ASSESSMENT OF NUTRITIONAL STATE IN PREVALENT HEMODIALYSIS PATIENTS AND ITS IMPACT ON QUALITY OF LIFE.

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ABSTRACT:

Background: *Patients undergoing hemodialysis (HD) frequently suffer from malnutrition and low quality of life QOL, which can have severe consequences such as an increased risk of hospitalization and mortality. Both have recently been identified as two critical targets for dialysis adequacy.*

Aim of the work: *We aimed to determine whether there is a relationship between nutritional status and QOL in our HD patients.*

Patients and Methods: *At Damanhur Medical National Institute, a cross-sectional study was conducted on 100 patients on regular HD. We determined the correlation using the Pearson correlation test after assessing nutritional status with the malnutrition inflammation score (MIS) and QOL with the valid Arabic version of the short form 12 questionnaire version1 (SF-12v1) to determine the correlation using the Pearson correlation test. In addition, univariate analysis was used to assess the degree of MIS effect on SF-12v1 components.*

Results: *MIS had significant negative correlation with SF-12v1 components regarding physical component summary (PCS) where (r= -.498, p=.0001), mental component summary (MCS) (r= -.497, p=.0001) and total QOL score (r= -.554, p=.0001). MIS of patients was highly statistically significant in predicting PCS as the model explained (24.8%) of variability in PCS of QoL of patients, as each increase in MIS led to a significant decrease in PCS by 3.17 as (b,t,p) = (-3.17,-5.69,.0001) respectively.*

Conclusion: *Among our patients, MIS had a significant negative correlation with PCS, MCS, and the total SF12v1 score. Patients' MIS was highly statistically significant in predicting PCS, MCS, and the total score of SF12v1.*

Keywords: *Quality of Life, SF12 version1, Malnutrition, MIS, Hemodialysis.*

INTRODUCTION:

HD is a well-known therapeutic modality. Managing patients on dialysis is extremely challenging[(1)]. In addition, QOL is low in HD patients[(2)]. The Dialysis Outcomes Quality Initiative (DOQI), held in 2000, found that patients with end-stage

renal disease (ESRD) had more significant morbidity and mortality rates if they had nutritional difficulties. Variability in patients' health-related quality of life (HRQOL) may be influenced by a variety of factors, including biological function, mental illness, general health perception, and (HRQOL). Elevated levels of C-reactive protein (CRP), interleukin 6, interleukin 8, and tumor necrosis factor α (TNF- α) are among the biomarkers for HRQOL[(3)]. Among the eight nutrition-related tests

evaluated, MIS and albumin are the strongest predictors of mortality in HD patients. Since there are no significant differences in terms of the added value, serum albumin is the most precise predictor of mortality in HD patients[4]. Regarding QOL, Only MIS has the strongest correlation with all domains in terms of QOL[5].

Chronic kidney disease (CKD) patients are more likely to experience impaired physical activity than the general population[6]. The lack of exercise might negatively impact an individual's QOL. Cases with chronic health issues, as well as those with limited social and work roles, may experience a decline in well-being[7]. The SF-36 questionnaire established reference values for all HRQOL components; general health, social function, and physical function are the most strongly impacted. ESRD has a significant psychological influence on daily life [8]. In HD patients, a substantial correlation was found between HRQOL and both mortality and hospitalization[9]. Despite substantial resources and significant improvements in the quality of dialysis treatments, dialysis patients continue to face high mortality and morbidity, as well as a decline in HRQOL[10].

AIM OF THE WORK:

Lastly and after the above-mentioned data that explored the need for further research in the factors affecting the quality of life, our study was aimed to assess nutritional status in prevalent HD patients and its impact on quality of life.

PATIENTS AND METHODS:

Data Collection Methods and Subjects: The ethics committee at Ain Shams University approved this cross-sectional study, carried out in the HD unit at Damanhur Medical National Institute. The study was carried out on 100 patients according to the following criteria.

Inclusion criteria: Patients ≥ 18 years old and maintained on regular HD for more than six months with: three sessions /week, four hours for each session, bicarbonate-containing dialysate and heparin -based anticoagulation.

Exclusion criteria:

- Physically inactive patients, e.g., handicapped or bedridden.
- Patients with other uncontrolled debilitating disease such as: malignancies. Active autoimmune disease, an active inflammatory condition and decompensated liver disease.

All patients were subjected to the questionnaires after oral informed consent was given about the study's purpose and the questionnaires:

- **Complete History including** SF12v1 questionnaire (short form questionnaire with 12 questions, version1).
- **Clinical examination, including** MIS (malnutrition inflammation score):
- **The Following Investigations:** Complete blood picture, urea reduction ratio, Serum albumin, Serum ferritin, total iron binding capacity (TIBC), lipid profile and C - reactive protein.

An expert nurse measured the anthropometric markers. During the interviews, the researcher completed questionnaires and a clinical examination. All studies were conducted at the hospital's laboratory, and data were collected using the same procedures for personnel history records.

Table 1: MIS; malnutrition inflammation score[11].

(A) **Patients related medical history:**			
1-Change in end dialysis dry weight (overall change in past 3-6 months)			
0	1	2	3
No decrease in dry weight or weight loss <0.5 kg	Minor weight loss (>0.5 kg but <1 kg)	Weight loss more than one kg <5%	Weight loss >5%
2- Dietary intake:			
0	1	2	3
Good appetite and no deterioration of the dietary intake pattern	Somewhat sub-optimal solid diet intake	Moderate overall decrease to full liquid diet	Hypo-caloric liquid to starvation
3- Gastrointestinal (GI) symptoms:			
0	1	2	3
No symptoms with good appetite	Mild symptoms, poor appetite or nauseated occasionally	Occasional vomiting or moderate GI symptoms	Frequent diarrhea or vomiting or severe anorexia
4-Function capacity (nutritionally related functional impairment):			
0	1	2	3
Normal to improved functional capacity ,felling fine	Occasional difficulty with baseline ambulation ,or feeling tired frequently	Difficulty with otherwise independent activities (e.g .going to bathroom)	Bed/chair-ridden, or little to no physical activity
5- Co-morbidity including number of years on Dialysis:			
0	1	2	3
On dialysis less than one year and healthy otherwise	Dialyzed for 1-4 years , or mild co-morbidity (excluding MCC*)	Dialyzed >4 years , or moderate co-morbidity (including one MCC*)	Any severe , multiple co-morbidity (2 or more MCC*)
(B) Physical Exam (according to SGA criteria):			
6- Decreased fat stores or less of subcutaneous fat (below eyes , triceps, biceps , chest):			
0	1	2	3
Normal (no change)	Mild	Moderate	Severe
7-Sings of muscle wasting (temple, clavicle, scapula ,ribs , quadriceps, knee , interosseous):			
0	1	2	3
Normal (no change)	Mild	Moderate	Severe
(c) Body mass index:			
8-Body mass index: BMI =WT (KG) / HT^2(m):			
0	1	2	3
BM≥ 20 kg/m^2	BMI:18-19.99 kg/m^2	BMI:16-17.99 kg/m^2	BMI<16 kg/m^2
(D) Laboratory PARAMETERS:			
9- Serum albumin:			
0	1	2	3
Albumin ≥ 4.0 g/dl	Albumin:3.5-3.9 g/dl	Albumin:3.0-3.4 g/dl	Albumin: <3.0 g/dl
10- Serum TIBC (total iron Binding capacity):			
0	1	2	3
TIBC >250 mg/dl	TIBC:200.249 mg/dl	TIBC:150-199 mg/dl	TIBC <150 mg/dl
Total score = Sum of above 10 components (0-30):			

* major comorbid condition included congestive heart failure class III or IV , full-blow AIDS, severe coronary artery disease , moderate to severe chronic obstructive pulmonary disease, major neurologic sequelae , and metastatic malignancies or recent chemotherapy Suggested equivalent increments for serum transferrin are > 200 (0), 170 to 200 (1), 140 to 170(2) , and <140 mg/dl.

Exposure Assessment: The nutritional status, as measured by the malnourished inflammatory score, was the primary source of our exposure (MIS). A standard index system of the precise malnutrition-inflammation score (MIS) is a combination of reliable and valid methodologies such as (anthropometric measures, biochemical parameters, performance evaluation, and a thorough evaluation of diet or the Subjective Global Assessment method (SGA) [13].

All patients were interviewed, and their medical records were entered into a computer database. SGA and three non-SGA components were included in this new complete nutritional assessment instrument (MIS): BMI, serum albumin, and total iron-binding capacity (TIBC). Therefore, the total MIS score includes ten questions, each with a status ranging from 0 (normal) to 3 (the most severe), totally; a score of zero (normal) to 30 (severe malnutrition) [14]. Seca scales (Germany) with an accuracy of ±100 g can be used to take dry weight measurements within 10 to 20 minutes of a dialysis session.

Table 2: SF12V1; Short form12 version1 [12].

The 12-item short form health survey (SF-12)			
Scales	NO	Items Contents (abridged)	Response Categories
PCS-12	1	General health	Excellent/Very good/Good/Fair/Poor
	2	Moderate activities	Limited a Lot/Limited a little/Not limited at all
	3	Climb several flights of stairs	Limited a Lot/Limited a little/Not limited at all
	4	Accomplished less(physical)	Yes/No
	5	Limited in kind of work	Yes/No
	8	Pain- interference	Not at all /A little bit/ Moderately /Quite a bit/Extremely
MCS-12	6	Accomplished less(emotional)	Yes/No
	7	Did work less careful	Yes/No
	9	Calm and peaceful	All of the time/Most of time /A good bit of the time/Some of the time /A little of the time /None of the time
	10	Energy	All of the time/Most of time /A good bit of the time/Some of the time /A little of the time /None of the time
	11	Downhearted and blue	All of the time/Most of time /A good bit of the time/Some of the time /A little of the time /None of the time
	12	Social limitations – time	All of the time/Most of time /A good bit of the time/Some of the time /A little of the time /None of the time

Outcome Assessment:

The SF12v1 questionnaire was used to assess QOL, which was our primary outcome of interest. Subsequently, the SF-36 components were used to build the SF-12, a generic instrument. Physical component summary (PCS) and mental component summary (MCS) are two summary scores that can be generated, with higher scores indicating better physical and mental health. An abbreviated version of the 36-item Short Form Health Survey (SF-36), the SF-12 can be used to measure HRQOL practically [15]. It has been determined that the Arabic Egyptian SF-36 can be utilized to assess the QOL of burn cases in Egypt [16].

The original 36-item questionnaire was reduced to eight subscales.: functions that are

physical (PF, two objects), physical limits restricting one's abilities (RP, two items), bodily pain (BP, 1 item), vitality (VT, 1 item), role limitations due to emotional problems (RE, 2 items), social functioning (SF, 1 item), mental health (MH, two items), as well as general health perceptions (GH, 1 item). Several studies worldwide have investigated the SF-12's psychometric properties and factor structure. Most studies demonstrated that this tool is characterized by a high level of reliability and validity that can be applied to a wide range of populations [17].

In cohort studies, SF-12 can be used to assess changes in HRQOL among dialysis patients. Both SF-12 and SF-36 have been linked to both short- and long-term mortality[18].

Scales and Component Summaries:

Because the scales were created and scored using principal components analysis, they are collectively referred to as "component" summaries. All items are utilized to score both the physical and mental health component summary measures, despite the fact that they represent two broad elements of health.

Statistical Analysis:

Data Management and Analysis:

The SPSS version 25 statistical program for the social sciences was used to code and enter the data (IBM Corp., Armonk, NY, USA). Each parameter's data was presented and analyzed in accordance with the type of data collected.

Descriptive Statistics:

- A measure of central tendency.
- Quantitative variables' dispersion is measured using the standard deviation and range.
- Categorical variables' frequency (number of cases) and relative frequency (%).

Analytical Statistics:

- **Independent sample t-test (t)**: determines the statistical significance of a parametric variable discrepancy between two independent means of two research groups.
- **Pearson correlation coefficient (r):** The strength of a linear relationship between two quantitative variables was measured using correlation. The correlation coefficient range, r, is from +1 to -1. A value of 0 indicates that there is no correlation between the two variables. A positive correlation is a correlation in which the value of one variable increases in tandem with the value of the other. Values less than zero indicate that one variable has a negative correlation while the other has a positive association [19].
- **Univariate analysis:** Multiple regressions with univariate analysis revealed a correlation between MIS and PCS, MCS, and the overall SF12v1 score. The student t-test and analysis of variance (ANOVA) with multiple comparisons post hoc test can also be used to determine the degree of association between groups based on comparisons between them. According to the model, it is possible to determine the degree of variance in each independent variable, as demonstrated by the relationship to MIS. The unstandardized beta, which can be negative or positive, indicates whether they are inversely or directly correlated.

RESULTS:

Table 3: Socio-demographic characteristics associated Comorbid diseases of study sample

Characteristics		Study sample (n = 100)
Age (years)	Mean± SD Range	50.4 ± 13.2 21 -78
Gender	Male (%) Female (%)	60(60%) 40 (40%)
BMI (Kg/m2)	Mean± SD Range	26.8 ±5.7 17 – 52
Smoking	Smoker (%) Non Smoker (%)	26(26%) 74(74%)
Diabetes Mellitus	Positive Negative	10 (10%) 90 (90%)
Hypertension	Positive Negative	74 (74%) 26 (26%)
Cerebrovascular stroke	Positive Negative	5 (5%) 95 (95%)
Ischemic Heart Disease	Positive Negative	19 (19%) 81 (81%)
Peripheral Arterial Disease	Positive Negative	5 (5%) 95 (95%)

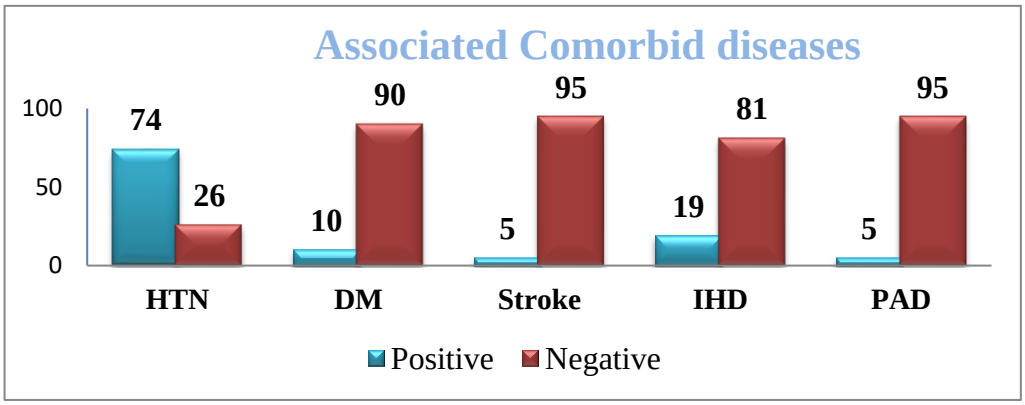

Diagram1: Distribution of study sample according to Associated Comorbid diseases

Table 4: Distribution of study sample according to clinical examination & investigations

Clinical Examination & Investigations	Mean ± SD	(Min –Max)
Systolic Blood Pressure (mmHg)	144.1 ± 20.7	100 -180
Diastolic Blood Pressure (mmHg)	88.6± 12.5	60 – 110
Dialysis Vintage /Month	79.7 ±66.3	7 – 348
Dry Weight (Kg)	75.8 ± 16.3	43 -117
CRP (mg/ml)	11.5 ± 11.8	0 – 48
Albumin (g/dl)	4 ±.45	2.9- 5.2
Urea Reduction Ratio (%)	69.3 ±10.8	35-97
Hemoglobin (g/dl)	11.12 ±8.3	6.4-92
Total Iron Binding Capacity (mg/dl)	236.3±50.3	132.5-376
Ferritin (ng/ml)	522.98±493.7	6.3 -2195
Cholesterol (mg/dl)	178.4±45.6	89 – 309
Triglyceride (mg/dl)	156.7 ±100.6	30-630
HDL Cholesterol (mg/dl)	37.1±11.13	17 -71
LDL Cholesterol (mg/dl)	110.6 ± 36.4	58-224

Table 5: Assessment of study sample as regards Malnutrition inflammation score

MIS Score	Study sample (n = 100)
MIS	
Mean± SD	7.39 ± 3.74
Range	0 -17
MIS	
Mild Malnutrition (%)	79(79%)
Moderate Malnutrition (%)	21 (21%)

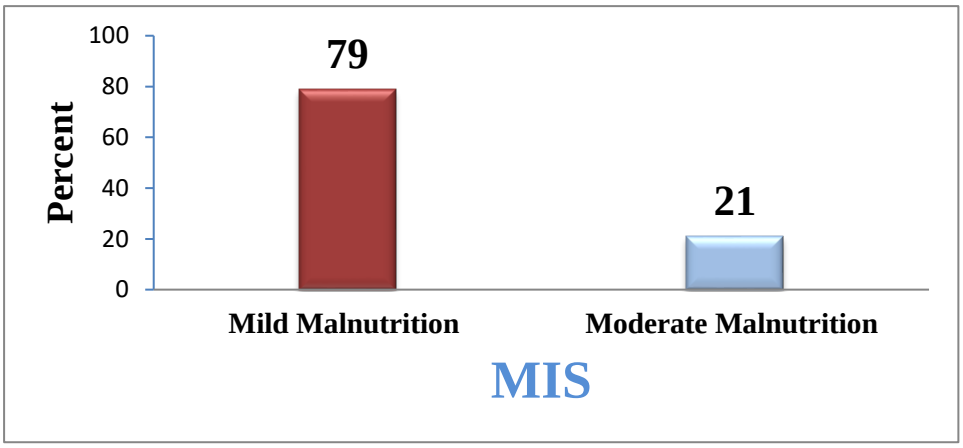

Diagram 2: Assessment of study sample as regards Malnutrition inflammation score

Table 6: Assessment of study sample as regards QOL (PCS &MCS& Total Score)

QOL Score		Study sample (n = 100)
PCS	Mean± SD Range	48.57 ± 23.85 0 -100
MCS	Mean± SD Range	**57.08 ± 21.27** **5 -100**
Total Score	Mean± SD Range	**53.67 ± 20.08** **3 -100**

Table 7: Correlation between Malnutrition inflammation score (MIS) with Socio demographic & Clinical data:

		Socio demographic & Clinical data					
		Age (N=100)	Body Mass Index (N=100)	Systolic Blood Pressure (N=100)	Diastolic Blood Pressure (N=100)	Dialysis Vintage /Month (N=100)	Dry Weight (N=100)
MIS	Pearson Correlation (r)	.222	-.009	.072	.031	.248	-.04
	P	.027*	.928	.479	.757	.013*	.694

*; statistical significant

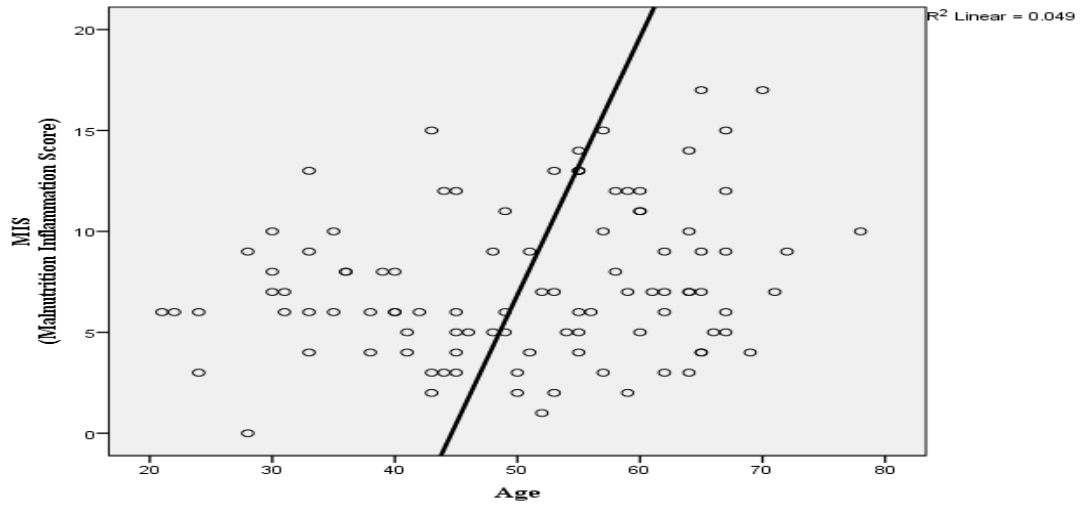

Diagram3: Correlation between Malnutrition inflammation score (MIS) with age

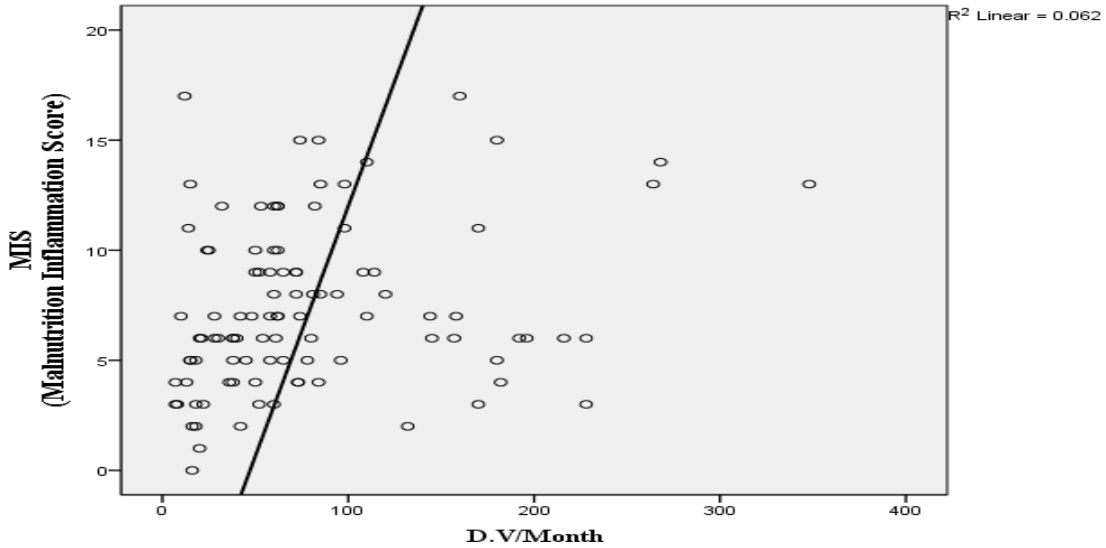

Diagram4: Correlation between Malnutrition inflammation score (MIS) with D.V/Month

Table 8: Correlation between Malnutrition inflammation score (MIS) with Investigations

Investigations	**MIS**	
	Pearson Correlation (r)	**P**
CRP (mg/ml)	0.110	0.274
Albumin (g/dl)	-.080	0.429
Urea Reduction Ratio (%)	0.021	0.836
Hemoglobin (g/dl)	-0.021	0.835
Total Iron Binding Capacity (mg/dl)	-0.226	0.023*
Ferritin (ng/ml)	0.117	0.248
Cholesterol (mg/dl)	0.044	0.663
Triglyceride (mg/dl)	-0.129	0.202
HDL Cholesterol (mg/dl)	0.171	0.088
LDL Cholesterol (mg/dl)	0.061	0.547

*: statistical significant

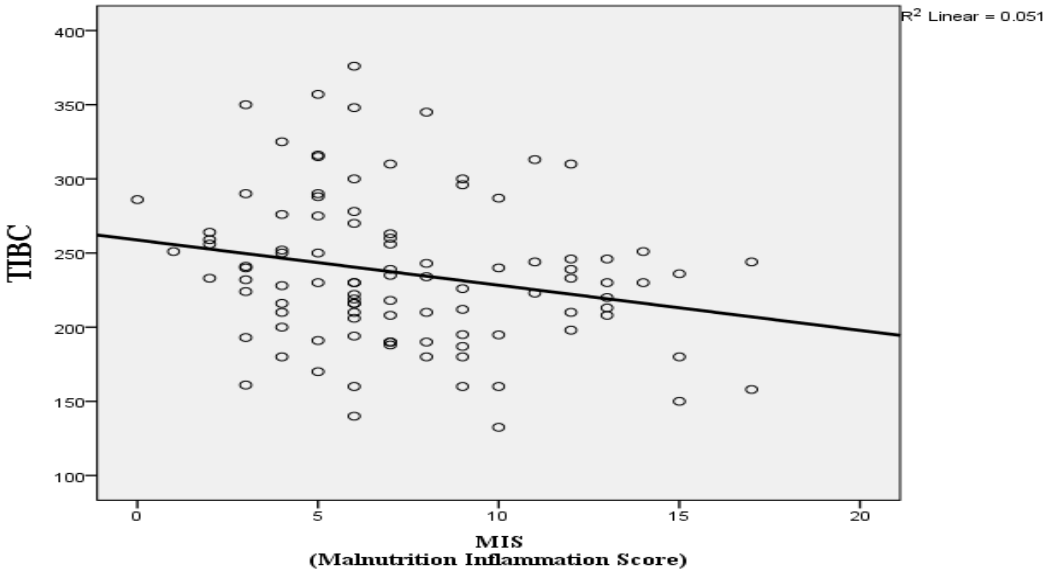

Diagram5: Correlation between Malnutrition inflammation score (MIS) with TIBC

Table 9: Correlation between QOL with Sociodemographic & Clinical data

		Socio demographic & Clinical data					
		Age (N=100)	BMI (N=100)	SBP (N=100)	DBP (N=100)	D.V/Month (N=100)	Dry Wt. (N=100)
PCS	Pearson Correlation (r)	-.196	-.223	-.138	-.082	-.023	-.201
	P	.05*	.026*	.17	.42	.818	.045*
MCS	Pearson Correlation (r)	-.049	-.141	.122	.083	.010	-.045
	P	.629	.163	.226	.409	.92	.656
Total Score	Pearson Correlation (r)	-.126	-.194	.015	.017	-.003	-.122
	P	.213	.053	.883	.866	.977	.225

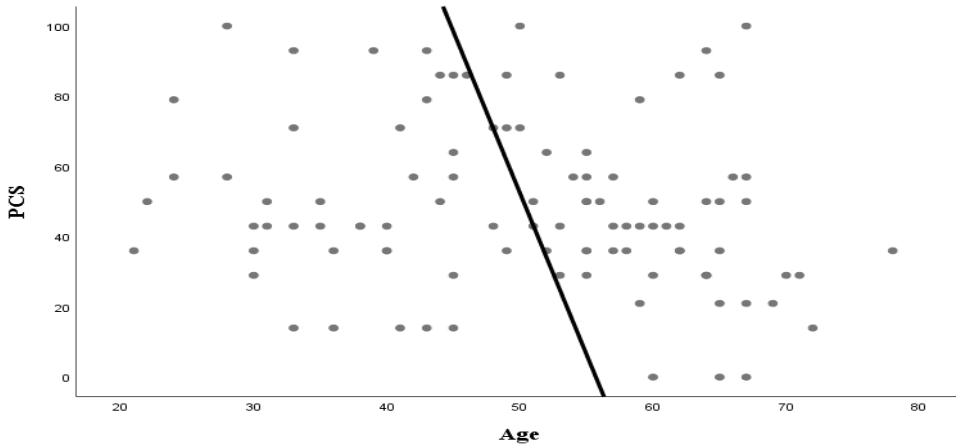

Diagram 6: Correlation between PCS and Age

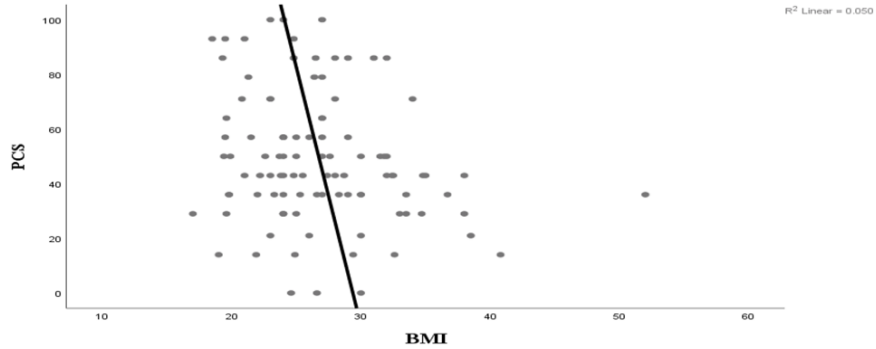

Diagram7: Correlation between PCS and BMI

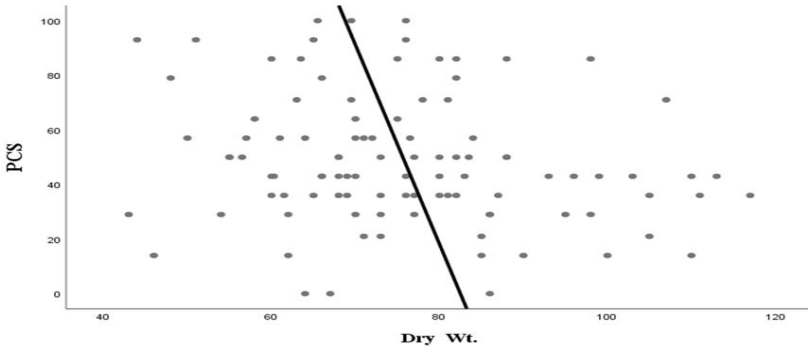

Diagram8: Correlation between PCS and dry weight

Table10: Relation between QOL Components with sex

	Study sample		Test of significance (p)
	Male (N=60)	**Females (N=40)**	
PCS			
Mean ± SD	54.9± 24.5	39± 19.36	(t= 3.4 , P=0.001*)
MCS			
Mean ± SD	62.8± 20.8	48.48± 19.04	(t= 3.4 , P=0.001*)
Total Score			
Mean ± SD	59.65± 20.2	44.7± 16.44	(t= 3.9 ,P=0.0001*)

t: independent t test *; statistical significant

Table 11: Relation between MIS categories and SF12V1 subscales

QOL	MIS		Test of significance (p)
	Mild Malnutrition (N=79)	Moderate Malnutrition (N=21)	
PCS			
Mean ± SD	52.6 ± 23.5	33.38 ± 18.77	(t= 3.5 , P=0.001*)
MCS			
Mean ± SD	60.7 ± 20.6	43.38 ± 18.14	(t= 3.5 , P=0.001*)
Total QOL Score			
Mean ± SD	57.47 ± 19.38	39.38 ± 16.14	(t= 3.9, P=0.0001*)

Table 12: Univariate analysis to assess the effect of MIS on PCS of SF12v1

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Constant	72.046	4.619		15.599	.0001*	62.880	81.211
MIS	-3.177	.558	-.498	-5.691	.0001*	-4.284	-2.069

Dependent Variable: PCS

Table 13: Univariate analysis to assess the effect of MIS on MCS of SF12v1

Model 2	Unstandardized Coefficients		Standardized Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Constant	77.979	4.125		18.906	.0001*	69.795	86.164
MIS	-2.828	.498	-.497	-5.674	.0001*	-3.817	-1.839

Dependent Variable: MCS

Table 14: Univariate analysis to assess the effect of MIS on Total Score of QoL

Model3	Unstandardized Coefficients		Standardized Coefficients	t	Sig	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
Constant	75.631	3.737		20.239	.0001*	68.215	83.047
MIS	-2.972	.452	-.554	-6.580	.0001*	-3.868	-2.075

Dependent Variable: Total score

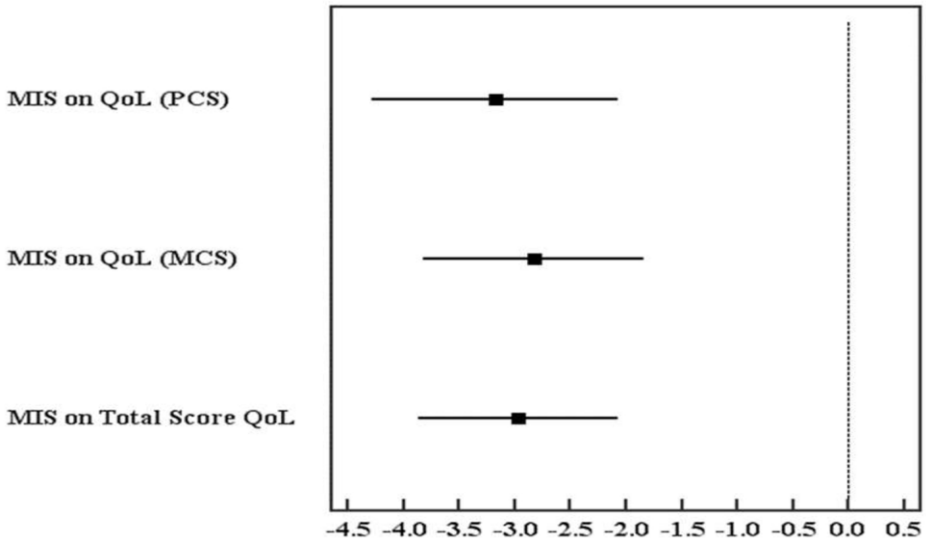

Diagram 9: Univariate analysis to assess the effect of MIS on QOL

- Patients' MIS was highly statistically significant in predicting PCS as the model explained (24.8%) of variability in PCS of QOL of patients, as each increase in MIS led to a significant decrease in PCS by 3.17 as (b,t,p) = (3.17,-5.69,.0001), respectively.
- Patients' MIS was also highly statistically significant in affecting MCS as the model explained (24.7%) of variability in MCS of QOL of patients, as each increase in MIS led to a significant decrease in MCS by 2.8 as (b,t,p) = (2.8,-5.67,.0001) respectively.

- Additionally, Patients' MIS was highly statistically significant in affecting the total score, as the model explained (30.6%) of variability in the total score of QOL of patients, as each increase in MIS led to a significant decrease in the total score of QOL by 2.97 as (b,t,p) = (2.97,-6.58,.0001) respectively.

DISCUSSION:

Our study was carried out on 100 patients referred to Damanhur Medical National Institute. Their mean age was (50.4 ± 13.2) years ranged from 21 to78 years. Majority of cases was males (60%) while (40%) were females. Their mean BMI was (26.8 ±5.7) ranged from 17 to 52. Majority of cases was nonsmoker (74 %) while only (26%) were smokers. (Table 3).

(Table 3 and diagram 1) illustrate the distribution of study sample according to associated comorbid diseases as (74%) suffered from HTN, (10%) had DM while (5%) had stroke, 19% had IHD and 5% had PAD.

Regarding to clinical examination, the distribution of our study sample is illustrated in table 4 showed that the mean of systolic blood pressure was (144.1mmHg ±20.7) while of diastolic was (88.6 mmHg ±12.5). Dialysis vintage per month mean was (79.7±66.3) and this of the dry weight was (75.8Kg ±16.3).

The means of investigations done like CRP, albumin, URR, Hg, TIBC, ferritin, were (11.5±11.8), (4±0.45), (69.3±10.8), (11.12±8.3), (236.3±50.3), (522.98±493.7) respectively while the means of lipid profile as cholesterol, triglycerides, HDL, LDL were (178.4±45.6), (156.7±100.6), (37.1±11.13), (110.6±36.4) respectively. (Table 5)

Among the study group, 79% had mild malnutrition, while 21% had moderate malnutrition (Table 5) (Diagram2).

The mean of (PCS) was (48.57 with SD ± 23.85), the mean of (MCS) was (57.08 with SD ± 21.27) while the mean of the total score was (53.67 with SD ± 20.08). (Table 6)

MIS has been found to be positively correlated with age and dialysis vintage with (r=.222, p=.027), (r=.248, p=.013), respectively. (Table 7) (Diagram 3 and 4 respectively), while malnutrition rates across men and women were not statistically different, which aligns with Behrooz et al.[20] as well as the study of Luciana et al., where 162 women were found to have higher MIS than 274 men [21].

As TIBC is one of the MIS components that is inversely scored, there is also a statistically significant negative correlation between MIS and TIBC (r=-0.226 and p=0.023) (Table 8) (Diagram5).

In our study, blood cholesterol and triglyceride levels were not found to be associated with MIS (Table 8), which is compatible with the findings of the Behrooz study [20] and it may be accepted because in dialysis patients due to endocrine disorders, increased lipid profile is common[22].

There was also significant negative correlation between PCS and age as (r=-0.196, p=.05), BMI (r= -0.223, P=.026) and dry weight (r= -0.201, p=.045) (Table 9) (Digram6, 7 and 8 respectively).

Female HD patients had significantly lower MCS, PCS and total scores than male HD patients with the means among males PCS (54.9± 24.5), MCS (62.8± 20.8), total score: (59.65± 20.2), while among female were PCS (39± 19.36), MCS (48.48± 19.04), TOTAL SCORE (44.7± 16.44). (Table 10), *Weiss et al*[23] revealed a preference for the male gender with a significant p-value regarding different

dimensions of SF-12, which is consistent with our findings. In contrast, females had higher scores in *Bayoumi et al.*[24]. There may be a connection between the numerous research contradictory findings and treatment effectiveness and the standard of care received.

There was a significant negative correlation between MIS and PCS as (r= -.498, p=.0001), as well with MCS (r= -.497, p=.0001) and also with total score (r= -.554, p=.0001). As illustrated in Table (11), the means of each SF-12 subscale were significantly higher in patients with mild malnutrition than in those with moderate malnutrition. Our findings align with those of Rambod and colleagues [25], who found that the SF-36 questionnaire demonstrated negative relationships between MIS and all dimensions of QOL. Consistent with our study, *Sohrabi Z et al.* [26] used the SF-12 questionnaire and found that individuals with severe malnutrition had a lower QOL (mentally and physically) than those with mild to moderate malnutrition. In HD patients, QOL is a significant predictor of survival. [9]. consequently, the link between QOL and MIS or SGA score focuses on the impact of malnutrition-inflammation on HD patients' survival rates.

Using regression analysis (multiple regression with univariate analysis) with MIS as a predictor, the effect of MIS on QOL (PCS &MCS& Total Score) (Table 12, 13 and 14) (Diagram 9) was assessed and found to be highly statistically significant. Interestingly, the MIS is substantially associated with all eleven [13] QOL dimensions specific to kidney disease [5] Patients with HD were found to be more likely to have poor QOL (SF-36 questionnaire) and bad sleep disorders if they also had MIS [27] *Bandeira and colleagues* recently found MIS to be a valuable tool for assessing the nutritional condition of dialysis patients, and it also can predict adverse clinical outcomes [28] which is consistent with our findings.

Conclusion:

Our patients' MIS had a significant negative correlation with PCS, MCS, and the total SF12v1 score. MIS of patients was highly statistically significant in predicting PCS, MCS, and the total SF12v1 score, and each increase in MIS was associated with a significant decrease in PCS, MCS, and the total SF12v1 score.

Practical Application:

MIS was a good predictor of QOL depending on SF12v1, with easy applicability of both among dialysis patients. Further studies are needed in cases where patients' nutritional status is promptly assessed to determine if early educational and behavioral intervention can improve their outcomes.

Authors' contributions:

All of the authors were involved in the research's design. As a group, AHA, WAB, OMM, and NMR worked together to analyze and interpret data. The initial draught was prepared by WNE. It was AHA, WAB and NMR's job to revise the first version. The final version of the manuscript was approved by all of the writers.

Ethical considerations:

The authors have taken care to avoid any ethical disruption (such as plagiarism, data manipulation, or multiple publications) at all costs.

Limitation of the Study: The study follows a cross-sectional design, includes a relatively small sample size and is influenced by substantial residual confounding

Conflicts of Interest: The authors state that the publishing of this paper is free of any conflicts of interest.

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REFERENCES:

1. Kaze FF, Ashuntantang G, Kengne AP, et al. Acute hemodialysis complications in end-stage renal disease patients: the burden and implications for the under-resourced Sub-Saharan African health systems. Hemodial Int. 2012;16(4):526-531.
2. Sreejitha N, Devi K, Deepa M. The quality of life of patients on maintenance hemodialysis and those who underwent renal transplantation. Amrita J Med. 2012;8:1-44.
3. Montinaro V, Iaffaldano GP, Granata S, et al. Emotional symptoms, quality of life and cytokine profile in hemodialysis patients. Clin Nephrol. 2010;73(1):36-43.
4. de Roij van Zuijdewijn CL, ter Wee PM, Chapdelaine I, et al. A Comparison of 8 Nutrition-Related Tests to Predict Mortality in Hemodialysis Patients. J Ren Nutr. 2015;25(5):412-419.
5. de Roij van Zuijdewijn CL, Grooteman MP, Bots ML, et al. Comparing Tests Assessing Protein-Energy Wasting: Relation With Quality of Life. J Ren Nutr. 2016;26(2):111-117.
6. Beddhu S, Baird BC, Zitterkoph J, et al. Physical activity and mortality in chronic kidney disease (NHANES III). Clin J Am Soc Nephrol. 2009;4(12):1901-1906.
7. Johansen KL, Chertow GM, Ng AV, et al. Physical activity levels in patients on hemodialysis and healthy sedentary controls. Kidney Int. 2000;57(6):2564-2570.
8. Perales-Montilla CM, García-León A, Reyes-del Paso GA. Psychosocial predictors of the quality of life of chronic renal failure patients undergoing haemodialysis. Nefrologia. 2012;32(5):622-630.
9. Mapes DL, Lopes AA, Satayathum S, et al. Health-related quality of life as a predictor of mortality and hospitalization: the Dialysis Outcomes and Practice Patterns Study (DOPPS). Kidney Int. 2003; 64(1): 339-349.
10. Obrador GT. Epidemiology of chronic kidney disease. Uptodate. Error! Hyperlink reference not valid.. Published 2016. Accessed Nov, 2020.
11. Kamyar Kalantar-Zadeh, Joel D Kopple, Gladys Block, et al. A malnutrition-inflammation score is correlated with mortality in maintenance hemodialysis patients. American Journal of Kidney Diseases. April 2001: 37(4) DOI: 10.1016/ S0272-6386(01)80185-2
12. Peter Hagell and Westergren Albert Measurement Properties of the SF-12 Health Survey in Parkinson's Disease. Journal of Parkinson's Disease. January 2011. 1(2): 185-96.DOI: 10.3233/JPD-2011-11026
13. As'habi A, Tabibi H, Nozary-Heshmati B, et al. Comparison of various scoring methods for the diagnosis of protein-energy wasting in hemodialysis patients. Int Urol Nephrol. 2014;46(5):999-1004.
14. Ho LC, Wang HH, Chiang CK, et al. Malnutrition-inflammation score independently determined cardiovascular and infection risk in peritoneal dialysis patients. Blood Purif. 2010;29(3):308-316.
15. Gandek B, Ware JE, Aaronson NK, et al. Cross-validation of item selection and scoring for the SF-12 Health Survey in nine countries: results from the IQOLA Project. International Quality of Life Assessment. J Clin Epidemiol. 1998;51(11):1171-1178.
16. El-Kalla RA, Khalaf MM, Saad MA, et al. Reliability of the Arabic Egyptian Version of Short Form 36 Health Survey Questionnaire to Measure Quality of Life in Burned Patient. Med J Cairo Univ. 2016; 84(2):311-316.
17. Jayasinghe UW, Proudfoot J, Barton CA, et al. Quality of life of Australian chronically-ill adults: patient and practice

characteristics matter. Health Qual Life Outcomes. 2009;7:50.

18. Loosman WL, Hoekstra T, van Dijk S, et al. Short-Form 12 or Short-Form 36 to measure quality-of-life changes in dialysis patients? Nephrol Dial Transplant. 2015;30(7):1170-1176.
19. Chan YH. Biostatistics 104: correlational analysis. Singapore Med J. 2003;44(12):614-619.
20. Behrooz E, Atamohammad D, Gharavi YA. Malnutrition-inflammation score in hemodialysis patients. Zahedan J Res Med Sci. 2014;16(8):25-28.
21. Silva LF, Matos CM, Lopes GB, et al. Handgrip strength as a simple indicator of possible malnutrition and inflammation in men and women on maintenance hemodialysis. J Ren Nutr. 2011;21(3):235-245.
22. Renee de Mutsert, Diana C Grootendorst, Elisabeth W Boeschoten. Subjective global assessment of nutritional status is strongly associated with mortality in chronic dialysis patients. *Am J Clin Nutr 2006; 83(2): 202-210*.
23. Weiss M, Mettang T, Tschulena U, et al. Health-related quality of life in haemodialysis patients suffering from chronic itch: results from GEHIS (German Epidemiology Haemodialysis Itch Study). Qual Life Res. 2016;25(12):3097-3106.
24. Bayoumi M, Al Harbi A, Al Suwaida A, et al. Predictors of quality of life in hemodialysis patients. Saudi J Kidney Dis Transpl. 2013;24(2):254-259.
25. Rambod M, Bross R, Zitterkoph J, et al. Association of Malnutrition-Inflammation Score with quality of life and mortality in hemodialysis patients: a 5-year prospective cohort study. Am J Kidney Dis. 2009; 53(2):298-309.
26. Sohrabi Z, Eftekhari MH, Eskandari MH, et al. Malnutrition-inflammation score and quality of life in hemodialysis patients: is there any correlation? Nephrourol Mon. 2015; 7(3):e27445.
27. Bilgic A, Akgul A, Sezer S, et al. Nutritional status and depression, sleep disorder, and quality of life in hemodialysis patients. J Ren Nutr. 2007;17(6):381-388.
28. Brandão da Cunha Bandeira S, Cansanção K, Pereira de Paula T, et al. Evaluation of the prognostic significance of the malnutrition inflammation score in hemodialysis patients. Clin Nutr ESPEN. 2020;35:109-115.

تقييم الحالة التغذوية لدى مرضى غسيل الكلى السائد وتأثيرها على جودة الحياة

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يعاني المرضى الذين يخضعون لغسيل الكلى في كثير من الأحيان من سوء التغذية وانخفاض جودة الحياة والتي يمكن أن يكون لها عواقب وخيمة مثل زيادة خطر دخول المستشفى والوفاة. تم تحديد كلاهما مؤخرًا على أنهما هدفان مهمان لكفاية غسيل الكلى

الهدف: هدفنا هو تحديد ما إذا كانت هناك علاقة بين الحالة التغذوية وجودة الحياة مرضى غسيل الكلى لدينا

المرضى والطرق: في المعهد الوطني الطبي بدمنهور ، أجريت دراسة مستعرضة على ١٠٠ مريض خضعوا لغسيل الكلى المنتظم ، وحددنا الارتباط باستخدام اختبار ارتباط بيرسون بعد تقييم الحالة التغذوية مع درجة التهاب سوء التغذيةو جودة الحياة بالنسخة العربية الصحيحة. من النموذج القصير ١٢ من الاستبيان الإصدار ١ لتحديد الارتباط باستخدام اختبار ارتباط بيرسون. بالإضافة إلى ذلك ، تم استخدام التحليل أحادي المتغير لتقييم درجة تأثير التهاب نتيجة سوء التغذية على مكونات الاستبيان ذات الشكل القصير ١٢.

النتائج: كان لنتيجة التهاب سوء التغذية ارتباط سلبي معنوي بمكونات النسخة ١ من الاستبيان ذات الشكل المختصر ١٢ فيما يتعلق بملخص المكون المادي وكذلك ملخص المكون العقلي واجمالي درجات جودة الحياة وكانت نتيجة التهاب سوء التغذية لدى المرضى ذات دلالة احصائية عالية في التنبؤ بالمكونات المادية كما اوضح النموذج من التباين فى المكون المادي لجودة حياة المرضى حيث ادت كل زيادة فى درجة التهاب سوء التغية الى انخفاض كبير فى المكون المادي

الخلاصة: من بين مرضانا ، كان لنتيجة التهاب سوء التغذية ارتباط سلبي معنوي بملخص المكون المادي، وملخص المكون العقلي ، وإجمالي النتيجة القصيرة للإصدار الأول من الاستبيان ١٢. كانت نتائج التهاب سوء التغذية لدى المرضى ذات دلالة إحصائية عالية في التنبؤ بملخص المكون المادي، وملخص المكون العقلي ، والنتيجة الإجمالية للإصدار القصير من الاستبيان ١٢.