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Identifying and describing feelings and psychological flexibility predict mental health in men with HIV

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Background. Difficulty identifying and describing feelings (DIDF) and psychological flexibility (PF) predict poor emotional adjustment.

Objective. To examine the relationship between DIDF and PF and whether DIDF and low PF would put men undergoing cancer screening at risk for poor adjustment.

Design. Longitudinal self-report survey.

Methods. Two hundred and one HIV-infected men who have sex with men participated in anal cancer screening at two time points over 14 weeks. Psychological flexibility was assessed by the Acceptance and Action Questionnaire II and DIDF by the Toronto Alexithymia Scale-20. We also measured depression, anxiety, stress (DASS) and health-related quality of life (QOL; SF-12).

Results. Both DIDF and PF were reliable predictors of mental health. When levels of baseline mental health were controlled, greater DIDF predicted increases in Time 2 depression, anxiety and stress and decreases in mental and physical QOL. The link between PF and mental health was entirely mediated by DIDF.

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Conclusions. Being chronically low in PF could lead to greater DIDF and thereby worse mental health. Having more PF promotes the ability to identify and differentiate the nuances of pleasant and unpleasant emotions, which enhances an individual's mental health. Intentionally enhancing men's ability to identify and describe feelings or PF may assist them to better manage a range of difficult life experiences such as health screenings and other potentially threatening information.

Statement of contribution

What is already known on this subject? Difficulties identifying and describing feelings (DIDF); components of alexithymia and psychological flexibility (PF) both predict emotional adjustment. A cross-sectional study has identified that alexithymia and PF are related concepts. Cancer screening programmes can have difficult psychological impacts.

What does this study add? The longitudinal design supported cross-sectional findings that DIDF and PF are related concepts. The link between PF and mental health was mediated by DIDF. Enhancing DIDF or PF may assist psychological responses to health screening.

Early detection screening programmes have been well established for a variety of cancer types. More recently, anal cytological screening for anal cancer has been recommended (New York State Department of Public Health AIDS Institute, 2007). Population rates of anal cancer are 1.6 per 100,000 (Darragh & Winkler, 2011). However, men who have sex with men (MSM) and are HIV infected have considerably higher rates, estimated at between 42 and 137 per 100,000 (Darragh & Winkler, 2011). The psychological impact of cancer screening has been demonstrated in many different programmes and typically includes increased anxiety, reduced quality of life (QOL) and increased health vigilance (Brett, Bankhead, Henderson, Watson, & Austoker, 2005; Gray *et al.*, 2006; McNaughton-Collins *et al.*, 2004). Strategies for reducing these effects involve clear communication in written and verbal forms about the procedures and results (Wilkinson, Jones, & McBride, 1990; Wilson & Hines, 2000). Another way to reduce the negative effects of screening may be to develop an individual's strengths (e.g., ability to identify and describe feelings and psychological flexibility [PF]) to enhance their coping ability. There are numerous theories that have the potential to explain how an individual copes with health threat. Our study focuses on the two individual characteristics: the difficulty in identifying and describing feelings (DIDF; Bagby, Parker, & Taylor, 1994) and PF. Difficulties in identifying and describing feelings are major components of alexithymia (Bagby *et al.*, 1994). Psychological flexibility is 'the ability to contact the present moment more fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends' (Hayes, Luoma, Bond, Masuda, & Lillis, 2006). Both DIDF and PF have been shown to explain differences in psychological functioning (Berrocal, Pennato, & Bernini, 2009; Gloster, Klotsche, Chaker, Hummel, & Hoyer, 2011), physical well-being (McCracken & Zhao-O'Brien, 2010; Saharinen *et al.*, 2008) and QOL outcomes (Hayes *et al.*, 2006; Modestin, Furrer, & Malti, 2004).

Identifying and describing feelings

As noted, the ability to identify and describe feelings is a major component of alexithymia. Alexithymia is characterized by difficulty in naming or expressing feelings, difficulty

distinguishing between bodily sensations and feelings, and a preoccupation with external events. Individuals with alexithymia have deficits in identifying and communicating their feelings and show little insight into feelings, symptoms and motivation (Lumley, Neely, & Burger, 2007). DIDF as measured by alexithymia subscales leads to better psychological and psychosocial functioning in medical patients (Picardi *et al.*, 2007) and the general population (Berrocal *et al.*, 2009). Quality of life in the general population is higher when alexithymia scores are lower (Modestin *et al.*, 2004; Saharinen *et al.*, 2008); conversely, a 5-year prospective study in Finland found that alexithymia was associated with increased mortality rates in men (Kauhanen, Kaplan, Cohen, Julkunen, & Salonen, 1996). Thus, the ability to recognize and describe emotions is likely to have benefits for coping with health problems. Men tend to be poorer at identifying and describing emotions than women (Mattila *et al.*, 2008) and so this may be of particular importance in the male population. Alexithymia has been associated with increased symptoms and illness behaviours in patients with HIV (Lumley, Tomakowsky, & Torosian, 1997) and those with fibromyalgia (van Middendorp *et al.*, 2008). van Middendorp *et al.* (2008) concluded, 'affect intensity was related to more severe pain only in combination with the inability to process or verbalize emotions, suggesting that the intense experiencing of emotions is not necessarily maladaptive as long as these emotions are adequately processed' (p.165). The ability to identify and describe one's feelings is helpful in coping with difficult situations; this is illustrated by studies of alcohol consumption and treatment. In an experience sampling study of underage drinking, Kashdan, Ferssizidis, Collins, and Muraven (2010) found that the number of drinks per session was related to the ability to differentiate between emotions. Moreover, in the presence of high negative emotion intensity, those with better skills at differentiating emotions had fewer drinks than those who were less able to differentiate (Kashdan *et al.*, 2010). Better alcohol treatment outcomes have also been found to be significantly related to lower alexithymia scores (Cleland, Magura, Foote, Rosenblum, & Kosanke, 2005). These studies illustrate that it is not the situation or particular emotion that is important, but the individual's ability to process them. This skill is likely to be helpful in coping with the waiting and uncertainty of cancer screening.

Psychological flexibility

Psychological flexibility, the ability to be in the present moment and to behave in ways that are adaptable and will achieve a person's values, has been shown to improve many aspects of well-being. In a meta-analysis of 32 studies, higher PF was consistently associated with better QOL and other psychological outcomes (Hayes *et al.*, 2006). In more recent reviews, it was concluded that acceptance and commitment therapy (ACT) interventions which focus on enhancing PF were showing preliminary research evidence for effectiveness (Pull, 2009) and that effect sizes were large and typically better at follow-up than at the end of therapy (Ruiz, 2010). Cheng (2003) and Cheng and Cheung (2005) found that individuals who had higher PF in their coping efforts were better adjusted, had less anxiety and depressive symptoms. Psychological flexibility differentiated between help-seeking groups and the general population. Furthermore, PF elucidated the aspects of functioning and mental health beyond well-validated measures of mental health (Gloster *et al.*, 2011). It is theorized that, 'When people lack psychological acceptance (PF) they are more vulnerable to emotional difficulties' (McCracken & Zhao-O'Brien, 2010). This is confirmed by studies showing that PF mediates outcomes associated with ACT interventions including mental health and well-being (Bond & Bunce, 2003; Donaldson-Feilder, & Bond, 2004); pain (McCracken & Zhao-O'Brien, 2010; Wicksell, Renöfält, Olsson, Bond, & Melin, 2008); social

phobia (Dalrymple & Herbert, 2007); generalized anxiety (Roemer, Orsillo, & Salters-Pedneault, 2008); and depression (Forman, Herbert, Moitra, Yeomans, & Geller, 2007). Increasing PF enabled better QOL and greater engagement in life.

Karekla and Panayiotou (2011) found that individuals with low PF used avoidant coping methods to a greater extent, such as denial, emotional support, behavioural disengagement, venting and self-blame. It has been proposed that a lack of PF may be the mechanism by which avoidant coping is detrimental and it has been found that when levels of PF are controlled, avoidant coping and fear of uncertainty no longer predict psychological outcomes (Berrocal *et al.*, 2009). In cancer screening, use of acceptance-based coping strategies (high PF) after receiving abnormal cervical Pap smear results was associated with lower psychological distress (Lauver, Kruse, & Baggot, 1999). Conversely, use of escape-avoidance coping (low PF) after receiving an abnormal colorectal cancer screening result was associated with more distressing emotional representations of the illness, increased anxiety and identification of bowel symptoms and non-participation in screening 2 years later (Orbell *et al.*, 2008). These studies show a clear link between avoidance (low PF) and worse well-being.

Psychological flexibility involves being willing to experience unpleasant emotions without needing to change them. If an individual is low in PF, this means they are more likely to avoid, distract or ignore negative emotions. Such a tendency to avoid may limit their opportunities for identifying and clearly labelling emotions. However, it is not clear from previous research whether it is that learning to be aware of and describe emotions allows one to be more flexible, which in turn improves functioning, or whether it is that learning to be flexible with one's private experiences facilitates improved identification and description of emotions, which, in turn, improves functioning? In a cross-sectional study, Berrocal *et al.* (2009) investigated the relationship between PF and alexithymia in predicting psychological outcomes. Even when the level of PF was controlled, alexithymia and PF independently predicted psychological outcomes. They concluded that alexithymia and PF were related, but independent, psychological characteristics.

Aims

Berrocal *et al.*'s (2009) study was cross-sectional and used a student and convenience sample of the general population. They suggest the need for further research to expand understanding of alexithymia and PF. Our study provides an extension, using longitudinal data from a medical setting. This design allows assessment of the extent that DIDF and PF are antecedent to the development of mental health, rather than a mere concomitant or consequence. Furthermore, it allows us to examine mediation between these characteristics. We focused on men with HIV, who were being investigated for anal cancer precursors. The potential for uncertainty and distress is well documented by studies of other cancer screening programmes.

We tested three models of the link between DIDF/PF, screening and mental health. What we call the *situation effect model* predicts that medical results, rather than DIDF/PF, will determine mental health after screening. The *interaction model* predicts that the effect of the medical results will depend on how much DIDF/PF the participant displays. The *resilience model* predicts that DIDF/PF determines the development of positive mental health, regardless of medical results. We also compare models that presume DIDF is the mediator between PF and mental health with models that assume PF is the mediator between DIDF and mental health.

Methods

Participants

A prospective longitudinal study of 291 MSM infected with HIV undergoing anal cytological screening in Sydney, Australia, was conducted from October 2008 to April 2010. The study was approved by the Human Research Ethics Committee of the hospital, and written informed consent was obtained from all participants. Any MSM who were HIV infected and attended the HIV clinic during the study period were eligible. Exclusion criteria included a significant bleeding disorder, anal pathology likely to render an anal swab significantly uncomfortable and being unable or unwilling to give informed consent.

Measures

Proposed mediators

Difficulty identifying and describing feelings was measured by subscales of the Toronto Alexithymia Scale-20 (TAS-20; Bagby *et al.*, 1994). The scale included items such as 'When I am upset, I don't know if I am sad, frightened, or angry' and 'It is difficult for me to find the right words for my feelings'. Higher scores indicate less ability to identify emotions. For the purpose of the present study, one scale was formed by combining the 12 items rating DIDF. There was a high correlation between these two scales (r = .68). Cronbach's alpha for the 12-item DIDF scale was α = .88.

Psychological flexibility was measured using the Acceptance and Action Questionnaire II (AAQ-II; Bond *et al.*, 2011). The AAQ-II measures the tendency to control thoughts and feelings and ability to act in the presence of difficult thoughts or feelings. It is the most well-established measure of PF, measuring the totality of the above processes (Gloster *et al.*, 2011; Luoma, Drake, Kohlenberg, & Hayes, 2011). Each item is rated on a 7-point Likert scale (e.g., 'I worry about not being able to control my worries and feelings' and 'My painful memories prevent me from having a fulfilling life'). Higher scores indicate higher PF. The AAQ-II has been shown to have adequate test–retest reliability, discriminant, convergent and predictive validity (Bond *et al.*, 2011; Gloster *et al.*, 2011). In the present study, Cronbach's alpha for the scale was α = .91.

Mental health outcome variables

The Medical Outcomes Study Short Form Health Survey (SF-12) is a widely used measure of health-related QOL that is well validated in Australia (Andrews, 2002; Sanderson & Andrews, 2002). Two summary scales of physical (PCS) and mental (MCS) well-being are generated using the brief integer scoring method developed by Andrews (2002).

The Depression Anxiety Stress Scale (DASS 21; Lovibond & Lovibond, 1995) measures depression, anxiety and stress. Items such as 'I felt scared without any good reason' are rated on a 4-point Likert scale. The measure has been used with general, clinical and HIV-infected populations and has good internal consistency, validity and test–retest reliability (Henry & Crawford, 2005; Lovibond & Lovibond, 1995). In the present study, Cronbach's alpha for the depression scale was α = .94, anxiety scale α = .88 and stress scale α = .92.

Procedures

The medical aspects of the screening study began with a sexual health research nurse conducting a detailed history of sexual and anal health and giving instructions regarding the self-collection of swabs for anal cytology and anal bacterial sexually transmitted infections. The cytology results were delivered by phone or mail 2 weeks later. Further investigation by high-resolution anoscopy (HRA) was offered to participants whose cytology results were high-grade squamous intraepithelial lesion (HSIL), atypical squamous cells – cannot exclude HSIL (ASC-H), or atypical squamous cells – unknown significance (ASC-US). The HRA procedure is similar to colposcopy investigation of cervical smear abnormalities. The wait for this procedure was 8–10 weeks. Approximately 2 weeks following the HRA procedure, histology results were given in person or by mail and follow-up options discussed.

The psychological impact assessments occurred at the three stages of the medical process outlined above. Data were collected at baseline with questionnaire pack one given at the initial interview, to be completed that day and mailed back. The second and third questionnaire packs were mailed in the week following the date the participant received their cytology and histology results, approximately 2 and 12–14 weeks after baseline. Participants not offered an HRA were sent the third questionnaire pack at a time-matched interval of 12 weeks after baseline. The questionnaire packs took 20–30 min to complete.

Statistical analyses

Data from baseline and the third questionnaire, given after histology results or the time-matched interval, were used in this analysis and are referred to as Time 1 and Time 2. We did not use questionnaire pack two as this was collected for the medical aspect, the time frame was only a week, and for this research question, we were interested in examining change over a longer time period. All analyses were completed using SPSS version 17 for Windows (SPSS Inc, Chicago, IL, USA) and Amos version 6 (Amos Development Corporation, Chicago, IL, USA). As the pattern of results was similar for all mental health outcome variables, we have not reported mental QOL in order to streamline the tables.

Results

Two hundred and ninety-one men were approached and 271 (93%) agreed to participate in the psychological impact study. Sixty-nine per cent (187/271) completed both Time 1 and Time 2; the data from full 'Completers' were used in the demographics and descriptive analysis. Seventy-one (26%) completed only baseline, but not follow-up assessments, and 13 (5%) dropped out of the medical study. In order to use all available data to test the models, we utilized expected likelihood imputation to replace missing values. This method tends to produce unbiased estimates (Howell, 2008).

Descriptive statistics

Missing value analysis revealed two significant differences between those who completed every wave of the study ('Completers') and those who did not complete every wave ('Non-completers'). There was a significant age difference between Completers (M = 51 years, SD = 9) and Non-completers (M = 48 years, SD = 10), $F(1,289) = 9.34$, $p = .002$. The Completers also scored higher on the AAQ-II (M = 42.88, SD = 11.35) than Non-

completers (M = 39.07, SD = 12.45), $F(1,268) = 6.11$, $p = .014$, showing they were slightly more psychologically flexible.

Completers had a mean age of 51 years (SD = 9, range = 28–73 years), half (49%) were in an ongoing relationship, and of those, 76% had been in that relationship for longer than 5 years. Tertiary education was finished by 64% and 51% were in full-time employment. Nine per cent were taking antidepressant medication, 29% were current smokers, 85% were current alcohol drinkers, and 49% had used illicit drugs in the last 2 years. Fifteen years was the average time since diagnosis of HIV infection (SD = 8, range = 1–28), and 91% were taking HIV medications, with an average of 10 years on medications (SD = 6, range = 1–22). Mean mental health scores are shown in Table 1; these were calculated on the sum scores for the DASS and SF-12.

According to the study protocol, the cytology (swab) results indicated that 67% were told after Time 1 that they did not require further investigation by HRA (Low Threat Group; LTG n = 126). The remaining 33% were recommended to have an HRA. At HRA, 43% either did not need a biopsy or histological results indicated wart virus or low-grade anal intraepithelial neoplasia. These participants form the Reassured Group (RG, n = 26), because their cytology results indicated the need for further assessment, but the second, more detailed assessment indicated low risk for cancer. The remaining 57% had high-grade anal intraepithelial neoplasia histology results, that is, the precursor to anal cancer, and thus form the High Threat Group (HTG, n = 35).

Main analysis

To test the situation effect model, one-way ANOVAs and analysis of mental health scores were used to investigate the differences between the medical result groups: low threat, reassured and high threat. There were no significant differences at Time 1 or 2 between the groups for ratings of depression, anxiety, stress and physical, ps > .05. For example, depression Time 1 LTG M = 0.51, SD = 0.63, RG M = 0.56, SD = 0.77, HTG M = 0.55, SD = 0.73.

Table 1. Means and correlations of outcome measures with proposed mediators at Time 1 and Time 2

			Correlations		Partial correlations controlling for Time 1	
Measure and time	*M*	*SD*	DIDF	PF	DIDF	PF
Depression						
Time 1	3.24	4.34	.54**	−.64**		
Time 2	3.55	4.64	.58**	−.55**	.32**	−.13*
Anxiety						
Time 1	2.13	3.36	.51**	−.55**		
Time 2	2.59	3.80	.49**	−.43**	.27**	−.07
Stress						
Time 1	4.37	4.28	.52**	−.59**		
Time 2	4.54	4.53	.57**	−.54**	.35**	−.19*
Physical QOL						
Time 1	49.60	9.66	−.30**	.22*		
Time 2	48.95	9.70	−.35**	.25**	−.23**	.12*

Note. Paired *t*-tests showed no significant effects over time. *$p < .05$; **$p < .001$; N = 187. DIDF, difficulty identifying and describing feelings; PF, psychological flexibility; QOL, quality of life.

The interaction effect model was tested using repeated-measure ANCOVAs with Time (×2) as the repeated measure, group (LTG, RG, HTG) as the between-subject measure, PF or DIDF as the covariate and the interactions involving the covariate. The results showed that neither group nor the interaction between group and PF or DIDF predicted levels of mental health at Time 2, $p > .05$. Thus, the situational and interaction effect models were not supported. *Post-hoc* power analysis revealed we only had 0.3 or less power to detect a small difference.

The resilience model was tested using multiple regression to evaluate the effect of baseline levels of PF and DIDF on mental health. Prior to conducting these regression analyses, we completed a series of correlations and partial correlations to characterize the relationships between the mental health and proposed mediator variables, shown in Table 1. All correlations were significant at $p < .05$ and ranged from $r = -.64$ to $r = .67$. The partial correlations controlling for Time 1 level of mental health were all significant for DIDF and except for anxiety were also significant for PF at $p < .05$. The correlation between DIDF and PF was $r = -.69$, $p < .001$. The correlations between the mental health outcome variables are shown in Table 2; these were all significant at $p < .005$.

Hierarchical multiple regression examined the resilience model, the ability of PF and DIDF at Time 1 to predict mental health at Time 2 when controlling for Time 1 mental health. In each equation, mental health at Time 1 was entered first with PF and DIDF entered simultaneously in the next step. The results are shown in Table 3. Each of the five regressions was consistent. As expected, Time 1 mental health levels significantly predicted Time 2 mental health, accounting for 20–41% of the variance. This left smaller increments of residual change to be explained by other variables. Nevertheless, DIDF significantly predicted variance in depression 7%, anxiety 6%, stress 10%, mental QOL 3% and physical QOL 3%. Relative to those high in DIDF with a particular baseline in mental health, those low in DIDF with the same baseline were less depressed, anxious, stressed and had higher mental and physical QOL at Time 2. Psychological flexibility did not explain any unique variance over and above DIDF. We assessed the following demographic and potential confound variables: age, alcohol usage, average time since diagnosis of HIV infection, level of education and current immune system level. None of these variables were significantly related to our mental health variables, ps $> .4$, and covarying for them did not alter any of our longitudinal findings.

Mediation analysis then compared the two mediation models. Model 1 assumed that DIDF was the mediator and Model 2 assumed that PF was the mediator (Figure 1). Four tests were run in each model with the different dependent variables (depression, anxiety, stress, physical QOL). We used a non-parametric bootstrapping approach to estimate the indirect, meditational effects. This method is appropriate with smaller samples and does not assume normal distribution as outlined in Gaudiano, Herbert, and Hayes (2010). From the original data set, 5,000 identically sized data sets were created by randomly drawing participants and replacing each value as it was sampled. The bias-corrected 95%

Table 2. Correlations between the mental health outcome variables at Time 1

	Depression	Anxiety	Stress
Anxiety	.66**		
Stress	.71**	.75**	
Physical QOL	−.31**	−.27**	−.17**

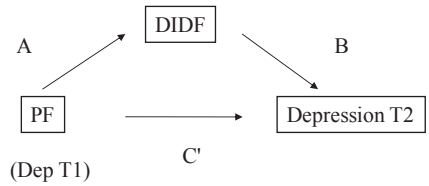
Note. **$p < .005$. QOL, quality of life.

Table 3. Results of multiple regression analysis predicting mental health at Time 2 (T2) from DIDF, psychological flexibility (PF) and mental health at Time 1 (T1)

Step and variable	R^2	ΔR^2	β
Depression T2			
1. Depression T1	.34	.34	.61***
2. DIDF	.44	.07	.34***
2. PF			−.07
Anxiety T2			
1. Anxiety T1	.25	.25	.50***
2. DIDF	.32	.06	.36***
2. PF			−.15
Stress T2			
1. Stress T1	.20	.20	.44***
2. DIDF	.29	.10	.38***
2. PF			−.04
Physical QOL T2			
1. Physical QOL T1	.41	.41	.64***
2. DIDF	.45	.03	−.22**
2. PF			.06

Note. *$p < .01$; **$p < .005$; ***$p < .001$; $N = 176$. DIDF, difficulty identifying and describing feelings; QOL, quality of life.

Model 1: Does DIDF mediate the effect of PF on Depression?



Model 2: Does PF mediate the effect of DIDF on Depression?

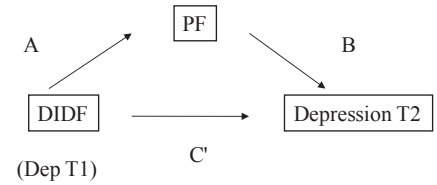


Figure 1. Mediation models. PF, psychological flexibility; DIDF, difficulty identifying and describing feelings; A, direct effect; B, direct effect; C′, direct effect; Dep T1, controlling for Time 1 level of depression; NB: For mediation to occur: B, significant (shown in Table 3), C′, non-significant (shown in Table 3); A × B (indirect effect), significant (shown in Table 4).

confidence intervals (CI) were then examined. Mediation was declared to be significant if the CI did not contain 0.

The mediation results shown in Table 4 give clear evidence that PF is being mediated by DIDF. That is, there were reliable indirect effects between PF and mental health via

Table 4. Mediation analysis with bootstrapped point estimates and bias-corrected confidence intervals for indirect effects of psychological flexibility (PF) and DIDF on Time 2 mental health, using Time 1 mental health outcomes as a covariate

	Model 1			Model 2		
	PF → DIDF			DIDF → PF		
	Indirect effect[a]	BC 95% CI		Indirect effect[b]	BC 95% CI	
Variable	Point Estimate Mean	Lower	Upper	Point Estimate Mean	Lower	Upper
Depression	0.249*	0.144	0.354	−0.052	−0.138	0.044
Anxiety	0.263*	0.150	0.397	−0.105	−0.216	0.005
Stress	0.280*	0.164	0.393	−0.025	−0.146	0.090
Physical QOL	−0.167*	−0.260	−0.081	0.042	−0.065	0.142

Note. *$p < .05$. BC CI, bias-corrected and accelerated confidence interval; QOL, quality of life; DIDF, difficulty identifying and describing feelings; Time 1 measures controlled in all analyses. [a]The indirect effect (A × B in Figure 1) of PF through emotional awareness on mental health. [b]The indirect effect (A × B in Figure 1) of DIDF through PF on mental health.

DIDF. None of the direct effects between PF and mental health were significant when DIDF was entered in the model (see, e.g., Table 3), suggesting that DIDF fully mediated the relationship between PF and mental health. We tested the reverse model (DIDF leading to PF) and found no evidence for an indirect effect (Table 4). These analyses are consistent with DIDF, rather than PF, being the mediator. DIDF fully mediated the relationship between PF and each mental health measure. Participants who indicated high levels of PF were more likely to have low levels of DIDF and, through low levels of DIDF, less likely to have worse mental health (e.g., depression).

Discussion

We examined the influence of DIDF and PF on men with HIV undergoing anal cancer screening. Three models of influence were proposed. Neither the situational or interaction model was supported, in that greater health threat did not predict changes in mental health, nor did DIDF and PF reduce the impact of threat on mental health. The resilience model had consistent support. Generally, people who had low DIDF and high PF at Time 1 tended to experience increases in mental health at Time 2, relative to those with high DIDF and low PF at Time 1 and the same baseline level of mental health. DIDF had a direct effect on mental health change, whereas PF had a significant indirect effect through DIDF.

Our results show that lower DIDF predicted less depression, anxiety and stress and higher levels of mental and physical QOL. This is consistent with other studies showing that emotion-related skills are protective against a variety of poor psychological outcomes (e.g., see Kashdan and Rottenberg's (2010) review of PF). More specifically, when DIDF was high, past research suggests that patients with dermatitis had lower global assessment of functioning scores (Picardi *et al.*, 2007), medical students and their confederates had higher psychological distress (Berrocal *et al.*, 2009), and undergraduate students in both a cross-sectional and 3-week diary study displayed greater anxiety symptoms and diminished psychological functioning (Kashdan, Barrios, Forsyth, & Steger, 2006). A longitudinal study of males from the general population in Finland showed higher mental and physical QOL when alexithymia was lower (Saharinen *et al.*, 2008).

Psychological flexibility has shown cross-sectional and longitudinal links to mental health (Berrocal *et al.*, 2009; Bond & Bunce, 2003; Donaldson-Feilder & Bond, 2004; Hayes *et al.*, 2006; Karekla & Panayiotou, 2011; McCracken & Zhao-O'Brien, 2010; Wicksell *et al.*, 2008). We replicated this finding in the present study. However, unlike past studies, we included a measure of the ability to identify and describe feelings. We found that the link between PF and mental health is entirely mediated by DIDF in this medical screening context. Research by Baer and colleagues (Baer, Lykins, & Peters, 2012; Baer *et al.*, 2008) in the area of mindfulness has shown similar patterns. Long-term meditators had increased describing skills that mediate their increase in psychological well-being.

These results need to be viewed with caution as we used self-report rather than ecologically salient emotional recording. Measuring the predictor variables and mediators at the same time limited our ability to determine whether PF enhances DIDF or DIDF enhances PF. We found no evidence that the medical test results impacted general mental health, the focus of the present study; however, there was a difference in cancer-related worry and ratings of anal and future health. These findings are examined in more detail in the study by Landstra, Ciarrochi, Deane, Botes, and Hillman (2012). Our participants may have handled the process more easily due to being accustomed to regular health checks as a function of having HIV. Nevertheless, the prospective longitudinal nature of this study extends previous research by suggesting that the ability to identify and describe feelings and PF helps men with HIV to experience positive changes in mental health over time.

It may be that being more psychologically flexible is an antecedent to promoting the ability to identify and differentiate the nuances of pleasant and unpleasant emotions, which in turn enhances an individual's mental health. Studies have shown that men may be particularly vulnerable to poor adjustment to stressful life events because they are thought to have more difficulties identifying and describing emotions and lower PF than women (Karekla & Panayiotou, 2011; Mattila *et al.*, 2008). A study of men infected with HIV (Lumley *et al.*, 1997) found that while disease severity was not impacted, symptom reports and illness behaviours were greater in men with higher DIDF.

This study has shown that both DIDF and PF are important and appear to promote mental health in a group of men with HIV. More research is needed to understand the links between PF and DIDF: for example, using ACT to experimentally increase PF, and assessing whether the ability to identify and describe feelings subsequently improves; and conversely to improve the identification and description of feelings to see whether this leads to improvements in PF. The present results suggest the former, and not the latter, will be the best model.

These results have important implications for the many health screening programmes now available. While screening programmes can prevent disease, small adverse effects on the majority of those screened could impact general public health (Stewart-Brown & Farmer, 1997). Using measures of PF and emotion identification/description to identify participants low in these abilities may assist to triage those who need the offer of extra support aimed at assisting them to process the emotions arising from their health condition (van Middendorp *et al.*, 2008). ACT interventions may be well suited as the review by Ruiz (2010) notes that 'extremely short interventions' have been efficacious.

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