The attitude and prevalence of patient noncompliance toward chronic disease medications in Saudi Arabia

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ABSTRACT

Background: Failure of patients’ adherence to medications has been a big issue for both physicians and patients; not only it does affect the patients’ health but also it affects the financial status of the hospital and the patient. Objective: This investigation aims to explore the prevalence and the factors affecting the compliance of patients with chronic conditions to their medications. Materials and Methods: An online survey was distributed to patients who had chronic conditions and lived in the main cities of Saudi Arabia. The questionnaire included sections about the patients’ general characters, type of chronic disease, the pattern of prescribed medications’ usage, and factors affecting compliance of patients toward their medications. Data was collected in a predesigned excel sheet, and analysis was executed through SPSS program version 26. Results: 301 patients responded to this questionnaire. The lowest incidence of missing pills was among patients with heart failure, followed by chronic kidney disease, whereas the highest frequency of missing pills was among patients with vitamin D deficiency, followed by hyperlipidemia. 38.5% of the patients used mobile applications as reminders for the administration of their medications. 50% of the patients who use reminders take more than four pills a day. 48.2% of the patients stopped medications without consulting their doctors, where 20.9% stopped one medication for less than a month. 57.5% forgot to take drug doses in a year, with a mean of 8.55 ± 26.3 forgotten doses. Females, patients aging between 31 and 45 years old, obese, married, illiterate, self-employed, those who follow with military hospitals, exercising regularly, and ex-smoker all showed a higher incidence of noncompliance to medications. The main reason for noncompliance was forgetfulness in 60% of patients. 63.2% of the patients did not have a GP to help them with medications compliance. Conclusion: The compliance of Saudi patients toward their chronic medications requires improvement. Similar studies in other areas in Saudi Arabia are recommended.

Keywords: Adherence, chronic disease, medication compliance, patient

Introduction

Chronic conditions are considered the leading cause of morbidity globally.[1] They can cause a significant reduction in the patients’ quality of life.[2] In addition, they can represent significant risk factors for other conditions.[3] The incidence of chronic diseases is considered high not only in developing countries but also in developed countries.[4]

Common chronic conditions include diabetes, hypertension, asthma, thyroid disorders (hypo or hyperthyroidism), and other cardiac and endocrine conditions.[5] Patients with chronic diseases are more likely to have more than one condition.[6] Consequently, these patients usually have what is described as “poly pharmacy” due to the administration of multiple medications.[7]

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The compliance of patients with chronic conditions toward their medications can be affected by multiple factors. Furthermore, these patients are at notably higher risk of toxicity from medication due to medication errors or noncompliance. Another critical issue is that these patients are usually elderly, and they might not have someone to help them with their medications.

In addition, patients’ psychological condition and their perception of their disease can affect their compliance to medications. Some patients might think that because their condition is incurable, their disease can not be controlled, and there is no benefit from administering medications. Also, some patients might have financial problems that might affect the purchase of their medications.

Therefore, this study’s objective is to understand the factors that affect the attitude of chronic disease patients and the prevalence of compliance toward their medical treatment in Saudi Arabia.

Materials and Methods

Study design
This is a cross-sectional observational study conducted in the main cities of Saudi Arabia through an online questionnaire that was distributed online to patients with chronic conditions and lived in Saudi Arabia.

The validity of our questionnaire was established by experts and it was pilot tested on a subset of participants.

Data collection
A self-administered online questionnaire was disseminated online to patients with chronic conditions. The survey mainly focused on the general characters of the patients, type of chronic condition, the pattern of the usage of prescribed medications, and the factors affecting patients’ compliance toward their medications. All responses were then collected in a predesigned excel sheet.

Statistical analyses
Data were expressed as frequencies and percentages for categorical variables and as means and standard deviations for continuous variables. IBM SPSS (Statistical Package for the Social Science; IBM Corp, Armonk, NY, USA) was used to carry out all statistical analyses, version 26 for Microsoft Windows.

Ethical considerations
Informed consent was shown on the initial page of the questionnaire and all participants were provided with detailed information about the study, and only those who accepted to consent were recruited. Confidentiality was maintained. Ethical approval was obtained from Imam Mohammed Ibn Saud Islamic University IRB committee before the beginning of the study.

Results
Three hundred and one patients responded to this questionnaire mainly from Riyadh. Only participants who finished all the questions in the survey were included. The demographics of participants and analysis of the questionnaire are shown in Table 1.

General characters of responders
Out of 301 patients, females represented 68.8% of the patients. Age was subcategorized into three age groups starting from 15 years old and 45 years old. The most prevalent age group was the one above 45 years old (43.9%). As for body mass index, 39.9% of the whole cohort were obese.

In addition, 68.1% were married, 47.5% had a bachelor’s degree, and 34.6% were employed. Furthermore, 86% of the patients have never smoked, and 42.5% had health insurance from the ministry of health. All demographic data are shown in detail in Table 1.

Medications compliance among patients
The frequency of missed pills was identified over different chronic conditions among the included patients. It has been shown that the lowest incidence of missing pills was among patients with heart failure, followed by chronic kidney disease, whereas the highest frequency of missing pills was among patients with vitamin D deficiency, followed by hyperlipidemia.

Moreover, the distribution of chronic conditions among patients has been examined. The most prevalent chronic condition was vitamin D deficiency, followed by hyperlipidemia, while the least common chronic condition was heart failure followed by chronic kidney disease as shown in Figure 1.

Pills are taken daily
Participants were also asked about the number of pills administered on a daily basis. 41.9% of the patients administered pills once daily, while 0.7% of patients administered pills more than four times daily, as shown in Table 2.

Use of reminders
Patients were asked about their use of reminders. Regarding the type of reminders use, 38.5% of the patients use mobile applications as reminders for the administration of their medications, while only 7.3% use phone alarms as shown in Table 3.

As for the relation between the number of pills administered and the use of reminders, patients taking more than four pills a day are the most common to use reminders (50%), while those taking four pills per day are the least common to use reminders as shown in Figure 2.

Adherence level among participants
The adherence of patients was also assessed. 48.2% of the patients stopped medications without consulting their doctors, where 20.9% stopped one medication for less than a month. Furthermore, 55.8% of the patients were able to refill medication in a year regularly without problems.
On the other hand, 57.5% forgot to take drug doses, with a mean of 8.55 ± 26.3 forgotten doses in a year, as shown in Table 4.

### Risk factors for noncompliance

Different socio-demographic variables were examined to explore the factors influencing noncompliance in chronic patients. Females showed a higher incidence of noncompliance (52.2%), and patients aging between 31 and 45 years old, obese patients, married patients, illiterate, self-employed, patients with military health insurance, those who are exercising regularly, and ex-smoker all showed a higher incidence of noncompliance to medications as shown in Table 5.

### Reasons for noncompliance

Patients were also asked about the reasons behind their noncompliance to medications. The most common reason for noncompliance was forgetfulness in more than 60% of patients, as shown in Figure 3.

### Reasons for noncompliance in terms of the patient-physician relationship

It has been shown that 56.2% of noncompliant patients follow two physicians; also, 57.5% of the noncompliant patients had a clear education about their management plan, and 47.9% of them had an average relationship with their physicians. Furthermore, 63.2% of the patients did not have a GP to help them stick to the medication plan, as shown in Table 6.

In addition, the reasons for the inability to refill medications were explored, where the most common reason was forgetfulness in 30% of patients, followed by long waiting for appointments, as shown in Figure 4.

### Discussion

Patients with chronic conditions can have more than one type of medications.\(^{(13)}\) This is known as polypharmacy and can increase the risk of confusion or noncompliance to medications' administration. Consequently, it can increase the risk of toxicity, especially in the elderly population.\(^{(14)}\) Hence, it is crucial to understand the factors influencing noncompliance to medications in patients with comorbid conditions to reduce the incidence of complications and toxicity.\(^{(15)}\)

The present study aimed to evaluate patients' attitudes and risk factors that affect the compliance with chronic disease medications in the main cities of Saudi Arabia. The study demonstrated that the lowest incidence of missing pills was...
The attitude of patient noncompliance

Altamimi, et al. among patients with heart failure, followed by chronic kidney disease. The highest frequency of missing pills was among patients with vitamin D deficiency, followed by hyperlipidemia.

Some patients also used reminders for their medications; 38.5% used mobile applications as reminders for the administration of their medications, and those taking over four pills a day were the most common to use reminders (50%). 48.2% of the patients stopped medications without consulting their doctors, where 20.9% stopped one medication for less than a month. 57.5% forgot to take drug doses in a year, with a mean of 8.55 ± 26.3 forgotten doses.

As for the risk factors to noncompliance to medications, females, patients aging between 31 and 45 years old, obese, married, illiterate, self-employed, patients with military health insurance, those who are exercising regularly, and ex-smoker all showed a higher incidence of noncompliance to medications. The main reason for noncompliance was forgetfulness in 60% of patients. 63.2% of the patients did not have a GP to help them stick to the medication plan.

Figure 1: Spread of chronic diseases among participants and frequency of missing pills in relation to each disease

Figure 2: Correlation between the numbers of pills used daily and the need to use a reminder
Compliance with chronic disease medications has been investigated in different care settings. Shamkuwar et al.\cite{16} evaluated the attitude toward medication compliance in Indian patients. Through interviewing patients presenting to a tertiary hospital, Shamkuwar et al.\cite{16} demonstrated that the knowledge of patients toward their disease was low, which resulted in a low level of adherence to their medical treatment.

Although the present study did not investigate patients’ knowledge toward their disease, the compliance toward chronic medications was considered low. The highest incidence of missing pills was among patients with vitamin D deficiency, followed by hyperlipidemia. Also, 48.2% of the patients stopped medications without consulting their doctors.

Furthermore, Pages-Puigdemont et al.\cite{17} examined patients’ perceptions of compliance with chronic disease medications in 36 patients and showed that there are multiple factors affecting patients’ compliance, the most important of which is the patient-physician relationship.

Similarly, the present study showed that 63.2% of the patients did not have a GP to help them stick to the medication plan. Also, only 47.9% of them had an average relationship with their physicians. This should encourage the improvement of the relationship between patients and physicians.

In addition, Abebaw et al.\cite{18} evaluated the adherence of diabetic patients toward their medications in Ethiopia. They revealed a low level of adherence to diabetes medications in 20% of patients and showed that knowledge about the disease is the most significant factor affecting medication adherence.

And as for hypertension, a recent study by Roka et al.\cite{19} in 2020 has shown that 72% of the patients had decreased adherence to anti-hypertensive medications, mostly among females (77%); factors that aided in this were having multiple comorbidities, getting the medication for free, and no follow up or check ups with their regular family physician or GP.\cite{19}

The present study also showed an unsatisfactory level of compliance toward chronic medications. The most common factors affecting adherence are gender (females), middle-age (31 to 45 years old), obesity, marriage, illiteracy, and ex-smoking.

The limitation of the present study: the participants’ responses depend only on their honesty and subjective opinions, which might affect the reliability of the results. This is the first study to assess medication compliance behaviors in Saudi Arabia.
Table 5: Factors affecting medication compliance

| Characteristics of the study group | Compliant n=145 | Noncompliant n=156 |
|-----------------------------------|----------------|-------------------|
| Gender                            |                |                   |
| Male                              | 46 (48.9%)     | 48 (51.1%)        |
| Female                            | 99 (47.8%)     | 108 (52.2%)       |
| Age                               |                |                   |
| 15-30 years                       | 45 (52.3%)     | 41 (47.7%)        |
| 31-45 years                       | 38 (45.8%)     | 45 (54.2%)        |
| Above 45 years                    | 62 (47)        | 70 (53.0%)        |
| Body Mass Index (BMI)             |                |                   |
| Underweight (<18.5 kg/m²)         | 7 (46.7%)      | 8 (53.3%)         |
| Normal (18.5-24.99 kg/m²)         | 35 (46.7%)     | 40 (53.3%)        |
| Overweight (25-29.99 kg/m²)       | 40 (44.0%)     | 51 (56.0%)        |
| Obese (>30 kg/m²)                 | 63 (52.5%)     | 57 (47.5%)        |
| Social Status                     |                |                   |
| Single                            | 36 (48.6%)     | 38 (51.4%)        |
| Married                           | 97 (47.3%)     | 108 (52.7%)       |
| Separated                         | 8 (57.1%)      | 6 (42.9%)         |
| Widowed                           | 4 (50%)        | 4 (50%)           |
| Education                         |                |                   |
| Illiterate                        | 3 (30.0%)      | 7 (70.0%)         |
| Literate                          | 1 (50.0%)      | 1 (50.0%)         |
| Primary-Preparatory degree        | 11 (55.0%)     | 9 (45%)           |
| Secondary degree                  | 21 (46.7%)     | 24 (53.3%)        |
| Post-High school                  | 16 (57.1%)     | 12 (42.9%)        |
| Some college with no degree       | 13 (59.1%)     | 9 (40.9%)         |
| Bachelor degree                   | 70 (49%)       | 73 (51%)          |
| Master degree                     | 7 (30.4%)      | 16 (69.6%)        |
| Doctorate degree or equivalent    | 3 (37.5%)      | 5 (62.5%)         |
| City                              |                |                   |
| Riyadh                            | 96 (%)         | 109 (%)           |
| Qassim                            | 8 (47.1%)      | 9 (52.9%)         |
| Jeddah                            | 8 (53.3%)      | 7 (46.7%)         |
| Others                            | 33 (51.6%)     | 31 (48.4%)        |
| Employment status                 |                |                   |
| Student                           | 24 (46.2%)     | 28 (53.8%)        |
| Unemployed                        | 51 (49.0%)     | 53 (51.0%)        |
| Employed                          | 19 (59.4%)     | 13 (40.6%)        |
| Housewife                         | 17 (56.7%)     | 13 (43.3%)        |
| Self-employment                   | 6 (35.3%)      | 11 (64.7%)        |
| Retired                           | 39 (59.1%)     | 27 (40.9%)        |
| Smoking                           |                |                   |
| Never smoked                      | 123 (47.5%)    | 136 (52.5%)       |
| Ex-smoker                         | 7 (46.7%)      | 8 (53.3%)         |
| Current smoker                    | 15 (55.6%)     | 12 (44.4%)        |
| Exercise                          |                |                   |
| Not exercising regularly          | 63 (47.0%)     | 71 (53.0%)        |
| Exercising occasionally           | 70 (50.0%)     | 70 (50.0%)        |
| Exercising regularly              | 12 (44.4%)     | 15 (55.6%)        |
| Health Insurance                  |                |                   |
| Ministry of health                | 61 (47.7%)     | 67 (52.3%)        |
| Military health insurance         | 28 (41.8%)     | 39 (58.2%)        |
| University Health insurance       | 11 (42.3%)     | 15 (57.7%)        |
| Private healthcare sector through private insurance | 45 (49.5%) | 46 (50.5%)        |
| Private healthcare sector through private cash | 37.56.1 (%) | 29 (43.9%)        |

Conclusion

The practices and behaviors of Saudi patients in main cities of Saudi Arabia toward chronic disease medications are unsatisfactory and require improvement. The awareness of patients toward their medications and their diseases also need
Table 6: Factors of noncompliance among participants in terms of the patient-physician relationship

| Characteristics of the study group | Compliant n=145 | Noncompliant n=156 |
|-----------------------------------|----------------|-------------------|
| Number of physicians followed     |                |                   |
| No                                | 4 (44.4%)      | 5 (55.6%)         |
| One                               | 84 (46.4%)     | 97 (53.6%)        |
| Two                               | 28 (43.8%)     | 36 (56.2%)        |
| Three                              | 21 (63.6%)     | 12 (36.4%)        |
| Four                               | 2 (50.0%)      | 2 (50.0%)         |
| More than four                     | 6 (60.0%)      | 4 (40.0%)         |
| Education about the management plan|               |                   |
| No                                 | 20 (57.1%)     | 15 (42.9%)        |
| Unequal                            | 11 (91.7%)     | 1 (8.3%)          |
| Bad-poor                           | 23 (50.0%)     | 16 (41.0%)        |
| Not applicable                     | 0 (0%)         | 1 (100.0%)        |
| Clear                              | 91 (42.5%)     | 123 (57.5%)       |
| Relationship with physicians       |               |                   |
| Good                               | 82 (44.1%)     | 104 (44.9%)       |
| Average                            | 49 (52.1%)     | 45 (47.9%)        |
| Bad                                | 14 (66.7%)     | 7 (33.3%)         |
| Having GP                          |               |                   |
| Yes                                | 115 (49.1%)    | 119 (50.9%)       |
| No                                 | 7 (36.8%)      | 12 (63.2%)        |
| I don’t know                       | 23 (47.9%)     | 25 (52.1%)        |
| GP helped in sticking to the plan  |               |                   |
| Yes                                | 115 (49.1%)    | 119 (50.9%)       |
| No                                 | 7 (36.8%)      | 12 (63.2%)        |

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Conflicts of interest

There are no conflicts of interest.

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