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Nonadherence to prophylactic medication

Negative attitudes toward doctors a strong predictor

Background

This study investigated factors that predict adherence to prophylactic medication. The design was data driven and aimed to expose the most prominent predictors of adherence.

Methods

A cross sectional sample of 24 males and 41 females, aged between 19 and 76 years, completed demographic questions, Medication Adherence Report Scale, Multidimensional Health Locus of Control Scale, Attitude towards Doctors and Medicine Scale, Eysenck Personality Questionnaire Revised (short scale) and the Short Form 36 Health Survey.

Results

Negative attitudes toward doctors, low mental health and chance health locus of control explained 33.2% of the variance in self reported medication nonadherence.

Discussion

That negative attitudes to doctors was a stronger predictor of nonadherence than side effects or medication cost was unexpected. Many studies have reported side effects and cost as primary reasons; however, these studies often do not assess the patient-doctor relationship.

Keywords

adherence; prophylactic medications; attitudes; health

Poor adherence to long term pharmacotherapy can be expected in approximately 50% of all patients, which may result in less treatment efficacy or overdose related side effects.[1,2] Poor adherence may delay improvement in patients' symptoms, patients may be more susceptible to relapse and risk of illness, and patients and their families may suffer unnecessarily.[3]

The present investigation focuses on adherence to prophylactic medicine: it is particularly germane, as patients with frequent or severe symptoms are more adherent than patients whose illnesses are asymptomatic, and many patients take prophylactic medications to prevent symptoms such as high cholesterol or high blood pressure.[4] Interestingly, a review of medication adherence literature reports that few articles assessed chronic treatment.[5]

Several studies reported the importance of beliefs about medicines in determining medication adherence. Lau and colleagues[6] identified six main factors that influenced adherence: belief in the importance of taking medications for osteoporosis, medication specific factors, beliefs regarding medications and health, relationships with healthcare providers, information exchange, and existing strategies to improve adherence.

A Cochrane review assessed patient focused interventions for enhancing medication adherence. Common recommendations included more instruction for patients, counselling, increasing treatment convenience, simplified dosing, increasing patient involvement in their care and special reminder pill packaging.[7] However, despite the diversity of interventions tested, less than half of the interventions tested were associated with statistically significant increases in medication adherence and less than one-third reported statistically significant improvements in treatment outcomes.[7] Van Dulmen[8] lamented the lack of studies that assessed the provider-patient encounter as there is evidence that well communicating providers can improve adherence substantially.[9,10] Practitioner communication may impact patient attitudes, but surprisingly, our review of the literature also revealed a dearth of literature exploring patient attitudes to practitioners and the effect this may have on adherence.

The purpose of the present investigation was to highlight specific predictors of adherence with the aim of identifying specific areas of intervention. Based on previous review articles[5,7] and commentary,[6,8] some of the main predictors of adherence (self reported health, side effects, locus of control) as well as attitudes towards doctors and medicines were assessed to determine which best explain self reported prophylactic medication adherence. Disposition was assessed to determine if stable individual traits were associated with adherence.

Methods

To be included in the study, participants were required to self report the use of prophylactic (preventive) medication for a chronic physical health problem. Questionnaires were completed anonymously after the medical consult at home and those interested went into a raffle draw to receive movie vouchers. Institutional ethics approval was received (FHEC 09/R10).

The package of questionnaires (which took approximately 15 minutes to complete) was provided to interested participants who saw the recruitment flyer at the clinic. It included:

• the Medication Adherence Report Scale

(MARS),[11] a nine-item scale that asks participants to rate the frequency of specific nonadherence to medication behaviours

- the Multidimensional Health Locus of Control scale (MHLC),[12] which uses three scales ('internal', 'chance' and 'powerful others') with six items each that assess how patients attribute their health status
- the Attitudes towards Doctors and Medicine Scale (ADMS), which uses 19 responses to assess four subscales: negative (NAD) and positive attitudes (PAD) toward doctors, and negative (NAM) and positive (PAM) attitudes toward medicines[13]
- the Eysenck Personality Questionnaire Revised (short scale) (EPQR-S)[14] (48 items), which assesses traits of extraversion (sociability, positive affect), neuroticism (over-responsive, over-reactive) and psychoticism (persons who are antisocial, tough minded and insensitive to others)
- the Short Form-36 Health Survey (SF-36),[15] which uses 36 items to assess 10 subscales: physical functioning, physical role limitations, bodily pain and general health perceptions (physical health); social functioning, general mental health, vitality and emotional role limitations (mental health).

Additional questions were designed to assess age, gender, condition for which prophylactic medication was prescribed, duration of this condition, the side effects from their medication, whether the participants thought that the medication was effective in managing their condition, or was overly expensive, and whether the participant found it difficult to pay for their medication.

Data analysis

One-way analysis of variance (ANOVA) was used to assess differences between groups within the sample. Using an approach conceptualised prior to data collection, the subscales of each questionnaire were entered as predictors of the MARS in separate backward regression analyses to determine which scales were most associated with adherence. After assessing the unique contributions of the predictor variables entered in these regression models, the significant predictors from the MHLC, ADMS, EPQR-S and SF-36 were entered in a final model that assessed their predictive relationship with the MARS scores.

Results

Participants (n=65: 24 male [37%]; 41 female [63%]) were recruited from general practice medical clinics from Victoria, Australia, between March and September 2009. Sixty-three participants reported their age, with a range of 19–76 years (mean=48.62 years, SD=15.10).

Twenty-six of the participants reported that they suffered side effects. Sixty-three participants thought that their medication was successful at managing their condition. Sixty-one participants reported that their medication was not expensive and they did not have difficulty paying for medication. Participants (n=62) reported that they had been taking their prophylactic medicine for an average of 8.22 years (SD=8.23). Descriptive statistics for the questionnaires are provided (*Table 1*).

To assess the relationship between age and adherence, the age data were divided into quartiles. These four groups were age 0–37 years (M=31.25, SD=7.54), 38–50 years (M=36.87, SD=6.49), 51–57 years (M=39.18, SD=5.88), and 58–77 years (M=40.65, SD=3.78).

A one-way ANOVA revealed differences between the age categories on the MARS scale, $F(3, 62)=5.89$, $p<.01$. Post hoc Tukey HSD tests revealed that the youngest group of participants (0–37 years) differed significantly from the two oldest groups (those aged between 51–57 and 58–77 years). The two groups of older participants were found to be more adherent, reflected by higher mean MARS scores, than the younger groups.

Seven one-way ANOVA tests were used to identify differences on the MARS scale based on gender, side effects, perceived management of the condition, if medication was expensive, difficulty paying for medication, duration of illness and type of medical condition (diabetes n=6, asthma n=12, high cholesterol n=5, high blood pressure n=13, arthritis n=4, other n=24). No significant differences were noted.

Primary analyses

The four ADMS subscales were selected as predictor variables within the regression analysis. Negative attitudes towards doctors

Table 1. Questionnaire means and standard deviations

Scale	Mean	Standard deviation
Medication Adherence Report Scale	36.91	7.65
Internal health locus of control	25.13	4.23
Chance health locus of control	19.58	5.69
Powerful others health locus of control	17.97	6.00
Positive attitudes toward doctors	12.42	4.07
Negative attitudes toward doctors	17.06	5.63
Positive attitudes toward medicine	14.42	3.27
Negative attitudes toward medicine	15.34	3.74
Psychoticism	3.02	0.34
Extraversion	7.24	4.15
Neuroticism	4.51	4.18
Physical functioning	75.60	24.50
Role limitations (physical)	66.79	39.02
Role limitations (emotional)	79.10	34.74
Vitality	56.34	20.68
General mental health	72.24	19.52
Social functioning	82.46	23.44
Pain	79.44	22.66
General health	60.67	17.56
Mental health	75.54	24.60
Physical health	70.63	25.94

entered as a predictor of MARS was the most significant, $R^2=0.27$, $F(1, 64)=23.30$, $p<.01$.

Next, the three subscales of the MHLC scale were assessed. The two 'external' dimensions of locus of control ('powerful others' and 'chance') were significant predictors of MARS, $R^2=0.26$, $F(2, 66)=9.48$, $p<.01$.

The three main subscales of the EPQR-S were entered as predictor variables. The only significant model emerged for psychoticism, $R^2=0.06$, $F(1, 66)=3.95$, $p=0.05$.

Finally, the 10 variables of the SF-36 were assessed. Social functioning and mental health were the most significant, $R^2=0.11$, $F(2, 64)=3.95$, $p<0.05$.

Negative attitudes toward doctors, mental health (a composite variable of four SF-36 subscales), powerful others health locus of control, chance health locus of control and psychoticism had the highest unique relationships with the MARS. Negative attitudes toward doctors, mental health and chance health locus of control $F(3, 64)=10.12$, $p<0.01$ explained 33.2% of the variance in the MARS scores.

Of the three predictive variables included in the regression analysis, the NAD variable made the greatest contribution to the model and had the largest effect on the MARS variable. Lower scores on the MARS, indicating lower levels of adherence, were predicted by negative attitude towards doctors ($\beta=-0.41$), lower levels of mental health ($\beta=0.17$), and a belief that the locus of control for health was chance ($\beta=-0.18$).

Discussion

The key finding of this study was that negative attitudes towards doctors appeared to be the most important variable in explaining nonadherence to prophylactic medication. Although previous adherence research has not explicitly investigated attitudes toward doctors, related research does support the current findings. Lau and colleagues[6] reported that an important factor in individuals' acceptance of medication was trust in their physicians' knowledge and expertise. Lin and Ciechanowski[16] reported that poor patient-doctor communication was a barrier to effective use of medicines for diabetes.

Contrary to previous findings, the present study found that side effects were not significantly associated with adherence. While some may wisely suggest that different medicines such as antipsychotics have more substantial side effects and that this may explain the findings, Lorish and colleagues[17] found that the most common intentional reason for nonadherence in a study of patients using prophylactics for arthritis was the experience of side effects. Similarly, Donovan and Blake[18] also reported that fear of side effects was the most frequent explanation given for why drugs or dosages were not taken as prescribed.

The current study found that 33.2% of the variance in adherence was explained by negative attitude towards doctors, mental health and chance health locus of control. Thus, the present study contributes useful findings both in the effect size attained and that the three variables that best predict adherence (negative attitudes towards doctors, mental health and chance health locus of control) are amenable to change (unlike side effects or disposition), which augers well for improved rates of medication adherence.

Interventions for improved mental health (eg. nutrition, exercise, medical and psychological support) and efforts to alter cognitive styles related to health locus of control (ie. to increase internal attributions) may be worthwhile. Additionally, it has been suggested that increasing doctors' friendliness and approachability, promoting cooperation between patients and doctors, and encouraging doctors to be more patient centred or empathetic may improve patient attitudes to doctors.[18] Gueguen and colleagues[19] reported that nonverbal techniques, including touching patients' forearms, were significantly associated with improved adherence.

The present study is limited due to its cross sectional design, suggesting it is unable to attribute causal pathways between variables and that the sample size may limit generalisability. The recruitment of patients via a medical clinic may also pose limitations, in that patients who have stopped taking a prophylactic medication totally (eg. due to side effects, beliefs about the importance of the medication or efficacy) may not be attending a clinic as regularly as other patients or even at all. These limitations, however, are balanced by several strengths, including that the design incorporated more variables than most studies and the effect sizes obtained in the regression analyses were very large.[20] It is difficult to gauge the accuracy of self reported adherence measures: though they are said to be superior to interview techniques, they are not as precise as electronic monitors.[21] Further, the present study identified that, in line with previous research,[22–25] the target demographic for intervention is younger adults. Prospective research is required to determine if adherence improves with age or if adherence is a product of generational factors.

Conclusion

Although there are now many prophylactic medications available, their full benefit will only be achieved if patients follow treatment regimens.[4] The current study found that lower levels of adherence were predicted, in rank order, by negative attitudes toward doctors, poor mental health and a belief that health is determined by chance. Patient focused intervention has been largely ineffective;[7] further empirical research is required to assess the efficacy of practitioner focused intervention in altering patient attitudes.

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