Original Article

Factors related to adherence to drug treatment in public university workers

Fatores associados à adesão ao tratamento medicamentoso em trabalhadores de universidade pública

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ABSTRACT

Objective: to analyze factors associated with medication adherence among public university workers who reported use of continuous medication. **Methods:** cross-sectional study carried out with 629 workers from a public university. Data were collected through interviews using forms adapted from the Brazilian Ministry of Health and analyzed using the chi-square test. **Results:** three hundred thirty-one (52.6%) participants were users of continuous medication, of these, 175 (52.9%) had a partially satisfactory adherence pattern and 156 (47.1%) a totally satisfactory pattern. Workers with chronic back problems, depression, weakness/tiredness, dyspnea, and chest pain had significantly less adherence to drug treatment (p≤0.050). Sociodemographic and labor characteristics, polypharmacy, and type of medication were not associated with medication adherence (p>0.050). **Conclusion:** satisfactory drug adherence was observed among the participants in relation to drug treatment, and the presence of some symptoms and specific chronic diseases was associated with partially satisfactory drug adherence.
Descriptors: Patient Compliance; Drug Administration Schedule; Occupational Groups; Risk Factors; Medication Adherence.

RESUMO

Objetivo: analisar fatores associados à adesão medicamentosa entre trabalhadores de universidade pública que referiram uso de medicação contínua. **Métodos**: estudo transversal, desenvolvido junto a 629 trabalhadores de instituição pública de ensino superior. Dados coletados mediante entrevistas com formulários adaptados do Ministério da Saúde brasileiro e analisados pelo teste qui-quadrado. **Resultados**: verificou-se que 331 (52,6%) dos participantes utilizavam medicação contínua, destes, 175 (52,9%) apresentaram padrão de adesão parcialmente satisfatória e 156 (47,1%) totalmente satisfatória. Trabalhadores com problema crônico de coluna, depressão, fraqueza/cansaço, dispneia e dor no peito apresentaram significativamente menor adesão ao tratamento medicamentoso (p≤0,050). Características sociodemográficas e laborais, polifarmácia e tipo de medicamento não se mostraram associados à adesão medicamentosa (p>0,050). **Conclusão**: observou-se adesão satisfatória entre os trabalhadores pesquisados em relação ao tratamento medicamentoso, estando a presença de alguns sintomas e as doenças crônicas específicas associados à adesão medicamentosa parcialmente satisfatória.
Descritores: Cooperação do Paciente; Esquema de Medicação; Categorias de Trabalhadores; Fatores de Risco; Adesão à Medicação.

Introduction

Patient's adherence to drug therapy for the control of chronic non-communicable diseases is a paradigm to be ended, in which the drug therapy is prescribed as an attempt to improve the patient's quality of life and prognosis[1]. Adherence to treatment refers to the degree of agreement and understanding between patient and prescriber, and a rate of at least 80.0% of medication use is a commonly used attribute to specifically measure medication adherence[2].

The World Health Organization considers that, in developed countries, non-adherence to long-term therapies is around 50.0%, and this value is higher in less developed countries[3], which is also seen in Brazil[2]. Despite these trends, in Brazil, there are no numbers that provide a reliable profile about non-adherence to medication, based on studies with national representativeness[4], making it difficult to establish effective public health prevention policies.

When considering medication adherence as a multidimensional and socioculturally determined phenomenon, health team attitudes should also contribute to foster patient adherence promoting less complex therapeutic schemes[5], providing clear information about the disease[6], benefits and side effects of treatment, and considering the patient's cognitive capacity and access to treatment.

As a result of non-adherence to medication, there is often a worsening of the population's health status, with consequences on the number of hospitalizations, increased morbidity and mortality, premature deaths, and decreased control of chronic diseases[2].

Considering, in particular, the universe of labor relationships, which is the focus of the present study, an important point in the course of drug treatment is the individual's professional occupation which, many times, reveals itself as a complicating factor for pharmacological adherence. Extensive workload or even complications during work can negatively affect pharmacological treatment, as they coincide with periods established for medication administration[7].

In this sense, although there are studies that deal with medication adherence in chronic patients, few have been dedicated to the public of workers, and no study that addressed the same issue with workers from a higher education institution was found. Thus, the importance of this research is justified, so that educational institutions, through information collected and tabulated on workers' health, act in a precautionary manner and invest in health-promoting strategies aiming at the work environment as an exponential factor in the health-disease process.

Given the above, the objective of this study was to analyze factors associated with medication adherence among public university workers who reported use of continuous medication.

Methods

A cross-sectional study was carried out with 629 workers from a Brazilian public university in Paraná, Brazil. From a total of 629 workers evaluated, the following inclusion criteria were considered: using continuous medication and having been answered the medication adherence form, resulting in a final sample of 331 subjects.

The data collection was carried out using two forms created especially for the study, based on instruments proposed by the Brazilian Ministry of Health for the population situational health diagnosis and primary care protocols for chronic non-transmissible conditions[8-9]. One form contemplated sociodemographic and labor characteristics (gender, age, marital status, ethnic group, education, income, employment relationship, and work regime), previous medical diagnoses (hypercholesterolemia, hypertension, depression, diabetes, chronic back problem, arthritis/rheumatism, and work-related musculoskeletal disorders), symptoms (weakness/tiredness, headache, chest pain during climbing, and dyspnea), and use of continuous medication (description of medications).

The second form considered drug treatment adherence measures based on the Brazilian Ministry

of Health's instrument validated in 1986 by a group of American researchers[10]. This instrument has five yes and no questions ranging from zero (inadequate condition) to one (adequate condition), as follows: Over the past two weeks, were there any days when you did not take your medicines? Have you ever cut back or stopped taking your medication without telling your doctor because you felt worse when you took it? Do you take your medications at the indicated hour? When you are well, do you stop taking the medication? If you feel bad, do you stop taking it?

To obtain the drug adherence standard, the resulting values are summed and the following classification is used: totally satisfactory adherence - score 5 (maximum value), and partially satisfactory adherence - other scores. We chose to dichotomize the adherence outcome variable in this way since most of the participants achieved scores of 5 (n=156; 47.1%) and 4 (n=122; 37.0%). In addition, no subject scored zero, which characterizes non-adherence.

Data were collected respecting ethical principles, from November/December 2018 to February/March 2019, during working hours, by a previously trained multidisciplinary health team.

Adherence to drug treatment was estimated as a dependent variable. The independent variables were sociodemographic and work characteristics, clinical symptoms, previous medical diagnoses, frequency of medication use, and main drugs for continuous use. To test the association between the dependent and the independent variables, a bivariate analysis was performed using the chi-square test at a significance level of 5%.

The research was approved by the Research Ethics Committee of the university in which the study was undertaken according to opinion No. 3,056,856/2018 and Certificate of Presentation for Ethical Appreciation No. 99995518.4.0000.0105, respecting the Resolution 466/12 of the Brazilian National Health Council and the Declaration of Helsinki.

Results

From the total participants, 331 (52.6%) used continuous medications. From these, 156 (47.1%) had a totally satisfactory adherence. The prevalence of scores with partially satisfactory adherence totaled 52.9%, with score 4 accounting for 122 (69.7%) of this value and score 3 for 42 (24.0%). Table 1 shows the participant workers' sociodemographic and labor profile according to medication adherence, and the absence of significant associations (p>0.050).

Table 1 – Sociodemographic and labor profile of workers from a public university, according to medication adherence. Ponta Grossa, PR, Brazil, 2018 (n=331)

Variables	Full adherence	Partial adherence	Total	p-value*
	n (%)	n (%)	n (%)	
Gender				
Female	91 (58.3)	111 (63.4)	202 (61.0)	0.343
Male	65 (41.7)	64 (36.6)	129 (39.0)	
Age (years)				
18-30	10 (6.4)	5 (2.9)	15 (4.5)	0.246
31-40	12 (7.7)	20 (11.4)	32 (9.7)	
41-50	43 (27.6)	53 (30.3)	96 (29.0)	
51-60	65 (41.7)	77 (44.0)	142 (42.9)	
> 60	26 (16.7)	20 (11.4)	46 (13.9)	
Marital status				
Single	37 (23.7)	27 (15.4)	64 (19.3)	0.113
Married or cohabiting	90 (57.7)	105 (60.0)	195 (58.9)	
Other	29 (18.6)	43 (24.6)	72 (21.8)	
Ethnic group				
Caucasian	131 (84.0)	139 (79.4)	270 (81.6)	0.287
Other groups	25 (16.0)	36 (20.6)	61 (18.4)	
Education				
Up to high school	69 (44.2)	84 (48.0)	153 (46.2)	0.492
Higher education or above	87 (55.8)	91 (52.0)	178 (53.8)	
Income (minimum wages)				
≤ 2,000.00	21 (13.5)	20 (11.4)	41 (12.4)	0.820
2,001.00 - 3,000.00	20 (12.8)	23 (13.1)	43 (13.0)	
3,001.00 - 4,000.00	35 (22.4)	49 (28.0)	84 (25.4)	
4,001.00 - 5,000.00	38 (24.4)	39 (22.3)	77 (23.3)	
5,001.00 - 7,000.00	22 (14.1)	19 (10.9)	41 (12.4)	
> 7,001.00	19 (12.2)	23 (13.1)	42 (12.7)	
Type of employement contract				
Tender	153 (87.4)	135 (86.5)	288 (87.0)	0.810
Registered job	22 (12.6)	21 (13.5)	43 (13.0)	
Work regime (hours)				
20	2 (1.14)	4 (2.56)	6 (1.81)	0.430
40	173 (98.9)	152 (97.4)	325 (98.1)	

*Chi-square test

The variables number of drugs used per day, polypharmacy, and use of the most used drugs were also not associated with medication adherence (p>0.050). Regarding the symptoms presented by the participants, it was found that workers who presented weakness/tiredness, dyspnea, and chest pain had significantly less adherence to drug treatment (p≤0.050) (Table 2).

Table 2 – Profile of continuous medication use and symptoms presented by workers from a public university, according to medication adherence. Ponta Grossa, PR, Brazil, 2018 (n=331)

Variables	Full adherence n (%)	Partial adherence n (%)	Total n (%)	p-value*
Number of drugs used daily				
≤ 2	84 (53.8)	107 (61.1)	191 (57.7)	0.319
> 3	72 (46.2)	68 (38.8)	140 (42.3)	
Antihypertensive/ Diuretic drugs				
No	74 (47.4)	88 (50.3)	162 (48.9)	0.660
Yes	82 (52.6)	87 (49.7)	169 (51.1)	
Antidepressant drugs				
No	119 (76.3)	126 (72.0)	245 (74.0)	0.375
Yes	37 (23.7)	49 (28.0)	86 (26.0)	
Dyslipidemic drugs				
No	117 (75.0)	137 (78.3)	254 (76.7)	0.480
Yes	39 (25.0)	38 (21.7)	77 (23.3)	
Antidiabetic drugs				
No	122 (78.2)	142 (81.1)	264 (79.8)	0.507
Yes	34 (21.8)	33 (18.9)	67 (20.2)	
Weakness/tiredness				
Yes	53 (34.0)	78 (44.6)	131 (39.6)	0.050
No	103 (66.0)	97 (55.4)	200 (60.4)	
Headache				
Yes	42 (26.9)	63 (36.0)	105 (31.7)	0.070
No	114 (73.1)	112 (64.0)	226 (68.3)	
Dyspnea				
Yes	23 (14.7)	50 (28.6)	73 (22.1)	0.002
No	133 (85.3)	125 (71.4)	258 (77.9)	
Chest pain				
Yes	18 (11.5)	35 (20.0)	53 (16.0)	0.040
No	138 (88.5)	140 (80.0)	278 (84.0)	

*Chi-square test

The following diseases were significantly associated with medication adherence: chronic spine conditions (p=0.050) and depression (p=0.030). People who had these conditions adhered less efficiently to the treatment (Table 3).

Table 3 – Self-reported medical conditions of workers from a public university, according to medication adherence. Ponta Grossa, PR, Brazil, 2018 (n=331)

Variables	Full adherence n (%)	Partial adherence n (%)	Total n (%)	p-value*
Arterial hypertension				
Yes	70 (44.9)	75 (42.9)	145 (43.8)	0.712
No	86 (55.1)	100 (57.1)	186 (56.2)	
Chronic spine condition				
Yes	74 (47.4)	102 (58.3)	176 (53.2)	0.050
No	82 (52.6)	73 (41.7)	155 (46.8)	
Hypercholesterolemia				
Yes	59 (37.8)	62 (35.4)	121 (36.6)	0.652
No	97 (62.2)	113 (64.6)	210 (63.4)	
Depression				
Yes	40 (25.6)	64 (36.6)	104 (31.4)	0.030
No	116 (74.4)	111 (63.4)	227 (68.6)	
Diabetes				
Yes	33 (21.2)	32 (18.3)	65 (19.6)	0.521
No	123 (78.8)	143 (81.7)	266 (80.4)	
Arthritis/rheumatism				
Yes	26 (16.7)	37 (21.1)	63 (19.0)	0.300
No	130 (83.3)	138 (78.9)	268 (81.0)	
Work-related musculoskeletal disorders				
Yes	17 (10.9)	24 (13.7)	41 (12.4)	0.440
No	139 (89.1)	151 (86.3)	290 (87.6)	

*Chi-square test

Discussion

As a limitation of this study, in addition to those relevant to the cross-sectional methodological design, the choice of active workers as an eligibility criterion disregarded subjects who were on leave, absent or on leave due to health reasons and thus the results may have been biased by participants being healthy, also

leading to a lack of knowledge about the profile of workers on leave. In addition, the responses inherent to the presence of diseases and medication adherence were self-reported.

However, the results found are of great relevance, as they portray the reality of the active public workers and contribute to clinical practice and research on workers' health conditions, highlighting the importance of studies that demonstrate strategies aimed at education, supervision, and motivation for effective drug adherence and non-abandonment of pharmacological therapy, with a special and fundamental role of the nursing team to succeed in this proposal, especially in the context of primary health care.

The frequency of unsatisfactory adherence to drug treatment for chronic non-communicable diseases, reported by the participant workers found in the present study is similar to that found in the national and international literature[1-4]. The low adherence values can be even higher, since it is difficult to define a measurable adherence threshold as the findings may have bias in response and also depend on factors beyond the context inherent to the pattern reported by patients, including pharmacological characteristics of prescribed drugs and disease-related variables such as time and severity[1].

Workers with dyspnea were more likely to not adhere fully to the medication therapy, a condition that is consistent with the literature that points out that non-adherence to medication is highly prevalent among individuals who undergo treatment for cardiovascular risk factors[1], as well as a highly complex therapeutic regimen[3-4].

An overly complex therapeutic regimen is frequent in the therapeutic routine of individuals with chronic diseases. The use of statins alone has the adverse effect of difficulty breathing[11]. In addition, a longitudinal clinical trial study found a relationship between highly complex therapeutic regimen and dyspnea, in which each additional medication was associated with an increased risk frequency of 8.0% and 16.0% for mild dyspnea and moderate-severe, respectively[12], which may explain the relationship between

medication adherence and dyspnea found in the present study.

The aforementioned hypothesis may also explain the presence of other symptoms reported by the workers, which was also related with adherence. In addition to dyspnea, researchers also warn of the presence of weakness and immobility related to the use of statin[13], a fact that corroborates the results found in the present study in which 39.6% of workers reported feeling weak/tired.

In addition, a highly complex therapeutic regimen strongly brings the interaction of substances prescribed and used concomitantly, which can trigger some side effects, such as headache and changes in respiratory and cardiac rates or rhythms. Still, these conditions can be intensified with inappropriate use of medication or constitute reasons for not adhering to the prescribed medication[14]. In the treatment of hypertension, it is common for individuals to stop properly following the prescribed pharmacotherapeutic plan when they experience side effects such as nausea, headache, frequent urination and others, reinforcing our findings on medication adherence and symptoms.

A similar condition may be occurring with individuals who use diuretics, since a significant portion of the sample presented fatigue and lassitude in addition to the side effect of constipation and frequent urination. In general, diuretics, without assigning a specific class, can trigger hypokalemia. This hydroelectrolytic disorder, when in its most severe form, causes mild to severe nonspecific symptoms, such as ventilatory impairment due to low concentration of potassium, and the occurrence of non-favorable clinical manifestations[15], favoring non-adherence to treatment.

Research carried out in a similar public reports the existence of different job profiles in public universities, most of which are represented by passive work, that is, employees who spend most of their time sitting or working in functions that do not require excessive physical strength. Passivity is considered the second most problematic risk factor as it can, among other consequences, predispose to physical inactivity[16]. This condition, in addition to the incorrect use

of medication, can further favor the appearance of symptoms such as weakness/tiredness, chest pain, and dyspnea, strengthening the relationship found between these factors and inadequate medication adherence.

Another factor associated with inadequate medication adherence found in the present study was depression. Depression is closely linked to loss of interest in habits, work, and self-care activities that were previously easy and pleasant to perform. The intentional abandonment of pharmacological therapy against depression can cause an unnecessary increase in the dosage of antidepressants and decompensation of the disease[17].

Regarding adherence to pharmacological treatment with antidepressants in adults, a research confirms that 50.0% of respondents did not adhere to treatment[18]. These data reveal resistance to therapeutic follow-up, exposing an ambiguous relationship between depressive symptoms and self-care, with dissatisfaction with the side effect and expression of lack of support and knowledge about the disorder and its treatment, in addition to difficult and stressful task of maintaining the medication routine. This challenge of maintaining antidepressant therapy and the relationship with poor adherence and abandonment of the therapy corroborate the results found in the present study.

In relation to chronic spine conditions, partial adherence to medication therapy may be related to social stigmas of the disease, which relate pain or discomfort to a common and underestimated condition among workers, and to factors resulting from the worker' condition itself. In addition to the relationship with work activities, a population-based Brazilian survey points the following factors as the most strongly associated with chronic back pain in adults: advanced age, low education, history of smoking, high salt consumption, overweight and obesity, and presence of chronic diseases[19].

In the adult working population, untreated chronic back pain often generates disability, reduced functionality, and absence from work, in addition to the demand for health services, exams, medications, physical therapy, hospitalizations, and surgeries[20].

Conclusion

Satisfactory adherence to pharmacotherapy was found in public university workers who reported use of continuous medication. The presence of weakness/tiredness, dyspnea, chest pain, and chronic illnesses, depression, and spine conditions were associated with unsatisfactory medication adherence.

Collaborations

Lima LP and Almeida PF contributed to the writing of the article. Fadel CB, Cabral LPA, and Krum EA collaborated with relevant critical review of intellectual content. Bordin D participated in the study design, analysis and interpretation of data, and final approval of the manuscript to be published.

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