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Barriers of Adherence to Physiotherapy Treatment among Geriatric Patients in Matrouh, Egypt

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Abstract: **Poor adherence to physiotherapy treatment can have negative effects on health outcomes and healthcare cost. Little is known about barriers of adherence to physiotherapy treatment among geriatric patients. Identification of barriers may help gerontological/geriatric nurse to determine geriatric patients at risk of non-adherence and suggest methods to reduce the impact of those barriers thereby maximizing their level of adherence.** ***Research questions*****: Q1: What is the adherence level to physiotherapy treatment among geriatric patients in Matrouh, Egypt? Q2: What are barriers of adherence to physiotherapy treatment among geriatric patients in Matrouh, Egypt? Q3: Is there a relation between barriers factors and adherence level to physiotherapy treatment among geriatric patients in Matrouh, Egypt?** ***Methodology*****: This study was carried out at the out patients clinics of the physiotherapy center of Matrouh General Hospital. The subject composed of 215 geriatric patients who attended the previous mentioned setting for physiotherapy sessions for any medical or surgical conditions.** ***Results:*** **This study revealed that 71% of studied geriatric patients did not adhere to physiotherapy treatment. Mean scores of sever barriers identified were: physiotherapy related exercises make geriatric patients anxious & depressed was 2.74±0.56, poor knowledge related to physiotherapy exercises was 2.54±0.87, and physiotherapy center away from geriatric patients was 2.51±0.71. while, mean scores of mild barriers identified were: discouragement from family was 1.82±0.37 and not available time was 1.79±0.88. There was a high significant correlation between age, living arrangement, residence, educational level of studied geriatric patients with their adherence level at p value <0.01. There was a high negative predictor effect of the associated chronic diseases and using mobility aids on the level of adherence of studied geriatric patients to physiotherapy treatment at p value <0.01*****Conclusions:*** **This study concluded that, more than two thirds of studied geriatric patients did not adhere to physiotherapy treatment. The sever barriers affecting adherence of studied geriatric patients to physiotherapy treatment were; the anxiety and depression associated with physiotherapy related exercises, poor knowledge related to physiotherapy and its exercises, the physiotherapy center away from geriatric patients' place of residence and the patients' perceptions to physiotherapy treatment as very boring. There was a high negative correlation between presence of barriers and the adherence level of studied geriatric patients to physiotherapy treatment at p value <0.01.**

Keywords: **Adherence, Physiotherapy treatment, Barriers, Geriatric patients.**

I. INTRODUCTION

In Egypt, like much other countries worldwide, the elderly population is expanding. Aging is associated with many normal age-related changes such as; changes in bone density, reduced muscle strength and increased joint stiffness. These inevitable natural changes can affect older adults' mobility and put them at risk for falls and its consequences. On the other hand, older people may suffer from a wide range of chronic health issues including; diabetes mellitus, heart diseases, hypertension, stroke, chronic obstructive pulmonary diseases and musculoskeletal disorders as; arthritis and fractures. All of these illnesses can have a great impact on older adults' independence and quality of life ***(El-Moselhy, 2016), (Heldmann, Werner, Belala, Bauer & Hauer, 2019) & (Bonamassa, Troiano & Scafarto, 2020).***

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Physiotherapy has been proven by research to help older adults to maintain their health, well-being and functional ability leading to a better quality of life and continued independence. As it is involved in preventing diseases and disability, treating current health conditions, managing inpatient care and following up in the community. The benefits of physiotherapy treatment depend on patients' adherence and continued participation; however, a change in lifestyle to include regular physiotherapy regimens is difficult for many patients of all ages especially geriatric patients ***(Everink et al., 2018), (Heldmann, Werner, Belala, Bauer & Hauer, 2019) & (Moreno et al., 2019).***

The term of adherence has been defined as: "the extent to which a person's behavior corresponds with agreed recommendations from a healthcare provider". Within physiotherapy, the concept of adherence is multi-dimensional and could relate to attendance at appointments, following advice, undertaking prescribed exercises, frequency of undertaking prescribed exercise, correct performance of exercises or doing more or less than advised. Poor adherence to treatment has been identified across many healthcare disciplines including physiotherapy. Studies of exercise interventions in geriatric patients have demonstrated declining levels of adherence over time ***(Young, Moonie & Bungum, 2017), (Noon, Nwose & Breheny, 2019) & (Willett et al., 2019).***

Barriers of adherence to physiotherapy services can be discussed under two main categories, namely individual/personal and health system barriers. The individual/personal barriers are the barriers that pertain to the patients, comprising of background characteristics, economic, socio-cultural, mobility barriers and adherence levels ***(Skou, Pedersen, Abbott, Patterson & Barton, 2018)***. The health system barriers are those barriers that affect the service delivery system; it includes; human (attitudes of health care providers), physiotherapy modalities(exercise therapy, thermotherapy, electrotherapy, cryotherapy, and massage therapy), waiting time, and physical barriers (distance to the physiotherapy facility and wheelchair/walking aid accessibility). For geriatric patients, it is not clear which factors act as barriers to adherence to physiotherapy treatment ***(Palazzo et al., 2016) & (Hager et al., 2019).***

A gerontological nurse is a nursing specialist who works directly with older adults to provide them with specialized care and a high quality of life. A geriatric nurse is a specialist who will help elderly patients recover from illness or injury by providing practical care and developing patient care plans ***(Barker & Soh, 2018).*** They may also help with rehabilitation and conduct check-ups in skilled care facilities or hospice facilities. The gerontological and geriatric nurses provide health education for elderly patients about the concept and benefits of physiotherapy by using terms that are easy to understand, assess the extent of the commitment of the elderly to attend physical therapy sessions, the extent of their response during the sessions, and make a schedule of physical therapy sessions of elderly patients to make it easier to remind them and search for factors that affect their adherence***(Chan, Hong, Tan & Chua, 2019 &. (Chen et al., 2020).***

II. AIM OF THE STUDY

The present study aimed to;

Identify barriers of adherence to physiotherapy treatment among geriatric patients in Matrouh, Egypt.

III. RESEARCH QUESTION

Q^1: What is the adherence level to physiotherapy treatment among geriatric patients in Matrouh, Egypt?

Q2: What are barriers of adherence to physiotherapy treatment among geriatric patients in Matrouh, Egypt?

Q3: Is there a relation between barriers factors and adherence level to physiotherapy treatment among geriatric patients in Matrouh, Egypt?

IV. MATERIALS AND METHODS

Materials

Design:

A descriptive research design was utilized

Setting:

The study was carried out at the out patients clinics of the physiotherapy center of Matrouh General Hospital. The working hours of this center are from 8 Am to 2 pm six days per week.

Subjects:

All geriatric patients who attended the previous mentioned setting for physiotherapy sessions for any medical or surgical conditions were recruited conveniently based on the following criteria: - aged 60 years and above, able to communicate and accepted to participate in the study. The sample comprised two hundred and fifteen (215) geriatric patients.

Sample size:

The estimated sample size for this study was 215 geriatric patients, at confidence level 95% and precision rate at 0.05 by using Steven equation, 2012. Since the total number of available geriatric patients was 433.

While;

P= 0.5

N= Total population

Z= Z value "1.96"

D= Standard Error

n= sample size

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

Tools: -

The data was collected through questionnaire containing four parts, it was developed by the researcher after reviewing the related literature as Sinha & Sharma, 2017, Kaka & Maharaj, 2017 and Mayhew et al., 2019. It was written in a simple Arabic language to suit the understanding level of the study subjects.

First part: Socio-demographic characteristics of geriatric patients: This part consists of questions related to the patient's age, sex, marital status, level of education, current work after retirement, level of physical dependency, living arrangement, and level of social support.

Second part: Health profile of geriatric patients: This part consists of questions related to medical history of studied geriatric patients such as; presence of associated chronic diseases, previous hospitalization, previous physiotherapy, smoking, using mobility aids and their body mass index (BMI).

Third part: Level of adherence of geriatric patients to physiotherapy treatment: This part included 7 items such as; commitment to attending physiotherapy sessions, complete the duration of physiotherapy, and adhere to the instructions of the physiotherapist. Responses to each item were graded as the following; two point for "Yes" answer and a single point for the "No" answer. The minimum score was 7 and the maximum score is 14. These scores were summed and were converted into a percent score. It was classified into 2 categories:

-Adherent if score 10- 14 score (≥ 70%)

- Non-adherent if score from 7 - 9 score (< 70%)

Fourth part: Barriers of adherence to physiotherapy treatment among geriatric patients: This part included 15 items for identifying the barriers of adherence to physiotherapy treatment among geriatric patients. Responses to each item were graded on a 3- point Likert scale as follows: "not at all=1, to some extent =2 or very much=3". The minimum score was 15 and the maximum score is 45. These scores were classified into 3 categories:

-Severe barriers if the score ranged from 35- 45 .

-Moderate barriers if the score ranged from 25 – 34 .

-Mild barriers if the score ranged from 15 – 24 .

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Method

- An approval to carry out the study from the responsible authorities of the Faculty of Nursing Matrouh University and physiotherapy center of Matrouh general hospital were obtained after explanation of the purpose of the study, date and time of data collection.
- The study tool was developed by the researcher after a thorough review of relevant literature.
- The study tool was tested for content validity by five (5) experts in the field of the study namely; Gerontological nursing, Geriatric medicine and Physiotherapy. Their opinions elicited regarding the format, layout, consistency, accuracy, and relevancy of the tools.
- The study tool was tested for reliability using Cronbach's coefficient alpha reliability method. The reliability result was = 0.789.
- The pilot study was carried out on 22 geriatric patients those represent 10% of studied geriatric patient selected from the outpatient clinics of the physiotherapy center of the social rehabilitation association in Matrouh in order to test the clarity and applicability of the constructed tool. The pilot has also served to estimate the time needed for each subject to fill in the questionnaire.
- Geriatric patients who meet the inclusion criteria were included conveniently in the study.
- The researcher first met with the studied geriatric patient attended to the previously mentioned setting, explained the purpose of the study after introducing herself. The researcher was visiting the study setting at its working hours (from 8 a.m. - 2 p.m.) two different days each week to collect data. The questionnaire was filled by the researcher during the interview within 20-30 minutes.
- Data collection started from the first of March 2019 till the end of February 2020.

Ethical considerations: -

An informed verbal consent was acquired from every geriatric patient involved in the study after providing appropriate explanations about the purpose of the study. The privacy and anonymity of the participants and confidentiality of the collected data were maintained.

Statistical Analysis:

Data collected from the studied sample was revised, coded and entered using Personal Computer (PC). Computerized data entry and Statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. Data were presented using descriptive statistics in the form of mean S.D and number & percentage. Linear regression model is a linear approach to modeling the relationship between a scalar response and one or more explanatory variable. Using T test and ANOVA to compare means between quantitative group.

V. RESULTS

Table (1) revealed that, the mean age of studied geriatric patients was 70.4± 8.9. Regarding sex, 60.5% of studied geriatric patients were females. About 73% of them were married and 31.6% of them were read and write and 72.1 % of them were either housewife or retired. Also, this table showed that 27.9% of studied geriatric patients were physically independent, 85.1% of them were from urban and 48.9% of them lived with only the spouse.

Table (1): Number and percentage distribution of studied geriatric patients according to their socio-demographic characteristics (N=215).

Items	N	%
Age (year)		
Young -old	145	67.4
Middle -old	55	25.6
Old -old	15	7
Mean SD	**70.4± 8.9**	

Sex		
Male	85	39.5
Female	130	60.5
Marital status		
Married	157	73
Widow	41	19.1
Divorced	17	7.9
Education level		
Illiterate	42	19.5
Read and write	68	31.6
Basic	42	19.5
Secondary	51	23.8
High	12	5.6
Current work after retirement		
Housewife / retired	155	72.1
Professional work	36	16.7
Skilled work	24	11.2
Physical dependency		
Dependent on family members	110	51.2
Dependent on care givers	20	9.3
Dependent on neighbors	25	11.6
Independent	60	27.9
Residence		
Urban	183	85.1
Rural	32	14.9
Living arrangement		
With spouse	105	48.9
With family (Spouse and /or children)	68	31.6
Alone	42	19.5

Table (2) demonstrated that, 38.6% of studied geriatric patients were previously hospitalization within the last year, while 23.3% of them had previous physiotherapy. This table showed that 48.4% of e studied geriatric patients reported arthritis as a reason for undergoing the current physiotherapy treatment. Also, this table detected that, 85.6% of studied geriatric patients had associated chronic diseases and 78.6% of them using mobility aids. Meanwhile, only 16.7% of studied geriatric patients were smokers and only 31.6% of them had a normal weight.

Table (2): Number and percentage distribution of studied geriatric patients according to their medical history (n=215).

Items	N	%
Previous hospitalization within last year		
Yes	83	38.6
No	132	61.4
Previous physiotherapy		
Yes	50	23.3
No	165	76.7
Reasons for undergoing the current physiotherapy treatment		
Arthritis	104	48.4
Complicated fracture	67	31.2
Stroke	34	15.8
Spinal cord injury	10	4.6
Associated chronic diseases		
Yes	184	85.6
No	31	14.4
Smoking		
Yes	36	16.7

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No	179	83.3
Using mobility aids		
Yes	169	78.6
No	46	21.4
BMI		
Under weight	29	13.5
Normal	68	31.6
Overweight	68	31.6
Obese	35	16.3
Extremely obese	15	7

Regarding level of adherence of studied geriatric patients to physiotherapy treatment **Figure (1)** showed that 71% of studied geriatric patients did not adhere to physiotherapy treatment, while 29% of them adhere to physiotherapy treatment.

Figure (1): Percentage distribution of geriatric patients' level of adherence to physiotherapy treatment (N=215).

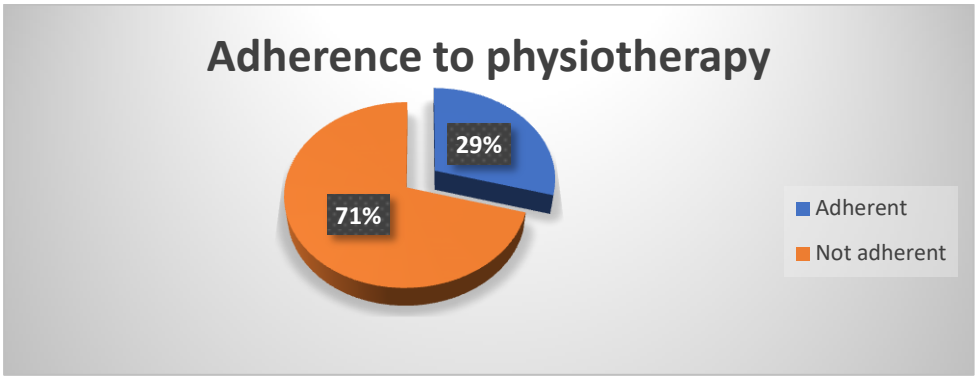
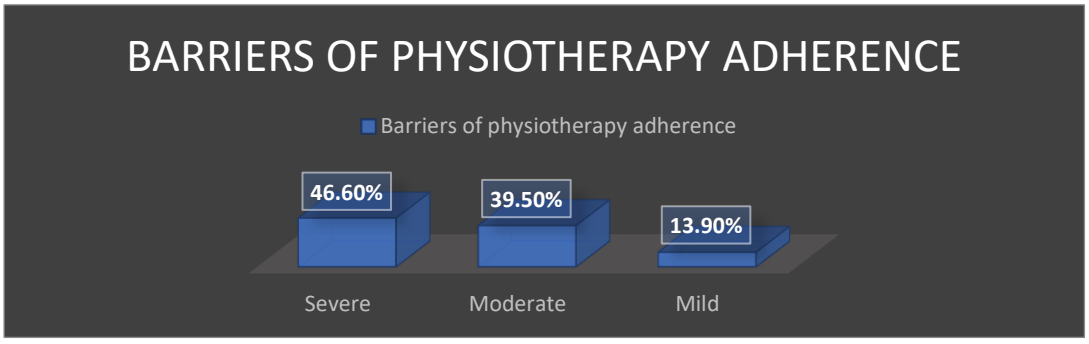


Figure (2) revealed that 46.6% of studied geriatric patients reported suffering severe barriers of adherence to physiotherapy treatment, while 39.5% of them reported suffering moderate barriers and only 13.9% of them reported suffering from mild barriers.

Figure (2): Percentage distribution of barriers of adherence to physiotherapy treatment as reported by studied geriatric patients (N=215).



T**able (3)** revealed that barriers as; physiotherapy related exercises make geriatric patients anxious & depressed, poor knowledge related to physiotherapy exercises, physiotherapy center away from studied geriatric patients' place of residence, physiotherapy treatment is very boring, and lengthy exercise duration were reported by studied geriatric patients as sever barriers of adherence to physiotherapy treatment with mean scores of (2.74±0.56, 2.54±0.87, 2.51±0.71, 2.44±0.42, and 2.39±0.63) respectively. While, barriers as; burden of other associated medical conditions, physiotherapy treatment not useful to studied geriatric patients, feeling tired during physiotherapy treatment, physiotherapy treatment is very expensive, physiotherapy treatment interferes with activities of daily living and instrumental activities of daily living, difficulty in remembering physiotherapy related exercises /instructions, and severity of pain during physiotherapy related exercises / treatment were reported as moderate barriers with mean scores of (2.33±0.54, 2.32±0.60, 2.21±0.64,

2.20±0.84, 2.17±0.84, 1.92±0.73, 1.90±0.92 and 1.87±0.69)respectively. On the other hand, barriers as; discouragement from family and not available time for physiotherapy treatment were reported as mid barriers of adherence to physiotherapy treatment with mean scores of (1.60±0.37 and 1.58±0.88) respectively.

Table (3): Mean scores of sever, moderate and mild barriers of adherence to physiotherapy treatment as reported by studied geriatric patients (N=215).

Items	Mean ± SD
Sever barriers	
1. Physiotherapy related exercises make me anxious and depressed.	2.74±0.56
2. Poor knowledge related to physiotherapy exercises.	2.54±0.87
3. Physiotherapy center away from my place of residence.	2.51±0.71
4. Physiotherapy treatment is very boring.	2.44±0.42
5. Lengthy exercise duration.	2.39±0.63
Moderate barriers	
6. Burden of other associated medical conditions (such as urinary incontinence, greater BMI, osteoarthritis…etc.) on the benefit from physiotherapy services.	2.33±0.54
7. Physiotherapy treatment not useful to me.	2.32±0.60
8. Feeling tired during physiotherapy treatment.	2.21±0.64
9. Difficult traveling to physiotherapy center.	2.20±0.84
10. Physiotherapy treatment is very expensive.	2.17±0.84
11. Physiotherapy treatment interferes with the ability of geriatric patients to perform the activities of daily living and instrumental activities of daily living.	1.92±0.73
12. Difficulty in remembering physiotherapy related exercises /instructions.	1.90±0.92
13. Severity of pain during physiotherapy related exercises/ treatment.	1.87±0.69
Mild barriers	
14. Less encouragement from family.	1.60±0.37
15. Not available time for physiotherapy treatment.	1.58±0.88

Table (4) revealed that there was a high significant correlation between age, living arrangement, residence, educational level of studied geriatric patients and their adherence level to physiotherapy treatment at p value <0.01. While, there was a slight significant correlation between marital status, current work and physical dependency of studied geriatric patients and their adherence level at p value <0.05. But there was no significant correlation with sex at p value >0.05.

Table (4): Relation between characteristics of studied geriatric patients and their adherence level to physiotherapy treatment (N=215).

Items	Adherence level to physiotherapy treatment	X^2 P value
	Mean ± Sd	
Age		
Young -old	**4.51±1.68**	**Anova test**
Middle -old	**3.55±1.37**	**9.684**
Old -Old	**2.98±0.96**	**.000****
Sex		
Male	**3.38±0.75**	**T test**
Female	**3.46±0.84**	**1.648**
		.059
Marital status		
Married	**3.99±0.87**	**Anova test**
Widow	**3.19±0.96**	**3.604**
Divorced	**3.12±1.30**	**.018***

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Educational level		
Illiterate	**1.99±0.75**	**Anova test**
Read and write	**2.48±0.83**	**7.342**
Basic	**2.51±0.96**	**.003****
Secondary	**2.89±1.01**	
High	**3.64±0.85**	
Current work after retirement		
Housewife/ No job	**2.68±0.55**	**Anova test**
Professional work	**3.57±0.83**	**4.110**
Skilled work	**3.82±0.34**	**.011***
Residence		
Urban	**3.96±1.41**	**T test**
Rural	**2.28±1.30**	**5.947**
		.009**
Physical dependency		
Dependent on family	**3.08±0.84**	**Anova test**
Dependent on caregiver	**3.21±0.96**	**3.944**
Dependent on neighbors	**3.14±1.05**	**0.016***
Independent	**4.25±1.23**	
Living arrangement		
With spouse	**3.74±0.98**	**Anova test**
With family (Spouse and /or children)	**4.12±0.82**	**6.157**
Alone	**3.08±1.02**	**.004****

**** High significant correlation at p value <0.01.**

*** Slight significant correlation at p value <0.05.**

Table (5) revealed that there was a high negative correlation between barriers of adherence to physiotherapy treatment and levels of adherence of studied geriatric patients to physiotherapy treatment at p value <0.01.

Table (5): Correlation between studied variables.

Items		Adherence level to physiotherapy
Barriers	**r.**	**-0.587**
	p	**0.005****

**** High significant correlation at p value <0.01.**

Table (6) detected that there was a high negative predictor effect of reasons of undergoing the current physiotherapy treatment and using mobility aids on adherence to physiotherapy at p value <0.01. and there was a slight negative predictor effect of BMI and associated chronic diseases on their adherence level at p value <0.05. on the other hand, there was a high positive predictor effect of receiving a previous physiotherapy on their adherence level at p value <0.01.

Table (6): Multiple Linear regression model

Items	Unstandardized Coefficients	standardized Coefficients		
	B	β	**T**	**P. value**
Receiving previous physiotherapy	0.497	0.568	4.641	.009**
Reasons of undergoing the current physiotherapy treatment	- 0.516	0.612	6.103	0.003**
Associated chronic diseases	- 0.326	0.482	3.620	0.010*
BMI	- 0.308	0.304	2.641	0.023*

Using mobility aids	- 0.419	0.391	5.681	0.002**
	ANOVA			
Model	Df.		F	P value
Regression	7		5.194	0.009**

a. Dependent Variable: ***Adherence to physiotherapy.***

b. Predictors: (constant) previous hospitalization, reasons of current physiotherapy treatment, associated chronic diseases, BMI and using mobility aids.

**** High predictor effect at p value <0.01.**

*** Slight predictor effect at p value <0.05.**

VI. DISCUSSION

Poor adherence to physiotherapy treatment can have negative effects on health outcomes and healthcare cost. Little is known about barriers of adherence to physiotherapy treatment among geriatric patients. Identification of barriers may help gerontological/geriatric nurse to determine geriatric patients at risk of non-adherence and suggest methods to reduce the impact of those barriers thereby maximizing their level of adherence. ***(Zakari, Mayana, Mukhtar, Badaru & Ododo, 2016).***

Regarding socio-demographic data of studied geriatric patients, the current study revealed that the mean age of studied geriatric patients was 70.4± 8.9, more than two thirds of them were married, about one third of them were read and write. Also, regarding sex, about two thirds of studied geriatric patients were females. These results inconsistent with the study conducted by **Kowalska, Mazurek, Kubasik & Rymaszewska, 2019** about "Effectiveness of physiotherapy in geriatric patients with dementia: a prospective, comparative analysis", who reported that the mean age of studied geriatric patients was 80.2±7.9, more than half of them had primary and vocational education and only one quarter was married. But, cohort with the study performed by **Demirel, Oz & Ulger, 2019** about "The effect of minimal invasive techniques and physiotherapy on pain and disability in elderly: A retrospective study", who revealed that more than three quarters of studied geriatric patients were females.

Also, the present results detected that only less than one third of studied geriatric patients were physically independent, more than three quarters of them were from urban and around half of them lived with spouse. These results supported with the study done by **Kasuga, Momosaki, Hasebe, Sawabe & Sawaguchi, 2019** titled in "Effectiveness of self-exercise on elderly patients after hip fracture: A retrospective cohort study", who reported that two fifth of studied geriatric patients were physically independent. Also, in agreement with the study done by **Dimitrova**, **Lubenova, Grigorova-Petrova, Maznev & Nikolova, 2016** titled in "The effectiveness of long-term physical therapy in elderly patients", who reported that slight less than two thirds lived with their spouse.

Related to medical history, the current results demonstrated that, more than one third of studied geriatric patients were previously hospitalized within the last year, while less than one quarter of them had previous physiotherapy and about half of them reported arthritis as a main reason for undergoing the current physiotherapy treatment. Also, it is detected that, more than three quarters of studied geriatric patients suffered from associated chronic diseases and using mobility aids. Meanwhile, only less than one fifth of studied geriatric patients were either smokers or underweight. These results cohort with the study conducted by **Ling, Ter Meer, Yumak & Veltkamp, 2017** about "Usability test of exercise games designed for rehabilitation of elderly patients after hip replacement surgery", who showed that two thirds of geriatric patients had associated chronic disease and more than half using mobility aids. Also, supported with the study done by **Moore, Holden, Foster & Jinks, 2020** titled in "Therapeutic alliance appears to facilitate adherence to physiotherapy-led exercise and physical activity for older adults with knee pain", who detected that more than one quarter were admitted the hospital at last years.

According to barriers factors to physiotherapy treatment, the present results revealed that slight less than half of studied geriatric patients suffered severe barriers as; exercises make them anxious and depressed, poor knowledge related to physiotherapy related exercise, physiotherapy center away from studied geriatric patients place of residence, and

physiotherapy sessions is very boring. While, showed that more than one third suffered moderate barriers as; physiotherapy treatment not useful to studied patients, feeling tired during physiotherapy treatment, difficult traveling to physiotherapy center and physiotherapy treatment is very expensive. On the other hand, only more than one tenth of them had mild barriers as; discouragement from family and not available time for physiotherapy treatment. These results may be due to half of studied geriatric patients were either illiterate or read and write so suffered from poor knowledge and more than three quarters of them suffered from associated chronic disease , only less than one third had normal BMI and more than half of them were physically dependent on their family members, caregivers or neighbors that cause emotional disturbance and difficulties to be compliant with the physiotherapy treatment .

These results are congruent with the study performed by **Basri, Naseen & Naz, 2017** about "Factors affecting compliances with physiotherapy among stroke patients: physiotherapist's perspective", who stated that the main factors identified were: misconception about physiotherapy, poor awareness and poor infrastructure for physiotherapy. Also, it is in agreement with the study done by **Moore et al., 2020** who detected that factors facilitating long-term adherence included knowledge about the role of physiotherapy treatment for knee pain. Moreover, these results supported with the study done by **Picorelli, Pereira, Pereira, Felício & Sherrington, 2014** who reported that adherence to exercise programs for geriatric patients is influenced by program characteristics and personal factors and identified that personal factors associated with better adherence included: physical factors (better physical abilities) and psychological factors (fewer anxiety and depressive symptoms). On the other hands, these results are inconsistent with the study done by **Shaikh & Dandekar, 2019** titled in "Perceived Benefits and Barriers to Exercise among Physically Active and Non-Active Elderly People", who revealed that only one quarter of them reported that place far away as a barrier.

Regarding adherence level of studied geriatric patients to physiotherapy treatment, the current results demonstrated that more than two thirds of them not adherent to physiotherapy. At the researcher point view, these results may be due to slight less than half of studied geriatric patients suffered from severe barriers and only less than one quarter had a previous physiotherapy treatment. These results are regular with the study performed by **Nelligan et al., 2019** titled in "Effect of a short message service (SMS) intervention on adherence to a physiotherapist-prescribed home exercise program for people with knee osteoarthritis and obesity", who stated that more than two thirds of the studied subjects reported low adherence to physiotherapy. But, inconsistence with the study conducted by **Kaka & Maharaj, 2017** about "Factors affecting adherence to exercises treatment among knee osteoarthritis patients attending physiotherapy treatment", who demonstrated that more than half of studied geriatric patients were adherent to physiotherapy treatment.

Regarding the correlation between level of adherence and barriers factors, the present results stated that there was a high negative correlation between level of adherence and barriers factors at p value <.01. These results are regular with the study performed by **Peek, Carey, Mackenzie & Sanson-Fisher, 2018** about "Patient-perceived barriers and enablers to adherence to physiotherapist prescribed self-management strategies", who reported that barriers had a negative effect on patients' level of adherence to physiotherapy treatment.

According to the relation between characteristics of studied geriatric patients and their level of adherence with the physiotherapy treatments, this study revealed that there was a high significant relation between age, living arrangement, residence, educational level of studied geriatric patients and their adherence level at p value <0.01. While, there was a slight significant relation between marital status, current work and physical dependency of studied geriatric patients and their adherence level at p value <0.05. But there was no significant relation with sex at p value >0.05. These results consistent with the study done by **Rivera-Torres, Fahey & Rivera, 2019** titled in "Adherence to exercise programs in older adults: informative report", who detected that factors affecting adherence to physiotherapy treatment include socioeconomic status, education level, living arrangements, and health status. Also, it is regular with the study performed by **Kaka & Maharaj, 2017** about "Factors affecting adherence to exercises treatment among knee osteoarthritis patients attending physiotherapy treatment", who stated that there was significant association between level of adherence to level of education at p value <0.05.

Regarding to linear regression, the current results revealed that, there was a high negative predictor effect of reasons of current physiotherapy treatment and using mobility aids on adherence to physiotherapy at p value <0.01, and there was a slight negative predictor effect of BMI and associated chronic diseases on their adherence level at p value <0.05. But there was a high positive predictor effect of receiving previous physiotherapy on their adherence level at p value >0.05.

These results are supported with the study done by **Sun et al., 2020** titled in "Barriers and facilitators of adherence to a perioperative physical activity intervention for older adults with cancer and their family caregivers", who showed that barriers affecting adherence included comorbid health conditions, physical symptoms, functional limitations, anxiety, other roles and responsibilities, unexpected life events and motivation. On the other hand, it is in disagreement with the study done by **Nicolson, Hinman, Wrigley, Stratford & Bennell, 2019** titled in "Effects of covertly measured home exercise adherence on patient outcomes among older adults with chronic knee pain", who reported that exercise adherence was not associated with types of associated medical problems and changes in pain, function, and knee extensor strength".

VII. CONCLUSION

This study concluded that, more than two thirds of studied geriatric patients did not adhere to physiotherapy treatment. The highest barriers affecting adherence of geriatric patients to physiotherapy treatment were; the anxiety and depression associated with physiotherapy related exercises, poor knowledge related to physiotherapy and its exercises, the physiotherapy center away from geriatric patients' place of residence and the patients' perceptions to physiotherapy treatment as very boring. There was a high negative correlation between barriers and adherence of geriatric patients to physiotherapy treatment at p value <0.01.

VIII. RECOMMENDATIONS

The present study recommended that the Gerontological / Geriatric nurse should spent an extra time early during physiotherapy treatment to discuss with the geriatric patients and their families their; attitudes, beliefs, and concerns about the physiotherapy treatment, as well as, their role during the physiotherapy treatment trajectory, and put spot on the importance of adherence to physiotherapy treatment for better outcomes. Individual components of home-based exercise prescription such as intensity, duration, frequency, and number of exercises should be given in written forms and in amounts that will be enjoyable (not over prescribed) and suited to the daily routines of each geriatric patient. Steps could be taken to formulate such treatment strategies like group therapies and using virtual reality applications to support the geriatric patients' adherence to physiotherapy treatment. Moreover, the provision of more governmental physiotherapy services could be planned for rural areas in Matrouh governorate.

IX. LIMITATIONS

The data gathered depends upon the reliability of the studied subjects. The present study did not study the adherence issue related to a specific disease condition or treatment protocol. The study did not examine the point of view of physiotherapy working staff regarding geriatric patients' adherence.

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