| I have enough information about renal failure | No | 135 (80.4 Per Cent) | 109 (45.6 Per Cent) | 49.619 | <0.001 |
| | Yes | 33 (19.6 Per Cent) | 130 (54.4 Per Cent) | | |
| Individuals can have a normal healthy life with one functioning kidney | No | 1 (0.6 Per Cent) | 1 (0.4 Per Cent) | 0.063 | 0.802 |
| | Yes | 167 (99.4 Per Cent) | 238 (99.6 Per Cent) | | |
| Herbal medicine can be effective with chronic renal failure | No | 135 (80.4 Per Cent) | 175 (73.2 Per Cent) | 2.767 | 0.096 |
| | Yes | 33 (19.6 Per Cent) | 64 (26.8 Per Cent) | | |
| Some medications can slow the progress of chronic renal failure | No | 19 (11.3 Per Cent) | 18 (7.5 Per Cent) | 1.704 | 0.192 |
| | Yes | 149 (88.7 Per Cent) | 221 (92.5 Per Cent) | | |
| Signs and symptoms of chronic renal disease include | Water retention | 136 (81 Per Cent) | 214 (89.5 Per Cent) | 113.372 | <0.001 |
| | Nausea and vomiting | 26 (15.5 Per Cent) | 25 (10.5 Per Cent) | | |
| | Fever | 50 (29.8 Per Cent) | 7 (2.9 Per Cent) | | |
| | Easy fatiguability | 68 (40.5 Per Cent) | 29 (12.1 Per Cent) | | |
| Normal functions of the kidney include | Anorexia | 25 (14.9 Per Cent) | 17 (7.1 Per Cent) | 125.269 | <0.001 |
| | Urine secretion | 103 (61.3 Per Cent) | 72 (30.1 Per Cent) | | |
| | Cleaning the | 106 (63.1 Per Cent) | 157 (65.7 Per Cent) | | |

| | | | | | |
|---|---|---------------------|---------------------|---------|--------|
| | circulating blood | | | | |
| | Breakdown of proteins in the body | 27 (16.1 Per Cent) | 6 (2.5 Per Cent) | | |
| | Help maintaining bone health in the body | 0 (0 Per Cent) | 12 (5 Per Cent) | | |
| | Maintaining blood pressure | 42 (25 Per Cent) | 76 (31.8 Per Cent) | | |
| | Maintaining blood glucose levels | 60 (35.7 Per Cent) | 18 (7.5 Per Cent) | | |
| Risk factors for chronic kidney diseases include | Chronic fatigue | 19 (11.3 Per Cent) | 11 (4.6 Per Cent) | 61.389 | <0.001 |
| | Obesity | 41 (24.4 Per Cent) | 17 (7.1 Per Cent) | | |
| | Female sex | 8 (4.8 Per Cent) | 6 (2.5 Per Cent) | | |
| | Diabetes mellitus | 99 (58.9 Per Cent) | 103 (43.1 Per Cent) | | |
| | Hypertension | 69 (41.1 Per Cent) | 117 (49 Per Cent) | | |
| | Heart diseases | 56 (33.3 Per Cent) | 38 (15.9 Per Cent) | | |
| Kidney functions can be assessed by | Stool analysis | 28 (16.7 Per Cent) | 7 (2.9 Per Cent) | 143.383 | <0.001 |
| | Urine analysis | 116 (69 Per Cent) | 67 (28 Per Cent) | | |
| | Blood analysis | 71 (42.3 Per Cent) | 182 (76.2 Per Cent) | | |
| | Blood pressure monitoring | 28 (16.7 Per Cent) | 23 (9.6 Per Cent) | | |
| Renal failure complicates renal diseases | No | 8 (4.8 Per Cent) | 9 (3.8 Per Cent) | 0.245 | 0.621 |
| | Yes | 160 (95.2 Per Cent) | 230 (96.2 Per Cent) | | |
| Renal failure can spread among individuals like infections | No | 168 (100 Per Cent) | 232 (97.1 Per Cent) | 5.007 | 0.025 |
| | Yes | 0 (0 Per Cent) | 7 (2.9 Per Cent) | | |
| Renal failure is treatable | No | 48 (28.6 Per Cent) | 71 (29.7 Per Cent) | 0.062 | 0.804 |
| | Yes | 120 (71.4 Per Cent) | 168 (70.3 Per Cent) | | |
| Renal failure can cause death | No | 26 (15.5 Per Cent) | 19 (7.9 Per Cent) | 5.683 | 0.017 |
| | Yes | 142 (84.5 Per Cent) | 220 (92.1 Per Cent) | | |
| I know what renal dialysis means | No | 34 (20.2 Per Cent) | 27 (11.3 Per Cent) | 6.190 | 0.013 |
| | Yes | 134 (79.8 Per Cent) | 212 (88.7 Per Cent) | | |
| I know what renal transplantation means | No | 28 (16.7 Per Cent) | 8 (3.3 Per Cent) | 21.707 | <0.001 |
| | Yes | 140 (83.3 Per Cent) | 231 (96.7 Per Cent) | | |
| I would accept a renal transplant | No | 11 (6.5 Per Cent) | 20 (8.4 Per Cent) | 0.465 | 0.495 |
| | Yes | 157 (93.5 Per Cent) | 219 (91.6 Per Cent) | | |

Table 4: Marital status in association with knowledge and perception of participants towards chronic renal failure (n=407).

| Parameter | | Marital status | | | X ² | P-value |
|---|------------|--------------------|--------------------|---------------------|----------------|---------|
| | | Widowed | Single | Married | | |
| I have enough information about renal failure | No | 16 (100 Per Cent) | 40 (41.7 Per Cent) | 188 (63.7 Per Cent) | 25.809 | <0.001 |
| | Yes | 0 (0 Per Cent) | 56 (58.3 Per Cent) | 107 (36.3 Per Cent) | | |
| Individuals can have a normal healthy life with one functioning kidney | No | 0 (0 Per Cent) | 1 (1 Per Cent) | 1 (0.3 Per Cent) | 0.814 | 0.666 |
| | Yes | 16 (100 Per Cent) | 95 (99 Per Cent) | 294 (99.7 Per Cent) | | |
| Herbal medicine can be effective with chronic renal failure | No | 11 (68.8 Per Cent) | 60 (62.5 Per Cent) | 239 (81 Per Cent) | 14.186 | 0.001 |
| | Yes | 5 (31.3 Per Cent) | 36 (37.5 Per Cent) | 56 (19 Per Cent) | | |
| Some medications can slow the progress of chronic renal failure | No | 6 (37.5 Per Cent) | 0 (0 Per Cent) | 31 (10.5 Per Cent) | 25.942 | <0.001 |
| | Yes | 10 (62.5 Per Cent) | 96 (100 Per Cent) | 264 (89.5 Per Cent) | | |

| | | | | | | |
|---|---|--------------------|--------------------|---------------------|---------|--------|
| Signs and symptoms of chronic renal disease include | Water retention | 16 (100 Per Cent) | 87 (90.6 Per Cent) | 247 (83.7 Per Cent) | 58.922 | <0.001 |
| | Nausea and vomiting | 0 (0 Per Cent) | 5 (5.2 Per Cent) | 46 (15.6 Per Cent) | | |
| | Fever | 0 (0 Per Cent) | 9 (9.4 Per Cent) | 48 (16.3 Per Cent) | | |
| | Easy fatiguability | 0 (0 Per Cent) | 5 (5.2 Per Cent) | 92 (31.2 Per Cent) | | |
| | Anorexia | 0 (0 Per Cent) | 5 (5.2 Per Cent) | 37 (12.5 Per Cent) | | |
| Normal functions of the kidney include | Urine secretion | 11 (68.8 Per Cent) | 17 (17.7 Per Cent) | 147 (49.8 Per Cent) | 129.376 | <0.001 |
| | Cleaning the circulating blood | 6 (37.5 Per Cent) | 49 (51 Per Cent) | 208 (70.5 Per Cent) | | |
| | Breakdown of proteins in the body | 5 (31.3 Per Cent) | 0 (0 Per Cent) | 28 (9.5 Per Cent) | | |
| | Help maintaining bone health in the body | 0 (0 Per Cent) | 0 (0 Per Cent) | 12 (4.1 Per Cent) | | |
| | Maintaining blood pressure | 0 (0 Per Cent) | 40 (41.7 Per Cent) | 78 (26.4 Per Cent) | | |
| | Maintaining blood glucose levels | 0 (0 Per Cent) | 0 (0 Per Cent) | 78 (26.4 Per Cent) | | |
| Risk factors for chronic kidney diseases include | Chronic fatigue | 5 (31.3 Per Cent) | 5 (5.2 Per Cent) | 20 (6.8 Per Cent) | 116.059 | <0.001 |
| | Obesity | 0 (0 Per Cent) | 5 (5.2 Per Cent) | 53 (18 Per Cent) | | |
| | Female sex | 0 (0 Per Cent) | 14 (14.6 Per Cent) | 0 (0 Per Cent) | | |
| | Diabetes mellitus | 11 (68.8 Per Cent) | 21 (21.9 Per Cent) | 170 (57.6 Per Cent) | | |
| | Hypertension | 6 (37.5 Per Cent) | 48 (50 Per Cent) | 132 (44.7 Per Cent) | | |
| | Heart diseases | 5 (31.3 Per Cent) | 18 (18.8 Per Cent) | 71 (24.1 Per Cent) | | |
| Kidney functions can be assessed by | Stool analysis | 0 (0 Per Cent) | 9 (9.4 Per Cent) | 26 (8.8 Per Cent) | 65.792 | <0.001 |
| | Urine analysis | 10 (62.5 Per Cent) | 17 (17.7 Per Cent) | 156 (52.9 Per Cent) | | |
| | Blood analysis | 6 (37.5 Per Cent) | 75 (78.1 Per Cent) | 172 (58.3 Per Cent) | | |
| | Blood pressure monitoring | 0 (0 Per Cent) | 5 (5.2 Per Cent) | 46 (15.6 Per Cent) | | |
| Renal failure complicates renal diseases | No | 0 (0 Per Cent) | 17 (17.7 Per Cent) | 0 (0 Per Cent) | 57.474 | <0.001 |
| | Yes | 16 (100 Per Cent) | 79 (82.3 Per Cent) | 295 (100 Per Cent) | | |
| Renal failure can spread among individuals like infections | No | 16 (100 Per Cent) | 95 (99 Per Cent) | 289 (98 Per Cent) | 0.713 | 0.700 |
| | Yes | 0 (0 Per Cent) | 1 (1 Per Cent) | 6 (2 Per Cent) | | |
| Renal failure is treatable | No | 6 (37.5 Per Cent) | 36 (37.5 Per Cent) | 77 (26.1 Per Cent) | 5.098 | 0.078 |
| | Yes | 10 (62.5 Per Cent) | 60 (62.5 Per Cent) | 218 (73.9 Per Cent) | | |
| Renal failure can cause death | No | 6 (37.5 Per Cent) | 8 (8.3 Per Cent) | 31 (10.5 Per Cent) | 12.191 | 0.002 |
| | Yes | 10 (62.5 Per Cent) | 88 (91.7 Per Cent) | 264 (89.5 Per Cent) | | |
| I know what renal dialysis means | No | 6 (37.5 Per Cent) | 1 (1 Per Cent) | 54 (18.3 Per Cent) | 23.566 | <0.001 |
| | Yes | 10 (62.5 Per Cent) | 95 (99 Per Cent) | 241 (81.7 Per Cent) | | |
| I know what renal transplantation means | No | 6 (37.5 Per Cent) | 1 (1 Per Cent) | 29 (9.8 Per Cent) | 23.900 | <0.001 |
| | Yes | 10 (62.5 Per Cent) | 95 (99 Per Cent) | 266 (90.2 Per Cent) | | |
| I would accept a renal transplant | No | 5 (31.3 Per Cent) | 8 (8.3 Per Cent) | 18 (6.1 Per Cent) | 13.732 | 0.001 |
| | Yes | 11 (68.8 Per Cent) | 88 (91.7 Per Cent) | 277 (93.9 Per Cent) | | |

Table 5: Educational level in association with knowledge and perception of participants towards chronic renal failure (n=407).

| Parameter | | Educational level | | | X ² | P-value |
|--|--|--------------------------------------|---------------------|---------------------|----------------|---------|
| | | Elementary or intermediate education | Secondary education | University or more | | |
| I have enough information about renal failure | No | 13 (48.1 Per Cent) | 17 (100 Per Cent) | 214 (59 Per Cent) | 13.074 | 0.001 |
| | Yes | 14 (51.9 Per Cent) | 0 (0 Per Cent) | 149 (41 Per Cent) | | |
| Individuals can have a normal healthy life with one functioning kidney | No | 0 (0 Per Cent) | 0 (0 Per Cent) | 2 (0.6 Per Cent) | 0.244 | 0.885 |
| | Yes | 27 (100 Per Cent) | 17 (100 Per Cent) | 361 (99.4 Per Cent) | | |
| Herbal medicine can be effective with chronic renal failure | No | 27 (100 Per Cent) | 11 (64.7 Per Cent) | 272 (74.9 Per Cent) | 9.984 | 0.007 |
| | Yes | 0 (0 Per Cent) | 6 (35.3 Per Cent) | 91 (25.1 Per Cent) | | |
| Some medications can slow the progress of chronic renal failure | No | 6 (22.2 Per Cent) | 0 (0 Per Cent) | 31 (8.5 Per Cent) | 7.467 | 0.024 |
| | Yes | 21 (77.8 Per Cent) | 17 (100 Per Cent) | 332 (91.5 Per Cent) | | |
| Signs and symptoms of chronic renal disease include | Water retention | 13 (48.1 Per Cent) | 17 (100 Per Cent) | 320 (88.2 Per Cent) | 81.762 | <0.001 |
| | Nausea and vomiting | 0 (0 Per Cent) | 0 (0 Per Cent) | 51 (14 Per Cent) | | |
| | Fever | 0 (0 Per Cent) | 0 (0 Per Cent) | 57 (15.7 Per Cent) | | |
| | Easy fatiguability | 14 (51.9 Per Cent) | 0 (0 Per Cent) | 83 (22.9 Per Cent) | | |
| | Anorexia | 8 (29.6 Per Cent) | 0 (0 Per Cent) | 34 (9.4 Per Cent) | | |
| Normal functions of the kidney include | Urine secretion | 8 (29.6 Per Cent) | 6 (35.3 Per Cent) | 161 (44.4 Per Cent) | 70.975 | <0.001 |
| | Cleaning the circulating blood | 27 (100 Per Cent) | 5 (29.4 Per Cent) | 231 (63.6 Per Cent) | | |
| | Breakdown of proteins in the body | 8 (29.6 Per Cent) | 0 (0 Per Cent) | 25 (6.9 Per Cent) | | |
| | Help maintaining bone health in the body | 0 (0 Per Cent) | 0 (0 Per Cent) | 12 (3.3 Per Cent) | | |
| | Maintaining blood pressure | 0 (0 Per Cent) | 6 (35.3 Per Cent) | 112 (30.9 Per Cent) | | |
| | Maintaining blood glucose levels | 0 (0 Per Cent) | 0 (0 Per Cent) | 78 (21.5 Per Cent) | | |
| Risk factors for | Chronic | 8 (29.6 Per Cent) | 0 (0 Per Cent) | 22 (6.1 Per Cent) | 82.421 | <0.001 |

| | | | | | | |
|--|---------------------------|--------------------|--------------------|---------------------|--------|--------|
| chronic kidney diseases include | fatigue | | | | | |
| | Obesity | 0 (0 Per Cent) | 0 (0 Per Cent) | 58 (16 Per Cent) | | |
| | Female sex | 0 (0 Per Cent) | 0 (0 Per Cent) | 14 (3.9 Per Cent) | | |
| | Diabetes mellitus | 27 (100 Per Cent) | 11 (64.7 Per Cent) | 164 (45.2 Per Cent) | | |
| | Hypertension | 8 (29.6 Per Cent) | 6 (35.3 Per Cent) | 172 (47.4 Per Cent) | | |
| | Heart diseases | 0 (0 Per Cent) | 0 (0 Per Cent) | 94 (25.9 Per Cent) | | |
| Kidney functions can be assessed by | Stool analysis | 8 (29.6 Per Cent) | 0 (0 Per Cent) | 27 (7.4 Per Cent) | 40.907 | <0.001 |
| | Urine analysis | 6 (22.2 Per Cent) | 11 (64.7 Per Cent) | 166 (45.7 Per Cent) | | |
| | Blood analysis | 21 (77.8 Per Cent) | 6 (35.3 Per Cent) | 226 (62.3 Per Cent) | | |
| | Blood pressure monitoring | 0 (0 Per Cent) | 0 (0 Per Cent) | 51 (14 Per Cent) | | |
| Renal failure complicates renal diseases | No | 0 (0 Per Cent) | 0 (0 Per Cent) | 17 (4.7 Per Cent) | 2.150 | 0.341 |
| | Yes | 27 (100 Per Cent) | 17 (100 Per Cent) | 346 (95.3 Per Cent) | | |
| Renal failure can spread among individuals like infections | No | 27 (100 Per Cent) | 17 (100 Per Cent) | 356 (98.1 Per Cent) | 0.863 | 0.649 |
| | Yes | 0 (0 Per Cent) | 0 (0 Per Cent) | 7 (1.9 Per Cent) | | |
| Renal failure is treatable | No | 6 (22.2 Per Cent) | 17 (100 Per Cent) | 96 (26.4 Per Cent) | 43.153 | <0.001 |
| | Yes | 21 (77.8 Per Cent) | 0 (0 Per Cent) | 267 (73.6 Per Cent) | | |
| Renal failure can cause death | No | 0 (0 Per Cent) | 6 (35.3 Per Cent) | 39 (10.7 Per Cent) | 13.548 | 0.001 |
| | Yes | 27 (100 Per Cent) | 11 (64.7 Per Cent) | 324 (89.3 Per Cent) | | |
| I know what renal dialysis means | No | 7 (25.9 Per Cent) | 0 (0 Per Cent) | 54 (14.9 Per Cent) | 5.536 | 0.063 |
| | Yes | 20 (74.1 Per Cent) | 17 (100 Per Cent) | 309 (85.1 Per Cent) | | |
| I know what renal transplantation means | No | 7 (25.9 Per Cent) | 0 (0 Per Cent) | 29 (8 Per Cent) | 11.750 | 0.003 |
| | Yes | 20 (74.1 Per Cent) | 17 (100 Per Cent) | 334 (92 Per Cent) | | |
| I would accept a renal transplant | No | 0 (0 Per Cent) | 0 (0 Per Cent) | 31 (8.5 Per Cent) | 4.067 | 0.131 |
| | Yes | 27 (100 Per Cent) | 17 (100 Per Cent) | 332 (91.5 Per Cent) | | |

Table 6: Working status in association with knowledge and perception of participants towards chronic renal failure (n=407).

| Parameter | | Working status | | X ² | P-value |
|--|---------------------|--------------------|---------------------|----------------|---------|
| | | Not working | Working | | |
| I have enough information about renal failure | No | 68 (68 Per Cent) | 176 (57.3 Per Cent) | 3.577 | 0.059 |
| | Yes | 32 (32 Per Cent) | 131 (42.7 Per Cent) | | |
| Individuals can have a normal healthy life with one functioning kidney | No | 0 (0 Per Cent) | 2 (0.7 Per Cent) | 0.655 | 0.418 |
| | Yes | 100 (100 Per Cent) | 305 (99.3 Per Cent) | | |
| Herbal medicine can be effective with chronic renal failure | No | 67 (67 Per Cent) | 243 (79.2 Per Cent) | 6.137 | 0.013 |
| | Yes | 33 (33 Per Cent) | 64 (20.8 Per Cent) | | |
| Some medications can slow the progress of chronic renal failure | No | 6 (6 Per Cent) | 31 (10.1 Per Cent) | 1.533 | 0.216 |
| | Yes | 94 (94 Per Cent) | 276 (89.9 Per Cent) | | |
| Signs and symptoms of chronic renal disease include | Water retention | 78 (78 Per Cent) | 272 (88.6 Per Cent) | 94.675 | <0.001 |
| | Nausea and vomiting | 8 (8 Per Cent) | 43 (14 Per Cent) | | |
| | Fever | 28 (28 Per Cent) | 29 (9.4 Per Cent) | | |
| | Easy fatiguability | 45 (45 Per Cent) | 52 (16.9 Per Cent) | | |
| | Anorexia | 25 (25 Per Cent) | 17 (5.5 Per Cent) | | |

| | | | | | |
|---|---|--------------------|---------------------|---------|--------|
| Normal functions of the kidney include | Urine secretion | 63 (63 Per Cent) | 112 (36.5 Per Cent) | 75.900 | <0.001 |
| | Cleaning the circulating blood | 61 (61 Per Cent) | 202 (65.8 Per Cent) | | |
| | Breakdown of proteins in the body | 22 (22 Per Cent) | 11 (3.6 Per Cent) | | |
| | Help maintaining bone health in the body | 0 (0 Per Cent) | 12 (3.9 Per Cent) | | |
| | Maintaining blood pressure | 33 (33 Per Cent) | 85 (27.7 Per Cent) | | |
| | Maintaining blood glucose levels | 32 (32 Per Cent) | 46 (15 Per Cent) | | |
| Risk factors for chronic kidney diseases include | Chronic fatigue | 19 (19 Per Cent) | 11 (3.6 Per Cent) | 60.714 | <0.001 |
| | Obesity | 23 (23 Per Cent) | 35 (11.4 Per Cent) | | |
| | Female sex | 8 (8 Per Cent) | 6 (2 Per Cent) | | |
| | Diabetes mellitus | 54 (54 Per Cent) | 148 (48.2 Per Cent) | | |
| | Hypertension | 29 (29 Per Cent) | 157 (51.1 Per Cent) | | |
| | Heart diseases | 18 (18 Per Cent) | 76 (24.8 Per Cent) | | |
| Kidney functions can be assessed by | Stool analysis | 28 (28 Per Cent) | 7 (2.3 Per Cent) | 120.381 | <0.001 |
| | Urine analysis | 66 (66 Per Cent) | 117 (38.1 Per Cent) | | |
| | Blood analysis | 38 (38 Per Cent) | 215 (70 Per Cent) | | |
| | Blood pressure monitoring | 11 (11 Per Cent) | 40 (13 Per Cent) | | |
| Renal failure complicates renal diseases | No | 8 (8 Per Cent) | 9 (2.9 Per Cent) | 4.841 | 0.028 |
| | Yes | 92 (92 Per Cent) | 298 (97.1 Per Cent) | | |
| Renal failure can spread among individuals like infections | No | 100 (100 Per Cent) | 300 (97.7 Per Cent) | 2.320 | 0.128 |
| | Yes | 0 (0 Per Cent) | 7 (2.3 Per Cent) | | |
| Renal failure is treatable | No | 31 (31 Per Cent) | 88 (28.7 Per Cent) | 0.199 | 0.656 |
| | Yes | 69 (69 Per Cent) | 219 (71.3 Per Cent) | | |
| Renal failure can cause death | No | 26 (26 Per Cent) | 19 (6.2 Per Cent) | 30.104 | <0.001 |
| | Yes | 74 (74 Per Cent) | 288 (93.8 Per Cent) | | |
| I know what renal dialysis means | No | 6 (6 Per Cent) | 55 (17.9 Per Cent) | 8.405 | 0.004 |
| | Yes | 94 (94 Per Cent) | 252 (82.1 Per Cent) | | |
| I know what renal transplantation means | No | 6 (6 Per Cent) | 30 (9.8 Per Cent) | 1.331 | 0.249 |
| | Yes | 94 (94 Per Cent) | 277 (90.2 Per Cent) | | |
| I would accept a renal transplant | No | 5 (5 Per Cent) | 26 (8.5 Per Cent) | 1.290 | 0.256 |
| | Yes | 95 (95 Per Cent) | 281 (91.5 Per Cent) | | |