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Assessing the Impact of Autonomous Motivation and Psychological Need Satisfaction in Explaining Adherence to an Exercise Referral Scheme

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Abstract

Given the mixed findings concerning self-determination theory in explaining adherence to exercise referral schemes (ERS), the present study attempted to examine whether autonomous motivation and psychological need satisfaction could predict ERS adherence. Participants referred to an 8-week ERS completed self-report measures grounded in self-determination theory and basic needs theory at baseline (N=124), mid-scheme (N=58), and at the end of the scheme (N=40). Logistic regressions were used to analyse the data. Autonomous motivation measured at mid-scheme explained between 12% and 16% of the variance in ERS adherence. Autonomy, relatedness and competence measured at mid-scheme explained between 18% and 26% of the variance in ERS adherence. This model also explained between 18% and 25% when measured at the end of the scheme. The study found limited evidence for the role of autonomous motivation in explaining ERS adherence. Stronger support was found for the satisfaction of the three needs for autonomy, relatedness and competence in predicting ERS adherence. Future research should tap into the satisfaction of all three needs collectively to help foster ERS adherence.

Keywords: exercise referral scheme; adherence; self-determination theory; psychological need satisfaction.

Introduction

Exercise referral schemes (ERS), programmes of structured exercise provided at a discounted rate to 'at-risk' individuals, have been utilized to help offset physical inactivity and health problems in the UK. However, reviews (e.g., Campbell et al., 2015; Pavey et al., 2011) have reported the schemes to be no more effective than usual care. Pavey and colleagues identified the importance of theory in furthering our understanding of the effectiveness of ERS as causal relationships can be uncovered, providing implications for interventions (Michie et al., 2007). Such theory-based research in ERS may provide insight into the adoption and maintenance of physical activity (Baranowski & Jago, 2005).

Self-determination theory (SDT; Deci & Ryan, 1985) and its sub-theory, basic needs theory (BNT; Ryan & Deci, 2000), have the potential to provide such understanding. SDT makes the distinction between autonomous motivation (e.g., interest and/or enjoyment in the activity) and controlled motivation (e.g., guilt and/ or external reinforcement). BNT posits that three psychological needs for autonomy (the need to have choice), relatedness (the need to feel accepted by peers) and competence (the need to feel effective in performing a task) are required to promote effective functioning.

It is generally considered that autonomous motivation contributes to exercise maintenance (Hagger et al., 2014), and that the satisfaction of the three needs results in positive behavioural and psychological outcomes in exercise (Podlog & Dionigi, 2009). However, in ERS settings, findings are less clear. Support has been found for adherers to ERSs exhibiting higher levels of autonomous motivation than non-adherers (e.g., Morton, Biddle, & Beauchamp, 2008; Rahman, Thogersen-Ntoumani, Thatcher, & Doust, 2011), however, Edmunds, Ntoumanis, and Duda (2007) observed no such differences. Components of BNT have been shown to contribute to adherence to an ERS, with relatedness highlighted as being most influential (Edmunds et al.; Rahman et al.), though Markland and Tobin (2010)

found only autonomy need satisfaction to contribute to positive behavioural outcomes. Given the ambiguity concerning the specific impact of SDT and BNT in promoting ERS adherence, further research is required to establish the importance of these factors.

Differences between adherers and non-adherers, and changes in these psychosocial constructs throughout an ERS have been assessed, however, it is beneficial to examine how adherence is explained by such factors measured at baseline, mid-point and at the end of an ERS to illustrate the importance of these components at disparate time periods. This would give an indication as to the key time frame for SDT and BNT variables to be of importance for contributing to ERS adherence.

The aims of the present study are to: (i) predict ERS adherence from autonomous motivation measured at baseline, mid-scheme, and end-scheme; and (ii) to predict ERS adherence from BNT variables measured at each stage of the scheme.

Methods

Participants

Adults (N=124; 75 females) aged 20-70 years old (M_{age}=48.00, SD=11.69) were recruited opportunistically from within an existing ERS. Participants were referred for a range of physiological and psychological reasons (e.g., anxiety, hypertension) and provided informed consent.

Procedure

Institutional ethical approval was obtained. Persons referred to the 8-week free of charge ERS located across a Scottish borough were sent a questionnaire pack, covering letter, information sheet and a pre-paid return envelope, prior to their initial exercise induction. Participants were asked to return the questionnaire pack by no later than the day of their initial induction.

Calls were made to participants to return their pack 48-hours post-induction. Packs received beyond 7-days post-induction were excluded from the study. A total of 361 questionnaire packs were sent out with 133 completed packs returned (nine packs were received after the 7-day deadline so were excluded). Follow-up questionnaire packs consisting of the same measures as at baseline were sent to participants at 4-weeks and at 8-weeks, representing mid-scheme and end-scheme assessment points. Calls were again used following the same protocol as at baseline.

Measures

Adherence

Electronic attendance data was utilized to measure participants' adherence to the ERS via a card swiping system. Adherence to the ERS was classified as attendance to ≥16-sessions over the 8-week exercise referral period. This criterion was based on discussions with the ERS provider as well as conformity to the reviewed literature utilizing a substantiated definition of adherence to an ERS (Jones, Harris, Waller, & Coggins, 2005).

SDT

The 19-item Behavioural Regulation in Exercise Questionnaire (Markland & Tobin, 2004) measured participants' motivation to engage in exercise, providing five subscales: amotivation, external regulation, introjected regulation, identified regulation, and intrinsic regulation. An integrated regulation subscale was also included (Li, 1999). Participants responded on a scale ranging from zero=not true for me to four=very true for me. Internal consistency scores for all measures are outlined in Table 1.

BNT

The 18-item Psychological Need Satisfaction in Exercise Scale (Wilson, Rogers, Rodgers, & Wild, 2006) measured participants' exercise-related need satisfaction, with three subscales provided: autonomy, competence, and relatedness. Participants responded on a scale ranging from one=false to six=true.

Data analysis

Data were analyzed using SPSS (version-22). Logistic regressions were conducted to distinguish between adherence (attendance to ≥16 sessions over the 8-week ERS) and non-adherence (attendance to ≤15 sessions) from the variables measured at baseline, mid-scheme, and end-scheme. Separate models were computed to assess the standalone impact of SDT and BNT at each time point respectively. Statistical significance was set at $p<0.05$.

Results

[Insert table 1 near here]

Adherence to the ERS

Of the 124 participants that completed self-report measures at the start of the ERS, 29 participants (23% of the sample) were classified as adherers having attended ≥16 sessions over the 8-week ERS. At mid-scheme, 58 participants returned questionnaire packs, with 19 participants (33%) classified as adherers. At end-scheme, 40 participants returned questionnaire packs, with 13 participants (32%) classed as adherers.

Explaining adherence from autonomous motivation

Baseline

An intrinsic regulation and integrated regulation logistic regression model did not significantly explain ERS adherence, $\chi^2(2, N=124) = 1.91$, p=.385.

Mid-scheme

Logistic regression model significantly distinguished between adherers and non-adherers to the ERS, $\chi^2(2, N=58) = 7.05$, p=.029, accounting for 12% (Cox and Snell R square) to 16% (Nagelkerke R squared) of the variance (see table 2).

[Insert table 2 near here]

End-scheme

Logistic regression model did not significantly explain ERS adherence, $\chi^2(2, N=40) = 4.22$, p=.122.

Explaining adherence from psychological need satisfaction

Baseline

An autonomy, relatedness, and competence logistic regression model did not significantly explain ERS adherence, $\chi^2(3, N=124) = 2.64$, p=.450.

Mid-scheme

Logistic regression model significantly distinguished between adherers and non-adherers to the ERS, $\chi^2(3, N=58) = 11.71$, p=.008, accounting for 18% to 26% of the variance (see table 3).

[Insert table 3 near here]

End-scheme

Logistic regression model significantly distinguished between adherers and non-adherers to the ERS, $\chi^2(3, N=40) = 7.94$, p=.047, accounting for 18% to 25% of the variance (see table 4).

[Insert table 4 near here]

Discussion

The present study examined adherence to an ERS from variables grounded in SDT and BNT. Key findings showed that autonomous motivation explained only a small proportion of the variance in ERS adherence; and the satisfaction of autonomy, relatedness and competence provided a stronger explanation of adherence from both mid-scheme and end-scheme assessment. The findings play down the usefulness of SDT in ERS settings and provide support for the influence of BNT.

Autonomous motivation measured at mid-scheme explained 12% to 16% of the variance in ERS adherence. Whilst this provides a stronger explanation of ERS adherence compared with previous studies (Edmunds et al., 2007; Rahman et al., 2011), a substantial amount of variance remains unaccounted for, which suggests autonomous motivation may not be important for ERS adherence. Such findings may be due to the implicit processes that cannot be captured by SDT. Indeed, Keatley, Clarke, and Hagger (2012) summarized that theoretical models adopted in health settings may not account for the more impulsive processes that may lead to action.

Psychological need satisfaction measured at mid-scheme explained 18% to 26% of the variance in ERS adherence, with a similar amount of variance explained from end-scheme assessment. This is in line with previous studies investigating BNT in ERS settings (e.g., Edmunds et al., 2007; Markland & Tobin, 2010; Rahman et al., 2011). However, there were

no independent predictors of ERS adherence, thus it could be argued that BNT variables used in combination may be important for ERS adherence rather than in isolation.

Limitations of the present study include that electronic attendance data was utilized as an objective assessment ERS adherence, which overlooks the intensity of participants' exercise sessions. It would have been useful to also assess exercise intensity to draw inferences on this aspect of activity. Second, total attendance may not distinguish between someone who attended twice a week consistently for 8-weeks and someone who attended 16 sessions but dropped out after 4-weeks. Thus, tracking weekly as well as total activity should be a priority for future research.

The present study examined the usefulness of SDT and BNT in predicting ERS adherence. We found limited evidence for the role of autonomous motivation in contributing to ERS adherence whilst the satisfaction of autonomy, relatedness, and competence was found to explain around a quarter of the variance in adherence. Future research and intervention strategies should focus on the satisfaction of all three needs to help foster ERS adherence with less attention being paid to autonomous motivation.

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Table 1. Reliability (Cronbach's α) and descriptive statistics for examined variables across the whole sample at baseline, mid-scheme and end-scheme.

	Range	Baseline		Mid-scheme		End-scheme	
		α	M (SD)	α	M (SD)	α	M (SD)
N			124		58		40
Intrinsic motivation	0-4	.92	2.13 (1.16)	.95	2.12 (1.18)	.92	2.11 (1.05)
Integrated regulation	0-4	.93	1.30 (1.26)	.92	1.41 (1.19)	.94	1.39 (1.20)
Identified regulation	0-4	.79	2.24 (1.01)	.79	2.31 (1.02)	.85	2.20 (1.01)
Introjected regulation	0-4	.81	1.38 (1.23)	.83	1.43 (1.16)	.80	1.13 (1.04)
External regulation	0-4	.86	0.78 (1.04)	.87	0.63 (0.99)	.87	0.50 (0.85)
Amotivation	0-4	.78	0.40 (0.63)	.80	0.44 (0.76)	.81	0.41 (0.73)
Autonomy	1-7	.93	4.23 (1.28)	.95	4.69 (1.16)	.97	4.61 (1.39)
Relatedness	1-7	.95	2.90 (1.52)	.93	3.10 (1.44)	.97	3.10 (1.61)
Competence	1-7	.95	3.24 (1.26)	.95	3.28 (1.20)	.96	3.43 (1.25)

Table 2. Logistic regression predicting adherence to the ERS from self-determined motivation measured at mid-scheme

			95% CI for Odds Ratio		
	B (SE)	p	Lower	Odds Ratio	Upper
Intrinsic motivation	.17 (.31)	.590	.64	1.18	2.19
Integrated regulation	.55 (.31)	.071	.95	1.73	3.15
Constant	-1.95 (.70)	.005		.143	

Table 3. Logistic regression predicting adherence to the ERS from BNT variables measured at mid-scheme

			95% CI for Odds Ratio		
	B (SE)	p	Lower	Odds Ratio	Upper
Autonomy	.14 (.31)	.662	.62	1.15	2.10
Relatedness	.29 (.24)	.214	.84	1.34	2.14
Competence	.65 (.34)	.054	.99	1.92	3.72
Constant	-4.56 (1.61)	.005		.010	

Table 4. Logistic regression predicting adherence to the ERS from BNT variables measured at the end of the scheme

			95% CI for Odds Ratio		
	B (SE)	p	Lower	Odds Ratio	Upper
Autonomy	.53 (.40)	.182	.78	1.70	3.73
Relatedness	.27 (.25)	.276	.80	1.32	2.15
Competence	.32 (.40)	.421	.63	1.37	2.98
Constant	-5.39 (2.24)	.015		.005	