

Functional Health Status for Patient undergoing Hemodialysis

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Abstract

Background: Patients with chronic kidney disease are characterized by low levels of physical functioning, which, along with low biopsychosocial Functional activity, predict poor outcomes in those treated with hemodialysis. **Aim:** To assess of functional health status for patients undergoing hemodialysis. Design: Descriptive research design. **Setting:** Hemodialysis unit at Om-Alkosur University Hospital. **Sample:** A purposive sample of 100 adult patients. **Tools (1):** Personal characteristics and medical data and (2): Biopsychosocial functional health status assessment sheet which composed of 3 parts; I. physical, II. psychological and III. social health status. Results: Majority of the studied patients had a partially physical function, a moderate psychological function, mild social function and totally had warning zoon. There was no statistically significant difference between totally biopsychosocial Functional and their demographic and clinical data there was statistically significant difference except regarding residence and duration of dialysis (0.002 and 0.001 respectively). **Conclusion and Recommendations:** Functional health impairment is a major obstacle among hemodialysis patients. There is need for collaborative approach to improve function health status for patients undergoing hemodialysis.

Keywords: *Functional Health Status & Hemodialysis*

Introduction

Functional status (FS) is the ability to perform activities such as walking, bathing, dressing, getting out of bed, and using the toilet . Is a key aspect of the quality of life, a strong predictor of survival , a determinant of caregiving needs health care costs, and a factor in decisions about medical procedures such as the use of feeding tubes or cardiopulmonary resuscitation (**Forman et al., 2017**).

Disability, or functional dependence, is a well-recognized predictor of hospitalization and of poor outcomes in non-dialysis populations but has not been well studied in the renal population . Previous research has suggested that renal patients are vulnerable and often cannot function fully within society, however, few have characterized , in detail, the nature and type of disabilities seen, particularly among dialytic patients (**Zhang et al., 2018**).

Chronic renal disease is defined as "long-term kidney impairment that can worsen over time." If the damage is severe, dialysis or a kidney transplant may be required in order to live. When the kidneys cease working, this is known as renal failure (**Liu et al., 2018**). Dialysis is a process that involves pumping blood through a machine that filters waste and restores it to the body. Dialysis and peritoneal dialysis are two different forms of dialysis (**Byrne, 2020**).

Hemodialysis is a therapy that filters wastes and water from the blood in the same way as healthy

kidneys do. Hemodialysis aids in the management of blood pressure and the balance of essential minerals in the blood, such as potassium, sodium, and calcium (**Salani et al., 2018**).

Suggestions to health care professionals, self-care during hemodialysis, information searching, use of alternative therapies, selective symptom management, aggressive self advocacy, and management of shared role functions are the eight elements of self-management in patients undergoing hemodialysis (**Mahjubian et al., 2018**).

Self-management behavior and understanding of their condition/treatment may have an influence on their functioning and well-being. Patients on hemodialysis have employed cooperative/participative and protective/proactive methods as self-management strategies (**Bahraminejad, 2018**).

Significant of study

From research experience as head nurse in hemodialysis unit for ten years and according to Ome Alkosur University Hospital at Manfalout City, records for year 2018 the number of hemodialysis patients 107, the number of hemodialysis patients records in year 2019 [126] patients.

From my experience and previous studies, patients with hemodialysis have several problems in functional health status lead to clinical outcomes resulting in death and different complications such as

feeling of anxiety ,frustration, and uncontrolled of life issues.

Aim of the study

The present study was carried out to assess of functional health status for patients undergoing hemodialysis

Research questions

What are functional Health Status for patients undergoing hemodialysis?

Operational definition

Functional Health Status:

A measure of a patient's capacity to do common physical and social psychological tasks and functions on a day-to-day basis.

Patients and Method

Research design:

This research used a descriptive research design.

Technical design:

Research setting:

The study was conducted in hemodialysis unit at Ome-Alkosur University Hospital. Hemodialysis unit consisted of 30 beds, 126 patients and 4 sector and also it serves the biggest region of the population from both rural and urban areas.

Subject:

A purposive subject of 100 adults patient male and female, their age ranged from 20-65 years undergoing hemodialysis and agreed to participate in the study were assessed using the following tools

Inclusion criteria

Adults Patient male and female, their age ranged from 20-65 years undergoing hemodialysis

Exclusion criteria

Peritoneal dialysis patient

Tools:

Two tools were utilized in this study:

Tool (1): Personal characteristics and medical data: This tool was developed by a researcher. Age, gender, marital status, telephone number, medical and readmission history, reason for admission main complaint, general health evaluation, risk factors, and clinical symptoms are among the items included.

Tool (2): Biopsychosocial functional health status assessment sheet was adopted from Duk activit status index [Hlaky et al ,1989], it is composed of 3 parts .

Part (I): Physical health Status Included 14 questions: such as the patient's capacity or limits to do everyday activities like (bathing , dressing , personal grooming ,eating , transferring , toileting , continence , ambulation). It has 14 questions with a total score of 42. Scores ranging from 28 to 42 were deemed independent for statistical reasons; scores ranging from 14 to less than 28 were considered somewhat dependent.

Part (II): Psychological health status Included 7 questions such as: suffering indicatins or symptoms of psychological health discomfort as a result of the illness process, such as worry, frustration, and life concerns that are out of control It consisted of seven questions with a total score of seven, including mild psychological discomfort (scores of 0 to 3), moderate psychological distress (scores of 3 to 5), and severe psychological distress (scores of 5 to 7).

Part (III): Social health status included 7questions such as: ability or inability to keep a social role, relationships, visits, and social activities. It may be used to test for problems and follow the patient over time using social and role functions. It was divided into three categories: mild social dysfunction [0 to 3]; moderate social dysfunction [3 to 5]; and severe social dysfunction [6 to 10]. Moderate social dysfunction (scores of 3 to 5) and severe social dysfunction (scores of 5 to 7) .

Ethical approval:

Permission to carry out the study was obtained from the ethical committee of the Faculty of Nursing. Verbal consent was obtained from each patient prior to his/her contribution in the present study, after explaining the nature and purposes of the study. Confidentiality and anonymity assured. The researcher emphasized that the participation was voluntary and the patients had the right to refuse to participate in the study and can withdraw at any time.

Face validity and reliability

- A jury of (5) experts (specialists in the field of medical-surgical nursing) from Assiut University evaluated the tool's validity, forming views on the tool's format arrangement, consistency, knowledge correctness, relevance, and competence.
- Tool's reliability refers to the degree of consistency with which the instrument measures the thing it is supposed to be measuring Reliability of tool was confirmed by Alpha Cronbach test (0.75).

Field of work

The study was carried out in the following steps:

- A written permission to conduct the study was obtained from the research committee in faculty of Nursing , Assiut university .
- The dean of the nursing faculty provided an official permission letter.
- An official approval for data collection was obtained from administrators of the selected hospital .
- The research was conducted during morning and afternoon shifts.
- At the outset of the interview, the researcher introduced herself in order to establish a line of contact

- The patients' consent for voluntary participation was acquired, and the study's goal and nature were described
- The researcher used text books, papers, and scientific periodicals to review the relevant local and worldwide literature for the current investigation
- Using Tool (I), the researcher obtains baseline data from the patients.
- The data, which was acquired using the aforementioned techniques, was treated with the utmost secrecy and anonymity.

Data were collected during the period from 1/6 /2020 to 31/12/2020.

A pilot study

- A pilot study was conducted on 10% of the sample (10 patients) to evaluate the applicability, feasibility and clarity of tool was done.
- The researchers meet with each patient individually and assess the patients status by checking presence or absence of each item of the head to toe

assessment, an informed consent was obtained for voluntary participation.

- Assessment of Biopsychosocial functional health status using Tool (II). This was used for assessing (physical, psychological and social health function).
- This tool was filled by the researcher after asking the patients (through the face to face interview) on the hemodialysis machine.

Statistical design

SPSS version 16 for Windows was used to enter and analyze data. Chi-square analysis was performed to construct the health status function, and Pearson's formula was employed to assess statistical significance of differences across variables, with a p-value of 0.05 considered significant. Using a reference compliance rate of 38%, 5% variability, and a 5% alpha value, a post hoc power calculation revealed that the research had a power of 90%.

Results:

Table (1): Percentage distribution of the studied sample according to socio-demographic characteristics (n.100)

Demographic characteristics		n.	%
Age groups	• 20<40	44	44.0
	• 40-60	44	44.0
	• >60	12	12.0
Mean ± SD		43.94 ±15.69	
Gender	• Male	53	53.0
	• Female	47	47.0
Marital status	• Single	22	22.0
	• Married	66	66.0
	• Divorce	9	9.0
	• Widow	3	3.0
Occupation	• Un employee	16	16.0
	• Employee	42	42.0
	• Student	37	37.0
	• House wife	5	5.0
Level of education	• Illiterate	36	36.0
	• Read and write	8	8.0
	• Primary/ preparatory	14	14.0
	• Secondary	32	32.0
	• Higher educated	10	10.0
Residence	• Urban	13	13.0
	• Rural	87	87.0

Table (2): Percentage distribution of medical data of the studied patients (n. 100)

Medical data		n.	%
Duration of disease	1-3years	10	10.0
	3-5years	88	88.0
	>5years	2	2.0
Mean \pm SD	6.67 \pm 3.33		
Hours	4-5 hours	43	43.0
	>5 hours	57	57.0
Type of fistula	Fistula	96	96.0
	Graft	4	4.0
History of chronic diseases	No history of chronic disease	17	17.0
	Diabetes Mellitus	7	7.0
	Hypertension	45	45.0
	HF	11	11.0
	Cancer	2	2.0
	High cholesterol	11	11.0
	DM & hypertension	5	5.0
	Hypertension and cancer	2	2.0
Medication	Yes	12	12.0
	No	88	88.0
Family history	Yes	24	24.0
	No	76	76.0
Weight before dialysis	62.9 \pm 9.12		
Wright after dialysis	62.6 \pm 9.7		

HF: Heart Failure

DM: Diabetes Mellitus

Table (3): Frequent distribution of physical function assessment of the studied patients (n.=100)

Physical	Partially dependent		Independent		Dependent	
	n.	%	n.	%	n.	%
1. Taking care of yourself, that is, eating?	2	2.0	96	96.0	2	2.0
2. Moving in and out of a bed or chair?	2	2.0	94	94.0	4	4.0
3. Walking indoors, such as around your home?	13	13.0	83	83.0	4	4.0
4. Walking several blocks?	22	22.0	61	61.0	17	17.0
5. Walking one block or climbing one flight of stairs?	35	35.0	51	51.0	14	14.0
6. Doing work around the house such as cleaning, light yard work, home maintenance?	43	43.0	57	57.0	0	0.0
7. Doing errands, such as grocery shopping?	35	35.0	61	61.0	4	4.0
8. Driving a car or using public transportation?	35	35.0	61	61.0	4	4.0
9. Doing vigorous activities such as running, lifting heavy objects or participating in strenuous sports?	20	20.0	47	47.0	33	33.0
10. The ability to bathe and groom oneself and to maintaining dental hygiene, nail and hair care.	13	13.0	53	53.0	34	34.0
11. Continence: The ability to control bladder and bowel function	41	41.0	57	57.0	2	2.0
12. Toileting: The ability to get to and from the toilet, using it appropriately, and cleaning oneself.	0	0.0	100	100.0	0	0.0
13. Housecleaning and home maintenance. Cleaning kitchens after eating, maintaining living areas reasonably clean and tidy, and keeping up with home maintenance.	30	30.0	63	63.0	7	7.0
14. Worked your regular number of hours?	66	66.0	25	25.0	9	9.0
Total	72	72.0	28	28.0	0	0.0

Table (4): Frequent distribution of psychological function assessment the studied patients (n. =100)

Psychological	Mild psychological distress		Moderate psychological distress		Sever psychological distress	
	n.	%	n.	%	n.	%
1. Have you been a very nervous person?	0	0.0	100	100.0	0	0.0
2. Have you felt calm and peaceful?	0	0.0	88	88.0	12	12.0
3. Have you felt downhearted and blue?	0	0.0	31	31.0	69	69.0
4. Were you a happy person?	2	2.0	15	15.0	83	83.0
5. Did you feel so down in the dumps that nothing could cheer you up	2	2.0	66	66.0	32	32.0
6. Did you feel of anxiety?	2	2.0	51	51.0	47	47.0
7. Did you feel frustrated	19		76	76.0	5	5.0
Total						
Mean±SD	3.27±1.12					

Table (5): Frequent distribution of social function assessment of the studied patients (n.=100)

Social	Mild social dysfunction		Moderate social dysfunction		Sever social dysfunction	
	n.	%	n.	%	n.	%
1. Had difficulty visiting with relatives or friends?	77	77.0	2	2.0	21	21.0
2. Had difficulty participating in community activities as religious, social activities	71	71.0	0	0.0	29	29.0
3. Had difficulty taking care of other people such as family members	67	67.0	2	2.0	31	31.0
4. Isolated yourself from people around you?	55	55.0	0	0.0	45	45.0
5. Acted affectionate toward others and irritable toward those around you?	77	77.0	0	0.0	23	23.0
6. Made unreasonable demands on your family and friends?	22	22.0	2	2.0	76	76.0
7. Gotten along well with other people?	60	60.0	0	0.0	40	40.0
Total	73	73.0	4	4.0	23	23.0
Mean±SD	2.73±2.39					

Table (6): Percentage distribution of Total bio psychological of the studied patients (n.=100)

Physical	Independent	Partially dependent	Dependent
	28	72	0
Mean±SD	22.27±7.18		
psychological	Mild psychological distress	Moderate psychological distress	Sever psychological distress
	28	72	0
Mean±SD	22.27±7.18		
Social	Mild social dysfunction	Moderate social dysfunction	Sever social dysfunction
	73	4	23
Mean±SD	2.73±2.39		
Totally	Warning Zoon		Good Zoon
	94		6
Mean±SD	28.2±8.75		

Table (7): Relation between totally biopsychosocial Functional assessment with demographic and clinical data

Demographic and clinical data		Totally biopsychosocial Functional		
		Warning Zoon	Good Zoon	P. value
Age groups	20<40	40	4	0.433
	40-60	42	2	
	>60	12	0	
sex	Male	51	2	0.283
	Female	43	4	
Marital status	Single	21	1	0.871
	Married	61	5	
	Divorce	9	0	
	Widow	3	0	
Occupation	Employee	41	1	0.154
	Farmer	33	4	
	house wife	4	1	
	not work	16	0	
Level of education	Educated	10	0	0.864
	Second	30	2	
	Read And Write	7	1	
	Illiterate	34	2	
	Student	13	1	
residence	Urban	9	4	0.002*
	Rural	85	2	
Duration	1-3years	8	2	0.001*
	3-5years	86	2	
	>5years	0	2	
Type Of Fistula	Fistula	90	6	0.778
	Graft	4	0	
DM	Yes	8	2	0.109
	No	86	4	
Hepatitis	Yes	54	2	0.232
	No	40	4	
Previous surgery	Yes	36	0	0.063
	No	58	6	
Medication	Yes	12	0	0.455
	No	82	6	
Family History	Yes	24	0	0.183
	No	70	6	
Condition	Good	27	0	0.150
	Fair	56	4	
	Poor	11	2	

Independent sample T-test

**Significant difference at $p < 0.01$

Table (1): Shows that the highest percentage of studied patients their ages ranged between 20-60 years old with mean age of 43.94 ± 15.69 years old, and the highest percentage of them were male, married. As regard to occupation level of education and residence, the majority of studied patients were employed, and illiterate and rural.

Table (2): Reflects that the highest percentage of studied patients their duration of haemodialysis from 3-5 with mean (6.67 ± 3.33 years) and 57% of patients treated for each hemodialysis > 5 hours. Regarding type of vascular access, majority of patients use fistula, and complain hypertension (45%,) majority

(88%) not receive medication and no family history (76%). The mean patient's weight was (62.9 ± 9.12) before the dialysis and (62.6 ± 9.7) after dialysis.

Table (3): Revealed that majority of the studied patients had a partially physical function (72%), with mean (22.27 ± 7.18).

Table (4): Revealed that majority of the studied patients had a moderate psychological function (72%) with mean (3.27 ± 1.12)

Table (5): Revealed that majority of the studied patients had a mild social function (73%) with mean (3.27 ± 1.12) mean (3.27 ± 1.12)

Table (6): Revealed that majority of the studied patients were partially physical dependent, moderate psychological distress, and mild social dysfunction. The table also, showed that (94%) of the studied patient had warning zoon.

Table (7): Showed that there was no statistically significant difference between totally biopsychosocial Functional and their demographic and clinical data except regarding residence and duration of dialysis (0.002 and 0.001 respectively)

Discussion

In patients with a limited life expectancy, dialysis may be started with the intention of alleviating symptoms and improving function. High rates of functional impairment have been reported among patients with ESRD. However, the trajectory of functional status during the transitional period from chronic kidney disease to ESRD is unclear, and to our knowledge, the effects of the initiation of dialysis on functional status have not been investigated (**Sumida & Kovesdy, 2017**).

The capacity to execute tasks such as walking, bathing, dressing, getting out of bed, and using the bathroom is referred to as functional status (Fs) (**Rehman, 2019**).

Regarding the demographic data, the highest percentage of studied patients their ages ranged between 20-60 years old .These findings supported by **Schmalz et al., (2020)** who reported similarly that age is associated with functional disability among hemodialysis patients

Regarding sex, the highest percentage of studied patients were male. This result was congruent with **Shakya et al., (2017)** who reported in their study that more than half of hemodialysis patients were males. Likewise similar to our results a study conducted by **Bae et al., (2018)** who revealed that slightly more than two thirds of patients were male and being male is consistently associated with poor functional health status. The researcher opinion that the majority of the studied patients were illiterate.

In relation to marital status, the present study revealed that the majority of studied patients were married . As regarding level of education, the highest percentage of studied patients were illiterate. This study finding was in line with a study conducted by **Xie et al., (2021)** which revealed that most hemodialysis patients were married and illiterate. The researcher opinion that majority were from rural area where the educational level is low.

Demirbag & Bulut, (2018) found that there was a significant statistical difference between patients who had a functional status instability and uneducated patients. This result agree with **Gamal et al., (2021)** who found that risk of functional disorders increase

among uneducated patients. This result disagree with **Malkani et al., (2020)** who found that urban residence and working patients were significantly associated with renal failure and functional complication.

According to occupation, the majority of the patients in this research were employed, according to the findings. As regarding residence, results from data collected in this study showed that the majority of studied patients were residents in rural areas and these findings supported by **Mahlangu et al., (2020)** who reported similarly that most of studied patients were residents in rural areas and employed. From researcher view, these patients have fatigue and exhaustion as a result from CRF that lead to functional status imbalance.

Regarding medical data, results from data collected in this study showed that the highest percentage of studied patients their duration of haemodialysis from three to five years and receiving and treated for each hemodialysis three to five hours. Regarding type of vascular access the majority of studied patients use arteriovenous fistula. **Wärme, (2021)** was in the same line as they mentioned in their study that their studied patients were received haemodialysis three days per week, four to five hours per session, and most of them used arteriovenous fistula. This result disagrees with **O'Hare et al., (2018)** who reported that three quarters of patients underwent hemodialysis treatment for more than 4 years.

As regarding presence of chronic diseases, the present study documented hypertension was present in majority of studied patients. **Karasneh et al., (2020)** were in the same line as they mentioned in their study that their studied patients (hemodialysis) were complained with kidney disease and hypertension. In the other hand, **Müller et al., (2020)** found that there was a significant statistical difference between functional health impairment and diabetes mellitus and smoking. This result agree with **Alexandrou et al., (2021)** They found that the odds of being unable to finish one rise without assistance were 1.5 times greater, and that the risks were significantly higher among individuals with diabetes.

The present study revealed that majority not receive medication and no family history. This match with **Mahlangu et al., (2020)** who revealed that patients are asked whether they have difficulty performing activity of daily living (ADLs), and basic mobility tasks with a family history. This not match with **Harhay et al., (2018)** who mentioned that no consistent patterns across walking ability categories were evident for smoking.

Regarding physical functional status: The current investigation discovered that all of the patients can care for themselves in terms of eating, dressing, washing, and toileting. Most of the patients in the study can move around the home, do minor housework like dusting or washing dishes, and walk a block or two on level ground, and their overall mean Duke activity score or status index (DASI) reflects this. In agreement with our results, CRF patients on hemodialysis were observed to have physical symptoms such as weariness, loss of energy, nausea, and cramps after dialysis, which were creating restrictions in daily activities, according to **Sihombing, et al., (2021)**.

Clarkson et al., (2019) are working on developing comprehensive physical functioning measurements (mobility and performance capacity and physical activity) found decrease in the dialysis patient's functional status specially physical condition. This confirmed by **Bridoux et al., (2017)** results who found that there was a highly statistically significance of the physical dysfunction and hemodialysis

The present study found that majority of the studied patients had a partially physical function In this line, **Soo et al., (2021)** Because the QOL survey's self-reported physical functioning score evaluates the amount of difficulty completing activities of daily living, instrumental activities of daily living, and more demanding tasks, it should be noted.

As regarding psychological functional status: The current study revealed that majority of the studied patients had a moderate psychological function According to **Haghighat et al., (2019)** who found that Patients undergoing hemodialysis exhibit similar levels of depression and anxiety.

In this respect, **Haramaki et al. (2019)** found that hemodialysis patients have a significant psychological burden, which they ascribe to the disease's constraints, which include hydration and food restrictions. Other stresses that contribute to this load, according to **Nerbass et al., (2017)**, are physical and cognitive disability, inability to comply to the treatment regimen, and reliance on others.

Psychological reasons, according to **Wassef et al., (2018)**, are the most prevalent obstacles to haemodialysis sessions, with lack of desire being the most common. **Hossain & Sitara (2020)** looked at the effects of psychosocial variables on behavioural compliance and survival in urban haemodialysis patients, as well as depression

Regarding Social functional status: The majority of the patients in this research had a mild social function. As a result , **Kiebalo et al. (2020)** advised that support has been progressively recognized as a key element that has a beneficial impact on the lives of hemodialysis patients as well as the disease's

outcome. Chronic kidney disease is a serious public health concern that causes substantial hardship to patients and their families, according to **Rysz et al., (2020)**.

To Several advancements have been achieved in comprehending hemodialysis therapy, according to **Tannor et al., (2019)**, however the need of social support for hemodialysis patients is slowly becoming recognized. Social support, in the view of the researcher, is clearly one of the most effective strategies to aid long-term treatment effectiveness and patients' adjustment sickness.

Also it may related to the studied patients the highest percentage of studied patients were low income status. These study findings were in line with a study conducted by **Saunders et al., (2020)** which revealed that People in the lowest socioeconomic quartile have a higher chance of developing CKD than those in the top.

In terms of patient-related variables, according to the researcher, our study findings indicated that the majority of the patients were illiterate. **Jang et al., (2020)**, who claimed that poor education and illiteracy have been proven to cause lower productivity, backed up this finding.

The same results was supported by **Daniel et al., (2021)** who investigated that the majority of patients reside distant from current dialysis clinics and must travel great distances to undergo dialysis, and many patients lack financial means, leading in dialysis inadequacy and frequent work interruptions, resulting in employment losses and social disruptions.

Totally, the present study revealed that the majority of the studied patients had warning zoon. **Shah et al., (2018)** study found that one fifth of the patients showed a decline in the functional status score. According to **Corsonello et al., (2018)**, patients with end-stage renal disease who are on maintenance hemodialysis have a low functional state.

The current study found that there was no statistically significant difference between totally biopsychosocial Functional and their demographic and clinical data except regarding residence and duration of dialysis. **Sheshadri et al., (2020)** showed that a cumulative prevalence of slow functional status among HD patients increased with age and was higher among women than among men **Huang et al., (2020)** tested the interaction of age and functional status by adding the interaction term, which was not significant. In the other hand, **Landi et al., (2018)** study confirmed that there were highly statistically positive correlations were found between functional status with and total socioeconomic factors with health care related

factors. Otherwise, there were found between therapy related factors with disease related factors with $p \leq 0.05$.

The researcher noted that younger age was associated with total functional status. This not match with **Ngamaba et al., (2017)** who noted that there were highly statistically positive correlations were found between economic status with total functional health status, the researcher found that patients with low income status were affect of the patient ability to perform the physical activities.

Conclusions :

Majority of the studied patients had a partially physical function, a moderate psychological function and mild social function and totally had warning zoon. There was no statistically significant difference between totally biopsychosocial Functional and their demographic and clinical data except regarding residence and duration of dialysis.

Recommendations:

Simple educational pamphlet for nurses' work in the hemodialysis unite about the functional health status. A routine assessment of functional health status of HD patients each session. Encourage hemodialysis patients to inform if they have trouble with ADLs and basic mobility activities. Referral of people with poor functional status to a professional for further assessment and treatment.

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