COMMON REASONS FOR DRUG NON-COMPLIANCE IN PATIENTS WHO ARE ATTENDING OUT- PATIENTS CLINICS IN MAKKAH CITY, SAUDI ARABIA IN 2022

Yahya Hassan alzahrani[1*], Mohammad Anwar Mahmoud Banjar[2], Ashraf Abdulrahim Alsaedi[3], Taghreed Mohammed Alotaibi[4], Sahar Hassan Alsharif[5], Abdullah Najeh Bajaber[6], Turki Mohammed AlQurashi[7], Musab Ali Alhakami[8], Mohammed Abdulwahab AlZahrani[9], Emad Hassan AlKhuzaee[10]

Abstract:

Background:

Medication noncompliance has a significant effect on morbidity, mortality, and ease of living in patients. Non-compliance may be associated with patient demographics, the complexity of the drug regimen, dosage frequency, adverse effects, or some combination of these. Medication noncompliance morbidities and mortalities worldwide and medication compliance is crucial in achieving target patient complication and control of diseases. Dose compliance (also known as dose adherence) means the strict commitment of the patient to the medication dosage regimen as prescribed. Therefore, dose delay or omission, therapy dis continuation, or even shifting to a different regimen at the patient's discretion is considered dose noncompliance or non-adherence. In diseases requiring long-term or life-long treatment, dose adherence is a serious issue. Non-adherence can lead to drug plasma concentration undershoot (i.e., trough below minimum effective concentration) or overshoot**.**

Aim of the study: To assessment of the Common reasons for drug non-compliance in patients who are attending out- patient's clinics in Makkah City, Saudi Arabia in 2022**.**

Method: cross sectional study conducted at outpatient clinics in Al-Aklas primary health care center in Makkah Al-Mukarramah Saudi Arabia in Sample population consists of Saudi out patients aged 20 to 60 years attending. Our total participants were (200**).**

Results: majority the age majority of the study groups were in the age range of (20 - 40%) years were (40.0%), regarding the gender many of the respondents were male (70.0 %) while female were (30.0%). Regarding the education status, the majority of the respondents had University degree were (42.0%), while Occupation the most of the participants answer yes were (65.0%). Regarding the income the majority of them had incomes from more than 9000SR were (33.0%**).**

Conclusion: A high prevalence of non – compliance is still a problem in the treatment of patients, particularly those who had positive risk factors. Further studies are needed to reduce noncompliance through various ways and means. The study also highlights that the interaction of the various factors has not been studied systematically. Drug non-compliance not only includes patient compliance with medication but a lot of factors For example also with diet, exercise, or life style changes.

Keywords: assessment, Common, reasons, drug, non-compliance, patients, attending, outpatient clinics, Makkah City.

[1*]Dental resident, Bahrah PHC, Makkah, Saudi Arabia.
[2,3,4,5,6]Pharmacist, Makkah Maternity and Children Hospital, Saudi Arabia.
[7,8,9,10]Technician Pharmacy, Makkah Maternity and Children Hospital, Saudi Arabia.

***Corresponding Author:** Yahya Hassan alzahrani
*Dental resident, Bahrah PHC, Makkah, Saudi Arabia.

DOI: 10.53555/ecb/2022.11.02.018

Introduction

Background

Non-compliance for the medication is an important area of concern in diseases requiring long-term or life-long treatment as it contributes to relapse and re-hospitalization of the patients. (1) One of the ways to improve the drug compliance is to know crucial factors responsible for poor drug compliance and hence that proper strategies may be planned to improve patient's drug compliance.(2). Non-compliance patient's with diseases drug results in recurrent seizures and visits to the emergency departments, leading to an increased social and economic burden, as well as increased morbidity and mortality.(3) Non-compliance for the medication is still considered a bane in patient's, for example approximately 20% of individuals over 60 years of age have diabetes mellitus, and almost half of these individuals have been undiagnosed.(4) When patients do not follow the instructions to take medications regularly, they are then at risk against higher morbidity, mortality, and reduced quality of life progressively.(5) An article online reported that this patient's behavior might be related to "patient demographics, the complexity of the drug regimen, dosage frequency, adverse effects, or some combination of these."(6) It is a widespread belief that patients are less adherent to therapy. Non-compliance is a significant barrier to treatment efficacy. Studies have also found that forgetfulness is one of the crucial causes of non-compliance. Other factors included a busy life, poly pharmacy, and regimen complexity.(7)

Result of unseen or unreported therapeutic non-compliance, doctors could modification the plan, which can increase the value or quality of the treatment, therefore additional increasing the burden on the care system.(8) in addition , so as to formulate effective methods to contain the matter of non-compliance, there's a desire to consistently review the factors that contribute to non-compliance. Associate understanding of the prophetic worth of those factors on non-compliance would conjointly contribute absolutely to the designing of any sickness management program. (9)

This undesirable behavior is particularly problematic in morbid diseases such as schizophrenia, where departure from the prescribed doses has been associated to symptom exacerbation, psychotic state relapse, diminished cognitive capacity, violence, hospitalization, and, most importantly, increased risk of suicide (10). It is quite alarming that non-adhesion to antipsychotic drugs (ASD) was cited as the most common cause for admittance to psychiatric hospitals (11). More than 50% of patients with schizophrenia fail to adhere to the prescribed dosage regimens of ASDs (12). This phenomenon has been related to ASD inefficiency, intolerability and costs (13).

In health care, the compliance generally used definition of compliance is "patient's behaviors (in phrases of taking treatment, following changes eating style or modification heaped, Physiotherapy or executing life style changes) coincide with healthcare providers' hints for fitness and scientific advice". (14) That disappointment of patients to consistence with the medication is a significant issue if there should arise an occurrence of mental patients. Non-compliance of patients with recommended medication is considered as a boundary to compelling medicinal services. (15) Compliance is "patient's behaviors (in phrases of taking treatment , following changes eating style or modification heaped , Physiotherapy or executing life style changes) coincide with healthcare providers' hints for fitness and scientific advice".(16) That disappointment of patients to consistence with the medication is a significant issue if there should arise an occurrence of mental patients. Non-compliance of patients with recommended medication is considered as a boundary to compelling medicinal services. (17)

Review of literatures

Many works of literature have shown similar findings regarding non – compliance among patients with known socio demographic risk factors. Studies showed omission to take medications ranged between 45% to 58% contrary to other studies (18) that showed a much lower (25-30%) non –compliance of medication intake. Depression associated with non – compliance was also significantly present in the studies, and a survey by Mitchell et al. (2021) (19).

Prescription adherence can be characterized as accepting meds as prompted and recommended experts for the expressed span (20). The non-adherence further outcomes in malady related intricacies and comorbidities that may build the recurrence of medical clinic confirmations, crisis visits and direct treatment costs. These immediate expenses, contingent on the medicinal services division of a nation, may either be borne by the health sector or in some cases the patient. (21)

Several studies found that patients with higher educational level might have higher compliance.(22) However, Farley et al ,(2020) found that even highly educated patients may not understand their conditions or believe in the benefits of being compliant with their medication

regimen.(23) A UK study group found that patients without formal educational qualifications had better compliance with cholesterol-lowering medication. Studies have shown that most of the uneducated participants with little or no knowledge of diabetes presented with non-compliance. (24)
Before we are able to formulate ways to tackle the problem of difficulty drug non-compliance, we'd like to evaluate the clinical and alternative implications of therapeutic non-compliance. From the attitude of tending suppliers, drug compliance may be a major medical problem for 2 causes. (25)
Other studies have shown that patient's worries about the treatment, believing that the disease is uncontrollable and religious belief might add to the likelihood that they are not compliant to therapy. (26)
A healthy relationship depends on patients' trust in prescribers and empathy from the prescribers. Studies have found that compliance occurs when doctors are emotionally supportive, giving reassurance or respect, and treating patients as an equal partner. (27) Similarly, studies showed a high presence of risk factors associated with compliance like communication problems with the doctors and long waiting times in the clinic, which could impact the medication compliance.(28)
Furthermore, other than direct budgetary effect, drug non-compliance would have indirect price suggestions because of the loss of profitability, without referencing the significant negative impact on patient's nature of life. (23)
Treatment noncompliance significantly affects morbidity, mortality, and simplicity of living during the illness. Non-compliance could also be related to patient demographics, the complexness of the medication routine, dose recurrence, antagonistic impacts, adverse effects or some combination of those It is an across the board conviction that patients are less disciple to treatment as a result of declining psychological capacity. (21)

Rationale

Result of unseen or unreported therapeutic non-compliance, doctors could modification the plan, which can increase the value or quality of the treatment, therefore additional increasing the burden on the care system, in addition, so as to formulate effective methods to contain the matter of non-compliance, there's a desire to consistently review the factors that contribute to non-compliance. Associate understanding of the prophetic worth of those factors on non-compliance would conjointly contribute absolutely to the designing of any sickness management program, medication non-compliance is an ignored health problem in developing countries, It is one of the challenging global issues; non-adherence to medication results in active disease progression and increased treatment costs which have an alarming average of less than 50% of patients complying with medication instructions.

Aim of the study

To assessment of the Common reasons for drug non-compliance in patients who are attending out-patient's clinics in Makkah City, Saudi Arabia in 2022**.**

Specific objective

- To assess reasons of drug noncompliance among patients who are attending out patients clinics in primary health care in Makkah City
- To identify patient solutions to increase their drug compliance.

Methodology

Study setting:

This study has been conducted at outpatient clinics in in Makkah City, Saudi Arabia

Study Population

The study population consists of Saudi out patients clinics aged 20-60 years attending to outpatient clinics in in Makkah City, Saudi Arabia.

Study Design

Cross-sectional, analytic study, systematic random sampling technique

Inclusion criteria:

- Out patients aged 20-60 years
- Able and willing to participate in the study.
- Take some sort of prescribed medications.

2.5 Exclusion Criteria

Out patients less than 20 years
Not able and refuses to participate in the study.

Sample size:

Using EPI info version 7 (50), the study sample size has been determined based on the following assumptions :
Since there is not an official release, e.g., by the "Central Department of Statistics and Information" in Saudi, of the exact census of Makkah City residents falling within the study's age category, a source population size of the same of has be assumed. (Definitely, the true population of such category is greater, also to be most conservative, the least number needed for a reasonably large

sample size that allows generalizability of the study result.

A given estimate that patients with expected frequency of having awareness of PMS = 15%. Tolerable error 5%. Confidence level = 95%. Design effect (for cluster surveys-DEFF) =1. Accordingly, a sample size (n) would be (200). In order to account for non-response and achieve more generalizable results, the investigator has be increase the sample size up to 200.

Sampling Technique:

Makkah City Regarding health care center selection, there are three health care sectors inside Makkah Al-Mukarramah which are Al-Ka'akya, Al-Zahir and Al-Adl. By using simple random sample technique (by using randomizer.org), Al-Adl health care sector was selected. There are 12 primary health care centers under Al-Adl health care sector which was enumerated from 1 to 12. Again, by using simple random sample technique Al-Adl primary health care center was selected (by using randomizer.org website).

Regarding patients' selection, the total number visiting Al-Adl PHC is 1711 per month and the sample size is 200. The data collection period is 20 days (four weeks minus weekends).

Every day there are nearly 85 patients attending in Al-Adl PHC in both section (male and female sections). To collect data from sample size, the researcher needs nearly 18 patients per day to collect desired sample size. The researcher has been selecting every 4th patient to cover the sample size during data collection period.

Sampling method:

Makkah city the total number of elderly patients attending Al-Adl primary health care center (under Al-Adl health care sector) in one month is 1711. Based on this information sample size was calculated using a website (raosoft.com).

The resulted estimated sample size is 200 elderly patients. The confidence interval is 95% and margin of error is 5%. The estimated prevalence used is 50% to calculate maximum sample size.

Data collection method:

Self-administered questionnaire has been given to all participants. Those who have trouble reading or writing the questionnaire, has be filled by the interviewer.

Questionnaire:

An Arabic self-administered questionnaire has been used. It consisted of three sections. The first section is on the socio-demographic and presence of chronic disease, and present medication history (e.g., age and education level).

The second sections cover common reasons of drug noncompliance (patient, medication, health care related factors). The third section addresses the part the possible suggestion to increase the patient level of adherence and compliance with medications.

Data Collection Technique

The researcher has visit the health care center Makkah City The researcher has filled the questionnaires through the interview with patients who are attending elderly patients attending health care center Makkah City met the inclusion criteria after taking their verbal consent. After obtaining necessary approvals, the researcher and one trained nurse used an Since all Makkah centers work on walk-in basis, i.e., using "systematic random sampling" technique .

Data Entry and Analysis

Data has been collected and coded and then entered to a MS program with adequate backup. Descriptive statistics, e.g., number, proportions, cumulative proportions, mean and standard deviation, etc. has been displayed, as appropriate. Analytically, a parametric technique, e.g., t-test and ANOVA, has been attempted, as applicable, especially analyzing normally distributed variables. Otherwise, a non-parametric alternative, e.g., Man Whitney U test and ANOVA or χ^2 test of independence, has been used, as necessary. The Statistical Package for Social Sciences (SPSS) software for MS- version-20 will be used for the analysis. All tests has been conducted at level of significance a=0.05; results with p-values<0.05 has been considered "statistically significant".

Pilot Study

A pilot study has been done on 10 Saudi patients who meet the study's eligibility criteria.

The pilot study has been mainly help examine both the instrument's content validity and construct validity issues, alongside with other needed information.

Ethical Considerations

Necessary approval has been the Research Ethics Committee of the PHC in Makkah, shall be obtained prior to the study.

A written consent has been obtained both from PHC, Makkah region administration. The aim of the study has been explained to them.

Feedback about the results has been sent to these organizations .Data has been treated confidentially and has been used only for the purpose of research.

Budget: Self-funded.

Results

Table (1) Distribution of the socio-demographic details among the patients who are attending out- patients clinics included (200)

	N	%
Age		
20-40	80	40.00
40-60	56	28.00
More than 60	64	32.00
Gender		
Female	60	30.00
Male	140	70.00
Education		
Illiterate	16	8.00
Primary	22	11.00
Preparatory	38	19.00
Secondary	40	20.00
University	84	42.00
Occupation		
Yes	130	65.00
No	70	35.00
Income		
Less than 3000SR	52	26.00
3000-6000SR	44	22.00
6000-9000SR	38	19.00
More than 9000SR	66	33.00

Regarding the age majority of the study groups were in the age range of (20 - 40%) years were (40.0%) , regarding the gender many of the respondents were male (70.0 %) while female were (30.0%). Regarding the education status, the majority of the respondents had University degree were (42.0%), while Occupation the most of the participants answer Yes were (65.0%). Regarding the income The majority of them had an income from More than 9000SR were (33.0%).

Table (2) description presence of chronic disease, duration of chronic disease, number and type of drugs among the patients

	N	%
chronic diseases		
No	36	18.00
Yes	164	82.00
Duration of chronic disease		
Less than 5 years	82	41.00
5-10.	64	32.00
More than 10	54	27.00
Number of drugs		
1-3.	114	57.00
4-6.	40	20.00
6 or more	46	23.00
Type of drugs		
pills	162	81.00

sprayer	44	22.00
injection	68	34.00
drink	24	12.00
Non	20	10.00
Are you regularly committed to taking medications?		
No	40	20.00
Some time	80	40.00
Yes	80	40.00
Did you forget to take your medication on time sometimes?		
No	60	30.00
Yes	140	70.00
Are you not interested in taking your medicines on time?		
No	160	80.00
Yes	40	20.00
If I feel better, sometimes I stop taking medicines?		
No	120	60.00
Yes	80	40.00
If I feel bad when I take the medicine sometimes, will I stop taking it?		
No	110	55.00
Yes	90	45.00

Regarding the majority of the study heave who suffer from chronic diseases their answer Yes were (82.0 %). also the study showed regarding the duration of chronic disease most of participant less than 5 years were (41.0%) followed by from 5-10 were (32.0 %). Regarding the number of drugs the majority of the Participants who takes 1-3 drugs percentage were (57.10 %).

Regarding the type of drugs the majority of the Participants who takes pills were (81.0%) followed by injection were (34.0%).

Regarding regularly committed to taking medications the majority of the Participants Some time were (40.0%) followed by Yes were (40.0%).

Regarding you forget to take your medication on time sometimes the majority of the Participants answer yes were (70.0%).

Regarding you not interested in taking your medicines on time the majority of the Participants No were (80.0%) followed by were (20.0%). Regarding if feel better, sometimes I stop taking medicines the most of participant were No were (60.0%).

Regarding If I feel bad when I take the medicine sometimes, will I stop taking it he majority of the Participants answer No were (55.0%), followed by yes were (45.0%).

Table (3) Description common reasons of drug noncompliance related factors (patient, medication, health care related factors).

	N	**%**
Patient related factors:		
Low income	64	32.00
Presence of sensory impairment	44	22.00
Weak memory	74	37.00
Insufficient knowledge about medications	80	40.00
Depression, sense of unusualness	76	38.00
No progress.	98	49.00
No social or peer support.	62	31.00
I don't trust the doctor.	38	19.00
Medication related factors		

Too much medication.	110	55.00
Too long time.	98	49.00
Complexity of medication.	82	41.00
Improper timing.	60	30.00
Not available.	98	49.00
Health care relate factors		
Negative physician attitude.	40	20.00
Less availability of health centers.	160	80.00
Patients suggest enhancing his compliance		
Change the form of drug.	126	63.00
Regulate the time of doses.	154	77.00
Multidrug in one bill.	172	86.00
Take advice from more than one doctor.	124	62.00
Social and emotional support	176	88.00

Regarding Patient related factors the majority of the Participants answer the (No progress, Insufficient knowledge about medications, depression, sense of unusualness, weak memory was respectively (49.00%, 40.0% , 38.0% , 37.0%).

Regarding Medication related factors the majority of the Participants the Too much medication, Too long time, Not available, Improper timing) percentage were respectively (55.0%, 49.0%, 49.0%, 30.0%).

Regarding Health care relate factors the majority of the Participants answer (Less availability of health centers, Negative physician attitude) percentage were respectively (80.0 %, 20.0 %).

Regarding Patients suggest enhancing his compliance the majority of the Participants answer the (Social and emotional support, multidrug in one bill, the time of doses, change the form of drug) were respectively (88.0%, 86.0%, 77.0%, 63.0%).

Discussion

In this study, aim to assessment of the Common reasons for drug non-compliance in patients who are attending out- patient's clinics in Makkah City, Saudi Arabia in 2022, the prevalence of non-compliance medications in patients were (20.0%) this is generally much lower than those studies in neighboring countries, which like China, India, Pakistan, Korea and Hong Kong, which ranges from 24.9% up to 48.3% (19). However, this is still higher compared to United States which multiple studies had shown a very low non-compliance rate which ranges from 9.6% to 19.9% (15). However, our finding was surprisingly lower than a local study done in Malaysia which showed a non-compliance rate among hypertensive patients as high as 46.6% (29). This may be due to the fact that studies setting are in a tertiary health care hospital rather than primary care clinic which is more representative of the community population .

In our study shows the socio-demographic details included (200) participant patients who are attending outpatient clinics in health care center Makkah City, the age majority of the study groups were in the age range of (20 - 40%) years were (40.0%) , regarding the gender many of the respondents were male (70.0 %) while female were (30.0%). Regarding the education status, the majority of the respondents had University degree were (42.0%), while Occupation the most of the participants answer yes were (65.0%). Regarding the income The majority of them had an income from More than 9000SR were (33.0%), (See table 1)

Were enrolled in this study common reasons of drug noncompliance related factors and presence of chronic disease, duration of chronic disease , number and type of drugs among the patients(patient, medication, health care related factors).(Insufficient knowledge about medications , no progress , depression sense of unusualness , weak memory the majority of the study heave who suffer from chronic diseases their answer Yes were (82.0 %). also the study showed regarding the duration of chronic disease most of participant less than 5 years were (41.0%) followed by from 5-10 were (32.0 %). Regarding the number of drugs the majority of the Participants who takes 1-3 drugs percentage were (57.10 %). Regarding the type of drugs the majority of the Participants who takes pills were (81.0%) followed by injection were (34.0%). (See tabal 2) the patients were non-compliant due to the side effects of medication mainly sedation and weight gain. Similarly patients who discontinue prescribed neuroleptic medicine side effects as their primary reason for non-compliance (30). Found hopelessness as a cause of non -compliance to medication in patients . (31) Two studies also reported lack of emotional support

and help from family members and friends as the causes of poor drug compliance in the patients (25) are not compliant to medication due to financial problems. This is in accordance with that reported by other study. Were non- compliant to medication due to no improvement in the medication . Similarly reported no improvement as a cause of non- compliant to medication .of the non - compliant were due to too much of medication. Similarly were not compliant due to too much of medication as reported. (32)

Conclusion

The above evidence indicates that non-compliance is still commonplace in healthcare, and no substantial change occurred despite a large number of studies attempting to address and highlight the problem. Also, too few studies done systematically to quantify the impact of non-compliance on the health of patients . More surveys on factors influencing compliance are needed, particularly in Saudi Arabia, which would be helpful to fill in the knowledge gap and contribute to formulating strategies at the individual and community level for countering non-compliance.

References

1. Hui, C. L., Lam, B. S., Lee, E. H., Chan, S. K., Chang, W. C., Suen, Y. N., & Chen, E. Y. (2020). Perspective on medication decisions following remission from first-episode psychosis. *Schizophrenia Research*, *225*, 82-89.
2. Alfattni, W. A., Alshareef, M. N. S., El Sunni, I. B. F. A., Alsubhi, W. A., Alshareef, T. N. S., Alatyani, F. T. H., ... & Ateeq, M. COMMON REASONS FOR DRUG NONCOMPLIANCE IN PATIENTS WHO ARE ATTENDING OUTPATIENT CLINICS IN PRIMARY HEALTH CARE AT MAKKAH AL-MOKARRAMAH. *European Journal of Molecular & Clinical Medicine (EJMCM)*, *6*(01), 2019.
3. Ferdinand, K. C., Senatore, F. F., Clayton-Jeter, H., Cryer, D. R., Lewin, J. C., Nasser, S. A., ... & Califf, R. M. (2017). Improving medication adherence in cardiometabolic disease: practical and regulatory implications. *Journal of the American College of Cardiology*, *69*(4), 437-451.
4. Ahmed, S. M., Sami, W. M., Alkanhal, H. F., Alenzi, A. N., Alotaibi, W. S., Alotaibi, K. A., & Almshafi, A. A. (2020). Study of the prevalence and risk factors of treatment non-compliance among elderly diabetic patients in Majmaah, KSA. *Annals of Medical and Health Sciences Research*.
5. Crisan, D., Procopet, B., Epure, A., Stefanescu, H., Suciu, A., Fodor, A., ... & Crisan, N. (2020). Malnutrition and non-compliance to nutritional recommendations in patients with cirrhosis are associated with a lower survival. *World Journal of Hepatology*, *12*(10), 829.
6. Tsigkas, A. (2021). *The performative enterprise: ideas and case studies on moving beyond the quality paradigm*. Springer Nature.
7. Alshammari, F. S. S. (2021). *Accreditation Standards and Emergency Care: An Evaluation of Quality of Care in Emergency Departments of Accredited Public Hospitals in Saudi Arabia* (Doctoral dissertation, La Trobe).
8. Patel, K., Abraldes, J., Wells, M., Niazi, M., & Bain, V. (2021). S1142 The Alberta Exception Pathway for Liver Transplant for Alcohol-Related Liver Disease Patients Without 6 Months of Abstinence: A Retrospective Look. *Official journal of the American College of Gastroenterology| ACG*, *116*, S536.
9. González Serrano, A., Martínez Tapia, C., de la Taille, A., Mongiat-Artus, P., Irani, J., Bex, A., ... & Canouï-Poitrine, F. (2021). Adherence to Treatment Guidelines and Associated Survival in Older Patients with Prostate Cancer: A Prospective Multicentre Cohort Study. *Cancers*, *13*(18), 4694.
10. Janssen, Q. P., O'Reilly, E. M., Van Eijck, C. H., & Groot Koerkamp, B. (2020). Neoadjuvant treatment in patients with resectable and borderline resectable pancreatic cancer. *Frontiers in oncology*, *10*, 41.
11. Bukhari, M. A., & Alengawi, A. H. (2021). Common Causes of Medication Non-Compliance among Elderly Patients Attending Health Care Center Makkah City, Saudi Arabia in 2021. *Annals of the Romanian Society for Cell Biology*, *25*(7), 2422-2440.
12. Short, G. S. (2021). *Exploring institutional isomorphism at professional accounting programmes* (Doctoral dissertation, North-West University (South Africa)).
13. Guyton, T. (2021). *Correlation of Teacher Perceptions of the Expeditionary Learning and Eureka Math Curricula and Student Achievement* (Doctoral dissertation, Union University).
14. Baldil, O. (2021). *Building Indecisiveness: People's Health Perceptional and Behavioral Trends in Portugal and Turkey* (Doctoral dissertation).

15. Noble, L. M. (2020). Doctor-patient communication and adherence to treatment. In *Adherence to treatment in medical conditions* (pp. 51-82). CRC Press.
16. Oleynick, C. (2020). Recurrent episodes of hypercapnic respiratory failure triggered by panic attacks in a patient with chronic obstructive pulmonary disease. *Respiratory medicine case reports*, *30*, 101044.
17. Lorick-Walker, C. R. (2021). *How Healthcare Administrators in South Carolina Conceive of and Plan to Maintain Productive Operations during a Pandemic* (Doctoral dissertation, Northcentral University).
18. Yousef, A. M., Mohamed, A. E., Eldeeb, S. M., & Mahdy, R. S. (2022). Prevalence and clinical implication of adverse childhood experiences and their association with substance use disorder among patients with schizophrenia. *The Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, *58*(1), 1-11.
19. Mitchell, J. M., Bogenschutz, M., Lilienstein, A., Harrison, C., Kleiman, S., Parker-Guilbert, K., ... & Doblin, R. (2021). MDMA-assisted therapy for severe PTSD: a randomized, double-blind, placebo-controlled phase 3 study. *Nature Medicine*, *27*(6), 1025-1033.
20. Suehs, C. M., Menzies-Gow, A., Price, D., Bleecker, E. R., Canonica, G. W., Gurnell, M., & Bourdin, A. (2021). Expert consensus on the tapering of oral corticosteroids for the treatment of asthma. A Delphi study. *American journal of respiratory and critical care medicine*, *203*(7), 871-881.
21. Walsh, C. A., Cahir, C., Tecklenborg, S., Byrne, C., Culbertson, M. A., & Bennett, K. E. (2019). The association between medication non-adherence and adverse health outcomes in ageing populations: a systematic review and meta-analysis. *British journal of clinical pharmacology*, *85*(11), 2464-2478.
22. Abbas, Y., Tjen, C., & Wicaksono, P. T. (2021). Tax education and tax awareness: A study on the Pajak Bertutur Indonesian tax education program. *J. Australasian Tax Tchrs. Ass'n*, *16*, 198.
23. Farley, H. (2020). Promoting self-efficacy in patients with chronic disease beyond traditional education: A literature review. *Nursing open*, *7*(1), 30-41.
24. Byrne, P., O'Donovan, Ó., Smith, S. M., & Cullinan, J. (2019). Medicalisation, risk and the use of statins for primary prevention of cardiovascular disease: a scoping review of the literature. *Health, Risk & Society*, *21*(7-8), 390-406.
25. Feliu, J., Heredia-Soto, V., Gironés, R., Jiménez-Munarriz, B., Saldaña, J., Guillén-Ponce, C., & Molina-Garrido, M. J. (2020). Management of the toxicity of chemotherapy and targeted therapies in elderly cancer patients. *Clinical and Translational Oncology*, *22*(4), 457-467
26. Mendes, R., Martins, S., & Fernandes, L. (2019). Adherence to medication, physical activity and diet in older adults with diabetes: its association with cognition, anxiety and depression. *Journal of clinical medicine research*, *11*(8), 583.
27. Olowofela, A. O., & Isah, A. O. (2017). A profile of adverse effects of antihypertensive medicines in a tertiary care clinic in Nigeria. *Annals of African medicine*, *16*(3), 114.
28. Miller, J., Campbell, J., Blum, A., Reddell, P., Gordon, V., Schmidt, P., & Lowden, S. (2019). Dose characterization of the investigational anticancer drug tigilanol tiglate (EBC-46) in the local treatment of canine mast cell tumors. *Frontiers in veterinary science*, *6*, 106
29. Jiang, S., Gu, Y., Yang, F., Wu, T., Wang, H., Cutler, H., & Zhang, L. (2020). Tertiary hospitals or community clinics? An enquiry into the factors affecting patients' choice for healthcare facilities in urban China. *China Economic Review*, *63*, 101538.
30. Agasi-Idenburg, C. S., Koning-van Zuilen, M., Westerman, M. J., Punt, C. J., Aaronson, N. K., & Stuiver, M. M. (2020). "I am busy surviving"-Views about physical exercise in older adults scheduled for colorectal cancer surgery. *Journal of geriatric oncology*, *11*(3), 444-450
31. Yin, J., Wang, X., Zhou, L., & Wei, X. (2018). The relationship between social support, treatment interruption and treatment outcome in patients with multidrug-resistant tuberculosis in China: a mixed-methods study. *Tropical Medicine & International Health*, *23*(6), 668-677.
32. Di Lorito, C., Bosco, A., Booth, V., Goldberg, S., Harwood, R. H., & Van der Wardt, V. (2020). Adherence to exercise interventions in older people with mild cognitive impairment and dementia: A systematic review and meta-analysis. *Preventive Medicine Reports*, *19*, 101139.