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Patient-Reported Outcomes

Predictors of Self-Reported Adherence to Antihypertensive Medicines: A Multinational, Cross-Sectional Survey

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ABSTRACT

Background: Nonadherence to antihypertensive medicines limits their effectiveness, increases the risk of adverse health outcome, and is associated with significant health care costs. The multiple causes of nonadherence differ both within and between patients and are influenced by patients' care settings. **Objectives:** The objective of this article was to identify determinants of patient nonadherence to antihypertensive medicines, drawing from psychosocial and economic models of behavior. **Methods:** Outpatients with hypertension from Austria, Belgium, England, Germany, Greece, Hungary, The Netherlands, Poland, and Wales were recruited to a cross-sectional online survey. Nonadherence to medicines was assessed using the Morisky Medication Adherence Scale (primary outcome) and the Medication Adherence Rating Scale. Associations with adherence and nonadherence were tested for demographic, clinical, and psychosocial factors. **Results:** A total of 2595 patients completed the questionnaire. The percentage of patients classed as nonadherent ranged from 24% in The Netherlands to 70% in Hungary. Low age, low self-efficacy, and respondents' perceptions of their illness and cost-related barriers were associated with nonadherence measured on the Morisky Medication Adherence Scale across several countries. In multilevel, multivariate analysis, low self-efficacy (odds ratio = 0.73; 95% confidence interval 0.70–0.77) and a high number of perceived barriers to taking medicines (odds ratio = 1.70; 95% confidence interval 1.38–2.09) were the main significant determinants of nonadherence. Country differences explained 11% of the variance in nonadherence. **Conclusions:** Among the variables measured, patients' adherence to antihypertensive medicines is influenced primarily by their self-efficacy, illness beliefs, and perceived barriers. These should be targets for interventions for improving adherence, as should an appreciation of differences among the countries in which they are being delivered.

Keywords: adherence, behavioral economics, health psychology, hypertension, self-efficacy.

Introduction

Adherence to antihypertensive treatments is suboptimal [1], even among patients participating in clinical studies, whose median persistence with medicines is only about 1 year [2]. Patients who are poorly adherent (proportion of days covered ≤40%) [3] experience significantly increased risk of acute cardiovascular events, compared with those who adhere adequately (≥80%), and incur greater health care costs [4]. The World Health Organization [5] has called for further research to gain a better understanding of the determinants of nonadherence to antihypertensive medicines, and to identify common risk factors for nonadherence across different countries, to inform strategies for improving patient adherence.

Known determinants of nonadherence to antihypertensive treatments may broadly be categorized as factors related to the patients [6–9] and their familial and cultural context [10], condition [11], treatment [8,11], socioeconomic characteristics, and health professional/health care system [5,12]. Components of sociocognitive and self-regulatory theory including attitude [13], perceived behavioral control [13,14], low self-efficacy [13,15,16], lack of perceived treatment benefits [11], perceived barriers [7,8], illness perceptions [6,10], beliefs about medicines [6,11,17,18], and lack of social support [10,19,20] are significantly associated with

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nonadherence. Studies based on the consumer demand theory support the negative impact of the costs of medicines on adherence [21], but there is a lack of empirical evidence on alternative behavioral economic theories such as time preference. We are unaware of any study in which a range of these factors has been tested simultaneously to assess their combined contribution to nonadherence across several countries.

The aim of this study, therefore, was to identify determinants of patient nonadherence to antihypertensive medicines, drawing from psychosocial and economic models of behavior, from a cross-sectional survey across a number of European countries with contrasting cultures, health care systems, and patient characteristics.

Methods

The research used an online, convenience cross-sectional sample of adults with hypertension recruited from 11 European countries. We tested the contribution of multiple, theory-driven determinants for association with antihypertensive treatment nonadherence, and reported our findings according to the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE) statement on cross-sectional studies [22].

Procedure

After receipt of ethical approval from all relevant committees, we invited ambulatory, adult patients with hypertension to participate in an online questionnaire. Patients self-selected into this study in response to advertisements placed in community pharmacies (Austria, Belgium, England, France, Germany, Greece, The Netherlands, Portugal, Poland, and Wales) or hypertension clinics (Hungary). Additional strategies were necessary to increase recruitment in some countries. These included recruiting patients via general practice surgeries (Poland and Hungary), placing advertisements in the press (England and Wales), and using online patient support groups (Poland). No incentive was offered for patients to participate. The survey was administered anonymously through SurveyMonkey, with one entry allowed per Internet Protocol address to reduce the chance of multiple responses. Patient information sheets, consent forms, and eligibility checks were provided online.

Inclusion Criteria

We included patients who consented, and who self-reported as being 18 years or older, diagnosed by a doctor as having hypertension that lasted at least 3 months, currently prescribed antihypertensive medicine(s), and personally responsible for administering their medicines.

Exclusion Criteria

Respondents who self-reported as being diagnosed with a "psychiatric condition" or those living in a nursing home (or similar facility) were excluded.

Potential Determinants

Potential determinants of nonadherence were identified from published literature reviews [23,24]. The questionnaire was developed from validated instruments, where available, and covered participants' demographic characteristics, use of medicines, self-rated health [25], and a battery of scales derived from economic [21] and sociocognitive [23,24] theories.

Affordability and cost-related behaviors were assessed by a dichotomous question asking whether respondents had to think about the money available to spend when obtaining their medicines and six related items, each measured on a five-point Likert scale [26]. Components of the European Social Survey [27] assessed household income: participants reported their main source of income, their total annual income (in bands), whether they were coping with their present income, and the ease or difficulty in borrowing money when in need. We assessed participants' time preference for near versus distant enjoyment of health benefits [28]. The internationally standardized European Task Force on Patient Evaluations of General Practice (EUROPEP) measure [29] assessed participants' evaluations of the health care they receive.

Validated, self-report tools were used to assess personal and sociocognitive determinants of nonadherence. Dispositional optimism was measured using the Life Orientation Test on five-point Likert scales [30]. Illness representations were measured using the Brief Illness Perception Questionnaire [31], which assessed personal beliefs about illness consequence, timeline, personal control, treatment control, illness identity, concern about illness, illness coherence, and emotional representations (the causal subscale was removed because of translation issues). The Beliefs about Medicines Questionnaire [32] assessed participants' belief in the necessity of their medicines and also concerns about their medicines. Components of the theory of planned behavior [33,34] measured attitudes/behaviors toward taking medicines, subjective norms of adherence, barriers to, and facilitators of, adherence, intention to adhere, and self-efficacy for adherence behaviors, each scored on a five-point Likert scale. The Building Research Initiative Group Illness Management and Adherence in Transplantation (BRIGHT) questionnaire [35,36] was used to assess constraints/facilitators of adherence using subscales for barriers and social support.

Outcome Measures

The primary outcome measure was self-reported nonadherence, based on the four-item Morisky Medication Adherence Scale [37]. This classified patients as being nonadherent according to a single "yes" response to any of the four questions that made specific reference to "high blood pressure medicine." This validated scale is the most frequently used questionnaire measuring adherence to medication [38]. An exploratory analysis was also conducted of those categorized as intentionally nonadherent on the basis of "yes" responses to two specific Morisky items that identify nonadherence as a result of feeling better/worse. A secondary outcome measure of adherence was provided by the Medication Adherence Rating Scale (MARS) [39], which consisted of five items rated on a Likert scale, with a low score (on a range of 5–25) indicating lower levels of adherence. Our choice of outcome measures was informed by the theoretical and empirical literature on medication adherence spanning the behavioral and medical sciences from which the study questions emerged. These two conceptually different measures provided dichotomous data on nonadherence and continuous data on adherence to patients' antihypertensive medications.

The final survey had a total of 135 items.

Translation

Measures that were not validated and available in the required language were translated into the appropriate languages using accredited translators who were native speakers of the target languages and fluent in English. Translations were checked for compatibility with the original version in a process of back translation, performed by persons who were native English speakers and fluent in each target language, to ensure that none of the original meaning was lost. For each language, a third individual acted as a reviewer and highlighted any discrepancies between the forward and back translations, which were resolved by discussion with the translators. All translations were