ANALYTICAL STUDY OF THE FACTORS AFFECTING RENAL FAILURE USING THE CORRECT CORRELATIOn

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ABSTRACT: *Kidney failure is a serious disease that affects most people and both sexes. There are many factors that can affect this disease. These factors are the factors affecting kidney failure and types of renal failure. The extent of their impact on the infected, where the use of statistical method of correlation for the purpose of the purpose of analysis of data and knowledge of those factors and factors, has been reached important conclusions for those suffering from this disease and the possibility of reducing the incidence of the disease in the future.*

Keywords: renal failure; correct correlation; Analytical study; semiconductor nanoparticles; magnetic stirrer.

1. INTRODUCTION

The general concept of true correlation analysis is to study the linear relationship between two linear structures of group X which includes p of the variables and the second of the group Y which includes q of the variables without the need to specify The range of independent variables and the set of variables adopted, and the importance of this analysis and its ability to measure the relationship between the two groups and each group to predict the other group and then reduce these relationships to the lowest possible number of variables as each pair of variables, each pair of valid variables is represented by a simple correlation coefficient.

2. MODEL OF CANONICAL CORRELATION

If we have (n) of observations (p) represent the first set of variables (q) represent the second set of variables so that $P \geq q$ $n \geq p+q$ which are:

. $X=x_{ij}$ $i=1,2,\dots,n$ $j=1,2,\dots,p$

$Y=y_{ik}$ $i=1,2,\dots,n$ $k=1,2,\dots,q$

The linear compositions of the two groups are:

$v = \underline{d}'Y \quad , \quad u = \underline{c}'X$

$\underline{d}'$ and $\underline{c}'$

The weight vector of each linear combination of the two groups respectively, since the number of pairs of linear structures resulting from the correct analysis is equal to the number of variables in the lower group and

R=min(p,q)

and R Represents the number of pairs of linear structures. The analysis involves selecting the first valid correlation which gives the greatest possible correlation to the remaining pairs, provided that it is not associated with the first pair. This is done with the rest of the valid links in this way, the proportion of the common variation between pairs of valid variables is gradually reduced to the last valid correlation.

3. CALCULATING THE WEIGHTS OF THE CANONICAL WEIGHTS

It can be obtained from the relevant links (weights) based on the matrix of variances and common differences and according to the following formula:

$$S = \begin{bmatrix} S_{xx} & S_{xy} \\ \acute{S}_{xy} & S_{yy} \end{bmatrix}$$

S is the common variance matrix for the X-class PxP

S is the common variance matrix for the X and Y-class Pxn

S is the common variance matrix for the Y and Y-class PxP

To calculate the proper weights, use the following characteristic vector equation

$(M - \lambda I)d = 0$ …………….[1]

$M = S_{yy}^{-1} S_{yx} S_{xx}^{-1} S_{xy}$……[2]

So that if $p \leq q$, the equation from which the proper correlation is derived is

$S_{xx} = {}^{-1}S_{xy}{}^{-1}S_{yy}{}^{-1}S_{yx}\lambda_{yx} - \lambda I$ …….[3]

If $q \leq p$ is the equation from which the correct correlation is extracted

$S_{xx} = {}^{-1}S_{yx}\, S_{xx}{}^{-1}S_{yy}\,.\lambda I$ …….[4]

4. THE TRUE CORRELATION PROPERTIES

1 - All two variables of the true correlation form a linear composition

2 - All the variables are random with an average of 0 and variance 1

3 - The links in the linear structures are as follows:

$\text{corr}(u_i, u_j) = 0 \text{ if } (i \neq j) \quad , \quad \text{corr}(u_i, u_j) = 1 \text{ , if } (i = j)$

$\text{corr}(v_i, v_j) = 0 \text{ if } (i \neq j) \quad , \quad \text{corr}(v_i, v_j) = 1 \text{ if}(i = j)$

$\text{corr}(u_i, v_j) = 0 \text{ if}(i \neq j) \quad , \quad \text{corr}(u_i, v_j) = 1 \text{ if } (i = j)$

4-The correlation coefficient between (-1-1) and thus have the same characteristics of the simple correlation coefficient

5 - The matrix of the variance and the common contrast is finite and non – zero

6 - The correlation is true as the contrast of the opposite XS explains the difference In (YS) and vice versa for each pair of valid variables

7 - If $p \leq q$ the equation used to find the correct correlation is

$|R_{XX}^{-1}\ R_{XY}\ R_{YY}^{-1}\ R_{YX}\ - \lambda\, I| = 0$

When $q \leq p$ the equation used to find the correct correlation is

$|R_{YY}^{-1}\ R_{YX}\ R_{XX}^{-1}\ R_{XY}\ - \lambda\, I| = 0$

5.MORAL CORRELATION TEST

The hypothesis of the test is defined according to the following formula:

$H_0 : R_{XY} = 0$

$H_1 : R_{XY} \neq 0$

The statistic (X^2) is used to determine the significant and valid variables that are sufficient to illustrate the relationship between two sets of variables and the formula:

$\chi^2_{cal} = [-n + 0.5(p + q + 3)] \log W \dots \dots \dots [5]$

W is called the Wilk count and is calculated as follows:

$$Wilks \leftarrow W = \prod_{Z=i}^{r} (1 - R_{CZ}^2) \dots \dots \dots \dots [6]$$

R_{CZ}^2

True correlation coefficient box if the valid correlation is not significant, the other valid correlation coefficients are also insignificant.

6. WEIGH WEIGHTS

We consider the importance of the effect of the first group and the effect of the second group using the statistical tool called the true correlation, which is based on the right weights, which show the strength of any of the variables of the first group relative to the same variables of another group As well as the effect of any of the variables of the second group relative to the variables of the same other group.

7. STRUCTURAL COEFFICIENTS

The structure of the Coefficients can be used to analyze the results of the true correlation which are limited to the period (1, -1), known as the correlation between the original variables and the valid variables. The square of the correct synthetic parameter represents its contribution to the interpretation of the variation in the correct variable. The value of the correct structural parameter is limited to (1, 1) If any of the Rxx, Ryy matrix is a unit matrix, then the correct structural coefficients are equal to the proper weights, otherwise the structural coefficients differ from the proper weights.

8. COEFFICIENT ADEQUACY

The coefficient of quality adequacy is defined as the ratio of the interpretation of the variable in the total variation in the variables of a single group, ranging from zero to one. Data Collection Research data from Kadhim Hospital were collected Of the patients with renal failure, where the study of (80) patients with this disease and study the factors that affect the disease, the sample consisted of two groups of factors the first group included factors affecting the disease renal failure (age, gender, pressure, sugar) The variables (XS) and the second group factors represent the types of kidney failure (bladder blockage, chronic glomerulonephritis, hereditary renal thrombosis, urinary tract infection) and variables (YS). Analysis of results.

9.ANALYSIS OF THE RESULTS

The results of the data were analyzed using the correct correlation analysis. Table (1) shows that the value of the first correlation is the largest correlation and the only significant significance where its value is equal to 0.736538, which is a high linear correlation. The value of X^2 is equal (62.17044). This value is greater than the tabular value with a freedom equal to (16). Therefore, the null hypothesis that the independence of the two groups (X and Y) is rejected is concluded. We conclude that there is a relationship of significant effect between the two groups Ie, the first group of factors affecting renal failure has had a clear and significant impact on the variables of the second group and the types of renal failure disease.

Table (1) relevant links and their tests

Canonical				Lambda	
Root	R	R-sqr	Chi-sqr	df	P
1	0.736538	0.542488	62.17044	16	0.000000
2	0.219355	0.048117	3.91504	9	0.916903
3	0.051134	0.002615	0.24124	4	0.993284
4	0.024897	0.000620	0.04619	1	0.829824

8.WEAK WEIGHTS OF THE FIRST GROUP (FACTORS AFFECTING RENAL FAILURE)

The first group (X group) weights are shown in Table (2) by the force of their effect in the second group (Y group)

Table (2) appropriate weight values for the variables of the first group

Proper weight	Variable description	variable
0.857631	High pressure	X_3
0.797995	diabetes	X_4
-0.755589	gender	X_2
-0.739557	age	X_1

The above table shows that the third variable (X3 represents pressure) is the most influential in the second group variables, which represent (types of renal failure disease) where the patients who are affected by pressure have a stronger effect on the types of renal failure disease, followed by the fourth variable (X4 represents diabetes In terms of the strength of influence in the types of renal failure, which means people with diabetes, their effect is stronger than the rest of the variables for types of renal failure, while the second variable (X2 represents gender) comes third in its impact on the types of kidney failure This means that male and female sufferers have a strong impact on the incidence of renal failure, and the first variable (X1 represents age) is the last variable affecting the types of renal failure. This means that the effect of age on the types of disease of failure may be low on patients with different types of Kidney failure.

10. PROPER WEIGHT FOR THE SECOND GROUP (GROUP Y)

it represents the variables of the type of renal failure disease, is shown in Table (3) and is determined by the strength of its effect in the first group (group X). Table (3) represents strong weight values. In the first set (set X).

Table (3) represents the appropriate weight values for the variables of the second group

Proper weight	Variable description	variable
0.776519	Hereditary kidney disease	Y_3
-0.753938	urinary incontinence	Y_1
-0.713962	glomerulonephritis	Y_4
-0.662694	hronic	Y_2

In the table above, it is clear that the third variable (Y3 represents the total renal polycystic), the most influential variable on the first group, which is the factors affecting renal failure, followed by the first variable (Y1 represents bladder blockage), which has a strong effect on the factors affecting renal failure and the fourth variable (Y4 represents urinary tract infection) have an effect on the types of renal failure, while the second variable (Y2 represents chronic glomerulonephritis) is the last variable affecting the types of renal failure disease That is, it is the least variable that is indicative of the types of disease. Table (4) shows the percentage of the contribution of explanatory variables and their effect on the interpretation of the total variation in the adopted variables. However, these variables were different in their effect ratios by explaining the variation in the valid variables, It was found that the structural factor of the fourth root only was greater than 0.30 and is the standard used to determine the effectiveness of the variables. Most researchers in the correct analysis indicate that the structural coefficients must be no less than this criterion to be considered as having an active contribution in the formation of the strong variable For the group the rest of the variables were less than this standard.

Table (4) ratio of the total variance of the independent variables

rank	Contribution value	Variable root
1	0.312658	4
2	0.288491	2
3	0.231317	3
4	0.167534	1

The significance of the relationship between the two groups was examined.
The significance of the valid correlations with their distinct values was determined according to Table (5)

Table (5) distinguished values and the valid link values

Contribution value	Variable root
0.736538	0.542488
0.219355	0.048117
0.051134	0.002615
0.024897	0.000620

11. CONCLUSIONS

The third variable, which is the pressure, is the most influential factor in the types of renal failure
. 2 - The third variable of the second group, which represents the total renal macrosis, is the most influential on the variables of the first group, which are the factors that affect on the variables of the first group and the factors that affect the disease of renal failure.
3 - The ratio of total variation of the independent variables was the largest proportion of the fourth root, which was 0.312658 of the rest of the other variables.

12. RECOMMENDATIONS

1. Extend statistical analysis in a timely fashion For Renal Failure patients benefit from the results.
2 - Full awareness of citizens through the media and publicity for the purpose of prevention and treatment of the correct and complete and the development of medical devices and the use of modern means to reduce the incidence of this disease and treatment in the best ways

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