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ORIGINAL PAPER

Predictors of Resilience and Posttraumatic Growth Among People Living with HIV: A Longitudinal Study

Helena Garrido-Hernansaiz[1] · **Patrick J. Murphy**[2] · **Jesús Alonso-Tapia**[1]

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Abstract This longitudinal study investigated the predictors of HIV-related resilience (HR) and posttraumatic growth (PTG) among Spanish-speaking HIV-positive people. Perceived past resilience, internalised stigma, and coping strategies were hypothesised as possible predictors. Data were collected at two time points from 119 HIV-positive people. Path analyses with latent variables revealed that half of HR 8 months after diagnosis was predicted by rumination, emotional expression, positive thinking, internalised stigma, and perceived past resilience. The latter three, along with isolation, self-blame, thinking avoidance, and help seeking predicted some PTG dimensions 8 months after diagnosis. The results highlight the importance of internalised stigma associated with HIV infection and of the differential use of coping strategies, and point to the need for clinicians and policy makers to implement stigma reduction and appropriate coping strategies interventions.

Resumen Este estudio longitudinal exploró los predictores de la resiliencia relacionada con el VIH (RV) y el crecimiento postraumático (CPT) en personas hispanoparlantes VIH-positivas. Los posibles predictores incluyeron la resiliencia pasada percibida, el estigma internalizado y diferentes estrategias de afrontamiento. Hubo 119 participantes en las dos evaluaciones del estudio. Los análisis de rutas con variables latentes mostraron que la mitad de la RV ocho meses después del diagnóstico fue predicha por rumiación, expresión emocional, pensar en positivo, estigma internalizado y resiliencia pasada percibida. Las tres últimas, junto con aislamiento, auto-culpabilización, evitar pensar y buscar ayuda predijeron algunas dimensiones de CPT ocho meses tras el diagnóstico. Estos resultados subrayan la importancia del estigma internalizado asociado al diagnóstico de VIH y del uso diferencial de las estrategias de afrontamiento como predictores de RV y CPT, y señalan la necesidad de que tanto clínicos como responsables políticos implementen intervenciones destinadas a la reducción del estigma y el uso de estrategias de afrontamiento.

Keywords HIV/AIDS · Resilience · Posttraumatic growth · HIV-related stigma · Coping

Keywords VIH/SIDA · Resiliencia · Crecimiento postraumático · Estigma relacionado con el VIH · Afrontamiento

Introduction

Testing positive for HIV can be a very shocking and stressful experience, a traumatic event potentially leading to the development of posttraumatic stress disorder (PTSD) [1–3], an anxiety disorder which is much more prevalent among people living with HIV (PLHIV) than among the general population [4, 5]. Moreover, HIV diagnosis is a unique stressor in the sense that PLHIV live with stigma and discrimination to a degree that is unmatched by any other medical diagnosis in modern history [6]. While general research has traditionally focused on the negative effects of trauma, positive outcomes such as resilience or

✉ Helena Garrido-Hernansaiz
helenagarrido42@gmail.com

[1] Department of Biological and Health Psychology, School of Psychology, Universidad Autónoma de Madrid, Calle Ivan Pavlov, 6, 28049 Madrid, Spain

[2] School of Medicine, Trinity College Dublin, Dublin, Ireland

posttraumatic growth (PTG) are also possible after a traumatic experience [7, 8]. Given the potential salutary outcomes associated with resilience and PTG for PLHIV [9–11], research investigating these constructs in this population is of paramount importance, yet they have seldom been studied, particularly in longitudinal designs. The current study sought to address this gap in the literature by examining the development of PTG and resilience outcomes among PLHIV over time, and also investigated the role of perceived past resilience, coping strategies, and internalised HIV-related stigma as predictors of these outcomes.

Resilience refers to the maintenance of a relative stable trajectory of healthy functioning following exposure to a potential trauma, and it is distinctly different from recovery, which also involves the return to pre-trauma functioning levels but happens over a longer period of time [12]. However, resilience has been conceptualised in the literature in a broad sense tackling protective personality traits, processes, and outcomes [13]. Indeed, most resilience measures assess the availability of protective factors that facilitate resistance to psychopathology, instead of resilience as the healthy functioning after the adverse event [14].

In a 2013 special issue of *American Psychologist* dedicated to the topic of "HIV/AIDS: Social Determinants and Health Disparities", the importance of resilience was highlighted [15], yet there is very little information on resilience among PLHIV [16]. Most research on the topic has been of qualitative nature, where sometimes resilience has been inferred by the interviewer under unknown criteria [17, 18]. Paralleling the rest of the resilience literature, a wide variety of conceptualizations have been used, from its assessment as the mere absence of disorders [19, 20], to being conflated with regular recovery or even PTG [16, 21].

Self-reported general resilience has been used as a predictor of PTG in women with infertility [22] and PLHIV [2]. Moreover, it has been stated to influence coping behaviours in the cancer and HIV contexts [23, 24], and to be related to higher HIV medication adherence and lower viral load [11]. Thus, assessing individuals' perceptions of their own resilience (i.e., perceived past resilience) can be useful in understanding and predicting PLHIV's adaptation to the specific threat of HIV infection, though scant information is available. Moreover, research is needed particularly on the processes leading to resilience outcomes [16], that is, when resilience is understood as an outcome following a particular adverse event. In this paper, we will study the perceived degree of resilience outcomes in the face of past adverse health-related events, and also the perceived degree of a resilience outcome following the specific adverse event of HIV diagnosis.

For its part, PTG has frequently been conflated with resilience [21], but it involves not just a return to baseline functioning after a trauma but an actual improvement when compared to pre-trauma levels [7]. PTG implies learning and growing after adversities [8] and is a multidimensional construct, meaning that an individual can experience positive changes in some life areas but not in others [25]. Most PLHIV report experiencing at least some degree of PTG [2, 9, 26], with well-known benefits (e.g., lower depression, lower alcohol and drug abuse; healthier habits, increased medication adherence, stronger immune system, and lower viral load) [9, 10, 26].

The question remains about which HIV-related and personal characteristics are associated with resilience and PTG outcomes. As mentioned before, perceived past resilience can predict the use of coping strategies and the development of PTG (Hypothesis 1a) [2, 23], and we hypothesised that it would predict resilience outcomes too (Hypothesis 1b).

A second related variable is coping. Coping is defined as a cognitive or behavioral response to something appraised as stressful [3] and is a complex process that depends both on personality dispositions and environmental demands [27]. Coping responses have been organized in higher order classifications that allow for more manageable dimensions, such as problem-focused and emotion-focused coping [28]. In the HIV literature, however, most studies rely on the approach and avoidance distinction [3], which is characterized by engagement with or disengagement from the stressor. Using a global classification like approach/avoidance has some advantages such as efficient analysis and discussion of findings, but lower order classifications such as self-isolation or positive reframing are more useful to inform what strategies work with HIV-related stress [3], which is why this study will rely on this latter classification.

Coping strategies have been linked to some positive psychological outcomes in PLHIV [3]. Two coping meta-analyses found that approach coping was effective for PLHIV (i.e., related to better psychological outcomes), whereas avoidance coping was ineffective (i.e., related to worse psychological outcomes) [3, 29]. However, little is known of coping regarding resilience and PTG, especially with PLHIV. Coping strategies such as positive cognitive appraisal, active coping, and positive reframing have been associated with higher resilience in PLHIV [30, 31]. In other populations, coping has been found to be related to both resilience and PTG [32, 33], and more specifically to be a mediator of resilience outcomes [22, 34]. Thus, we expected some relationships to emerge between the use of coping strategies and resilience outcomes and PTG. As coping strategies can be predicted by perceived resilience [23], coping strategies were postulated as a mediator

between perceived past resilience, and resilience outcomes and PTG after HIV diagnosis (Hypothesis 2).

Finally, stigma is another variable central to HIV infection and related to resilience and PTG. There are various HIV stigma types (i.e., enacted, anticipated, internalised) [35], but it is internalised stigma—the devaluation and discrediting of oneself based on one's HIV [15]—which has been claimed to have the most severe consequences [36–39]. Stigma has been established as a fundamental variable for resilience achievement [15], that is, lower stigma levels would lead to higher resilience outcomes. Concerning PTG, higher internalised stigma has been found to be related to lower PTG [2, 10]. Furthermore, stigma's corrosive influence on health seems to happen through the alteration of various systems, including coping behaviours. Prospective studies have shown that those with higher stigma engage in maladaptive coping strategies, such as rumination and suppression [40]. In view of this, we expected internalised stigma to have a direct negative relation with resilience and PTG (Hypothesis 3a), as well as an indirect relationship through the use of coping strategies (Hypothesis 3b). Furthermore, as the degree to which the internalisation of HIV stigma occurs is influenced by perceived resilience [41], we expect that the latter will predict internalised stigma (Hypothesis 4).

In the present study, we sought to predict resilience outcomes and the development of PTG over time in a sample of newly diagnosed PLHIV. The hypotheses presented above (H1a, H1b, H2, H3a, H3b, H4) were used to develop the structural model shown in Fig. 1. Through rigorous testing and refinement, we sought to produce empirically-supported parsimonious models of resilience outcomes and PTG development following HIV diagnosis. These models will be of use to health professionals working to maximise salutary psychological outcomes among newly diagnosed PLHIV.

Methods

Design

Longitudinal quantitative data were collected between October 2014 and November 2016. Approval for this study was obtained from the institutional review board at the first author's university.

Participants

Participant eligibility criteria for the study were a minimum age of 18 years, HIV seropositivity, comfort with reading and writing in Spanish, and a time since diagnosis at the first assessment of no more than 100 days. Eligibility was confirmed by participation; no other means of verification were employed.

Recruitment and Procedures

Participant recruitment was conducted in two ways. First, 92 PLHIV were referred to the study by staff at a health care centre in Madrid (Spain) specialising in sexually transmitted infections. Second, several local and national HIV associations and groups from Spanish-speaking countries advertised the study through their online social networks ($n = 72$, of which 20 were not considered eligible as their time since diagnosis was longer than 100 days). There is evidence that social media can be a good and cost-effective recruitment method for hard-to-reach populations with medical conditions [42], such as PLHIV [43]. The social media recruitment strategy has recently been found a success in engaging participants in HIV studies, specifically with Spanish-speakers [44].

A total sample of 144 eligible participants provided their acceptance and completed the initial questionnaires (T0 assessment). Six months later, they were contacted again

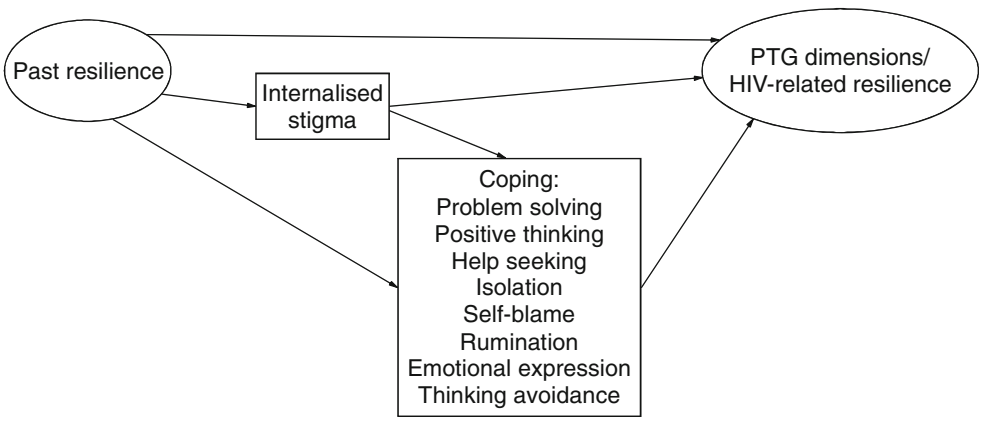

Fig. 1 Initial models to be tested. *Note* Two models were tested, one with T1 perceived HIV-related resilience outcomes as criterion, and the other with the three PTG (posttraumatic growth) dimensions, here included in the same *oval*. The eight coping strategies are shown here as a single variable

and asked to complete the second set of questionnaires. This second assessment (T1) was completed by 87 of those referred by the health care centre (attrition rate = 5%) and 32 of those recruited online (attrition rate = 38%), composing a final sample of 119 participants (total attrition rate = 17%). T0 assessments were either completed using pen-and-paper questionnaires (for participants recruited through the health centre), or online questionnaires (for those recruited elsewhere). All T1 assessments were completed online, regardless of recruitment method.

Instruments

T0 Assessment

Demographic Characteristics Participants specified the following: age, gender, sexual orientation, country of origin, relationship status, educational level, employment status, time since diagnosis, mode of transmission (sexual intercourse, injection drugs, blood transfusion/mother-to-child, other/I don't know) and connection with an HIV-related group, association, or non-profit organization (yes/no).

Perceived Past Health-Related Resilience Outcomes A four-item subscale of the Situated Subjective Resilience Questionnaire for Adults (SSRQA) [45] was used. This subscale assesses perceived resilience outcomes in the face of stress due to past health problems (e.g., "When I have had an important health issue, I have had a hard time overcoming the distress that it caused me"). Respondents rated items on a 5-point Likert scale (1 = *Strongly disagree*, 5 = *Strongly agree*). At T0, participants were instructed to respond based on their recalled experiences prior to diagnosis. The subscale showed acceptable reliability in the original study ($\alpha = .72$) and it was $\alpha = .76$ at T0 in our sample.

Internalised Stigma The HIV Internalized Stigma Scale (HIV-ISS) [46] used in this study is a self-report instrument in Spanish that evaluates the level of internalised stigma related to HIV during the last month, and consists of ten items with a 5-point response scale (1 = *Never or hardly ever*; 5 = *All or almost all the time*). Reliability was $\alpha = .94$ in the original study and .90 in our sample.

T1 Assessment

Coping Strategies We used an abbreviated, 24-item version of the Situated Coping Questionnaire for Adults (SCQA) [47], a Spanish-language measure assessing the use of eight different coping strategies (problem solving, positive thinking, help seeking, isolation, self-blame, rumination, emotional expression, and thinking avoidance) in the context of three types of stressful situations (personal relationships, health, and finances). Respondents rated items on a 5-point Likert scale (1 = *Never*; 5 = *Almost always*) to assess the degree to which each coping strategy was used in the previous month. Reliability of the coping strategies' scores was shown to be good in the original study (McDonald's ω ranging from .90 to .97). Cronbach's α was .84 for the whole questionnaire in our sample and ranged .61–.82 for the scales (see Table 1), which we deemed acceptable given the brevity and multidimensionality of the scales [59].

Perceived HIV-Related Resilience Outcomes Participants completed the same scale as in T0, but at this time-point they were instructed to respond in relation to how they had evolved psychologically after their HIV diagnosis. Reliability was $\alpha = .69$ at this time point in this sample.

Posttraumatic Growth The posttraumatic growth inventory (PTGI) [7] is the best-known measure to assess PTG. It contains 21 items with a 6-point Likert response format (0 = *I did not experience this change as a result of my crisis*; 5 = *I experienced this change to a very great degree as a result of my crisis*). Internal consistency was high in the original study ($\alpha = .95$) [7], and in a Spanish version validation study ($\alpha = .95$) [48]. In order to ensure that participants' responses referred to the experience of HIV diagnosis, the wording "as a result of my crisis" was changed to "as a result of my HIV diagnosis". As the PTGI factor structure has been shown to vary across populations (e.g., in their validation study Weiss and Berger [48] identified three factors rather than five), we used the structure found in a study of over 300 Spanish-speaking PLHIV [49]: a bifactor model of 11 items with three dimensions: changes in philosophy of life, in the self (i.e., perceptions of one's own strength), and in interpersonal relationships. The model had a good fit to the data of the current sample (SRMR = .03; RMSEA = .05; CFI = .99; see fit criteria in next section). Reliability was good for the whole scale ($\alpha = .93$) and the three dimensions (range .78–.92; see Table 1). As each dimension consisted of a different number of items, their scores were computed as the mean of the item scores, and the same was done with the whole scale score for comparability purposes.

Data Analysis

The psychometric properties of the instruments were studied in our sample, and descriptive statistics were used to describe the sample and the study variables. Structural equation modelling (SEM) was used to examine the relationships between resilience and PTG and their predictors. This type of analysis accounts for multiple relationships among variables, for measurement error, and allows testing

Table 1 Descriptive and reliability statistics for the study variables

Measure	α	Possible range	Mean	SD
Past health-related resilience (T0)	.76	4–20	13.86	3.92
HIV-related resilience (T1)	.69	4–20	14.19	3.74
Internalised stigma	.90	10–50	28.01	9.95
Coping strategies	.84	–	–	–
Problem solving	.65	3–15	11.33	2.56
Positive thinking	.81	3–15	11.69	2.71
Help seeking	.61	3–15	8.79	2.65
Isolation	.67	3–15	7.54	3.02
Self-blame	.82	3–15	8.52	3.55
Rumination	.65	3–15	8.90	2.70
Emotional expression	.64	3–15	7.21	2.50
Thinking avoidance	.66	33–15	9.29	2.74
Posttraumatic growth	.93	0–5	2.46	1.36
Philosophy of life	.78	0–5	3.02	1.54
Self	.85	0–5	2.74	1.47
Interpersonal relationships	.92	0–5	2.01	1.62

of directional relationships [50]. Weighted Least Squares Means and Variance Adjusted estimation procedure (WLSMV) was used, an adequate and robust estimator often used in applied research [51]. The standardized factor scores of the observed variables in the models (the rectangles in the Figures) were obtained and used in the estimation.

The model shown in Fig. 1 was tested twice, once with perceived HIV-related resilience outcomes (hereafter "HIV-related resilience") as the criterion, and once with PTG as the criterion. The model criterion (HIV-related resilience or PTG) was predicted by coping strategies, internalised stigma, and perceived past health-related resilience outcomes (hereafter "past resilience"). Coping strategies were predicted by internalised stigma and past resilience. Finally, internalised stigma was predicted by past resilience. The tested models were subjected to empirical respecification [50] with the aim of arriving at a parsimonious solution that can be useful to health-care professionals. The Chi square statistic, the ratio χ^2/df, the comparative fit index (CFI), the Tucker-Lewis index (TLI), and the root mean square error of approximation (RMSEA) were used to assess model fit, following recommended criteria (p for $\chi^2 > .05$; $\chi^2/df < 3$; RMSEA $\leq .08$; CFI, TLI $\geq .90$) [52]. Analyses were performed using MPlus 7 [53] for the SEM and SPSS 23 for the rest.

Results

Demographic Characteristics

The sample was composed of 119 PLHIV, of which 116 were males (98%), two were females, and one reported gender as *other*. The mean age was 32.73 years ($SD = 8.25$) and a mean of 38.78 days had passed since diagnosis at T0 ($SD = 20.43$). Fifty-seven percent of the participants were from Spain, 39% from Latin American countries (e.g., Venezuela, México, Argentina), and the rest (4%) from other countries (e.g., Italy). Regarding sexual orientation, 87% were homosexual, 11% were bisexual, and 2% were heterosexual. More than half the participants had an undergraduate degree (55%), and some had a postgraduate degree (14%). Around a quarter (28%) had a secondary education, and a small percentage (3%) had at most a primary education. The majority of the participants were single (76%), 13% were married or living with their partner, and some were divorced/separated (11%). Three quarters of the sample were employed (75%), with 13% being unemployed and the rest in different conditions (e.g., student, medical leave). Eighteen percent were connected with an HIV-related group, association, or non-profit organization, and 93% reported sexual intercourse as the mode of transmission, the rest stating that it was other or they did not know.

Descriptive Statistics

Table 1 presents the reliability and descriptive statistics of the variables in the study. Internalised stigma was highly endorsed by the participants, significantly more than in the original validation study ($p < .001$) [46]. Participants also reported moderate levels of past resilience (T0) and HIV-related resilience (T1), with no significant mean difference between them. Regarding coping strategies, positive thinking and problem solving were the ones most endorsed, while isolation and emotional expression were the

strategies least endorsed. As for PTG, the highest degree of change was in philosophy of life and the lowest in interpersonal relationships. In order to know the percentage of PLHIV who experienced significant growth, we calculated the proportion of participants who indicated growth to a moderate degree or higher [54] in the PTGI total score and in each of its three dimensions. Following this criterion, 62% of participants had experienced significant changes in their philosophy of life, 55% in the self and 34% in their interpersonal relationships. Finally, 45% had experienced overall PTG.

Prediction of Perceived HIV-Related Resilience Outcomes

The initial model was estimated and the fit indices, included in Table 2, suggested a well-fitted model which predicted 51% of the variance of HIV-related resilience ($p < .001$). Although χ^2 was significant, probably due to sample size reasons [52], the ratio χ^2/df and the remainder of the indices fell within the limits for the acceptance of the model.

In order to make the model more parsimonious, trimming was performed as follows: firstly, proximal predictors of HIV-related resilience that were not significant were removed, with past resilience and internalised stigma retained, along with the following coping strategies: rumination, emotional expression, and positive thinking. Secondly, predictors of coping strategies that were not significant were also taken out. This resulted in the removal of the paths going from internalised stigma to emotional expression and positive thinking. Table 2 shows the fit indices of this model, which were very similar to those of the initial model. Figure 2 shows the standardised regression weights of this final model, which predicted 49% of the variance of HIV-related resilience outcomes ($p < .001$).

HIV-related resilience was significantly and negatively predicted by rumination and internalised stigma, and positively predicted by emotional expression, positive thinking, and past resilience. Rumination was positively predicted by internalised stigma, and these two, emotional expression, and positive thinking were negatively predicted by past resilience. Internalised stigma did not have any significant indirect effects on HIV-related resilience. Past resilience, aside from the direct effect of .32, also had an indirect effect of .21 ($p = .001$) on HIV-related resilience, through internalised stigma and rumination.

Prediction of PTG

The initial model was estimated and the fit indices indicated that it represented the data well. Despite the significant χ^2 value, the ratio χ^2/df and the remainder of the indices fell within the limits for the acceptance of the model (see Table 2). It predicted 32% of the variance of changes in philosophy of life ($p = .01$), 60% of the variance in changes in the self ($p = .02$) and 32% of the variance of changes in interpersonal relationships ($p = .01$).

Model trimming was performed, and predictors of the three PTG dimensions that were not significant were removed. Rumination, emotional expression, and problem solving were taken out of the model. Some paths from self-blame, isolation, positive thinking, thinking avoidance, help seeking, and internalised stigma to PTG dimensions were removed. Past resilience was not a significant predictor of any PTG dimension and these paths were deleted. Then, predictors of coping strategies that were not significant were removed. As a result, the paths from past resilience and internalised stigma to help seeking were taken out, as well as the path from internalised stigma to positive thinking, and the path from past resilience to thinking avoidance. Table 2 shows the fit indices of this refined model, which were slightly better than those of the initial model. Figure 3 shows the standardised regression weights of this model, which predicted 37% of the variance of changes in philosophy of life ($p = .03$), 38% of the variance in changes in the self ($p = .12$) and 29% of the variance of changes in interpersonal relationships ($p = .03$).

Changes in philosophy of life were positively predicted by self-blame and positive thinking, changes in the self were positively predicted by thinking avoidance and negatively by isolation, and changes in interpersonal

Table 2 Model fit indices for Resilience and Posttraumatic growth

Model	% of EV	χ^2	*df*	χ^2/df	*p*	RMSEA	CFI	TLI
RES—initial	51%	115.91	82	1.41	.008	.06	.95	.91
RES—final	49%	82.92	49	1.69	.002	.07	.94	.92
PTG—initial	PL = 32%; S = 60%; IR = 32%	203.92	123	1.65	<.001	.07	.97	.95
PTG—final	PL = 37%; S = 38%; IR = 29%	178.65	114	1.56	<.001	.07	.98	.97

EV explained variance, *df* degrees of freedom, *RES* resilience, *PTG* posttraumatic growth, *PL* changes in philosophy of life, *S* changes in the self, *IR* changes in interpersonal relationships

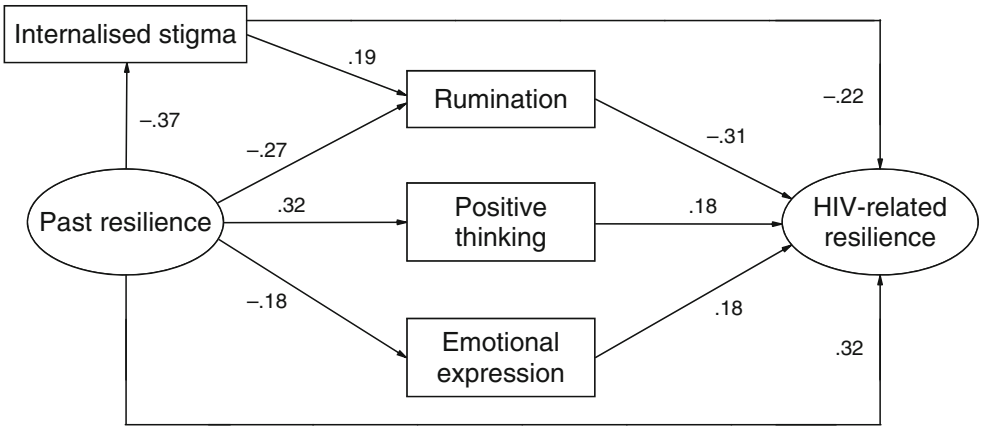

Fig. 2 Final standardised solution for the HIV-related resilience prediction model. *Note* The measurement model is not shown. *Rectangles* represent observed variables and *ovals* represent latent variables estimated through items

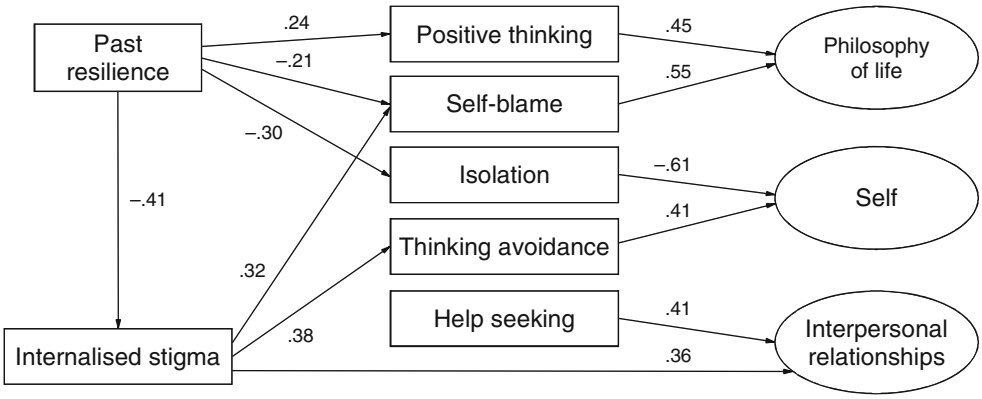

Fig. 3 Final standardised solution for the posttraumatic growth prediction model. *Note* The measurement model (including the general PTG factor) is not shown. *Rectangles* represent observed variables and *ovals* represent latent variables estimated through items

relationships were predicted in a positive way by help seeking and internalised stigma. Positive thinking and isolation were predicted by past resilience, respectively, in a positive and a negative way, and thinking avoidance was positively predicted by internalised stigma. Lastly, self-blame was negatively predicted by past resilience and positively by internalised stigma. The latter was also negatively predicted by past resilience. Internalised stigma had a total indirect effect on philosophy of life of .17 ($p = .03$) through self-blame and of .16 ($p = .10$) on the self through thinking avoidance. The total indirect effect of past resilience on philosophy of life was far from significant (–.07, $p = .38$), as well as was the indirect effect on the self (.12; $p = .19$). However, there was a significant indirect effect on interpersonal relationships through internalized stigma (–.15; $p = .04$).

Discussion

This study sought to predict HIV-related resilience outcomes and PTG in a sample of newly diagnosed PLHIV. The levels of resilience outcomes and PTG reported by participants support the notion that these positive outcomes of trauma are not uncommon [8, 12]. Moreover, internalised stigma was higher in our sample than in the original validation study, which was expected as internalised stigma has been shown to be lower with longer times from diagnosis and our participants were newly diagnosed [46, 55].

Virtually half of the variance in HIV-related resilience was explained, an important result denoting that positive outcomes after HIV diagnosis can in fact be fostered. Greater HIV-related resilience was predicted by lower rumination and internalised stigma and by higher emotional expression, positive thinking, and past resilience. The role of positive thinking is consistent with previous research on resilience in the physically ill and ageing PLHIV that reported positive associations [30, 31]. Higher internalised stigma led to lower HIV-related resilience, which was also an expected result [15]. It also led to increased rumination, a result congruent with studies which have found that people with higher stigma engage in maladaptive coping strategies like rumination and suppression [40]. Finally, past resilience had a direct positive effect on HIV-related resilience and also an indirect one through rumination and internalised stigma. This highlights the relevance of assessing the person's perception of their past experiences with adversity (i.e., perceived levels of past resilience outcomes), as it predicts the use of coping

strategies and the degree of internalisation of HIV stigma, all of which will later foster or preclude HIV-related resilience.

The proportions of explained variance of the three PTG dimensions were lower than for resilience (29–38%), although greater than those of previous findings with PLHIV [2]. Higher changes in philosophy of life were found among those who use self-blame and positive thinking as coping strategies. Higher changes in the self were predicted by higher use of thinking avoidance and lower use of isolation. Lastly, seeking help and having higher internalised stigma led to higher changes in interpersonal relationships. Moreover, internalised stigma also had a positive indirect effect through self-blame and thinking avoidance (i.e., higher internalised stigma leads to higher PTG). Finally, past resilience had a negative indirect effect on PTG through internalised stigma. That is, past resilience may decrease the levels of PTG, which is consistent with the idea that resilient individuals tend to struggle with adversity less than others, thus not being bound to engage in the meaning-making behaviours associated with PTG [21]. However, we must keep in mind that the indirect effect was small and that PTG was predicted by coping strategies and internalised stigma to a greater degree.

As can be derived from the discussed findings, in general our hypotheses were supported: past resilience predicted internalised stigma and HIV-related resilience, and coping variables acted as mediators between these and HIV-related resilience and PTG. The latter two had different patterns of association with coping variables, which suggests that indeed different mechanisms may influence their development after a traumatic experience and thus supports the usefulness of more specific lower order coping classifications [3].

The differential effect of internalised stigma on HIV-related resilience and PTG also merits attention. While higher internalised stigma leading to lower resilience outcomes was an expected result [15], the finding that higher internalised stigma leads to higher PTG levels (both directly and indirectly) is against previous literature [2, 10]. A possible explanation is based on the notion that, for PTG to occur, the adverse event has to be upsetting enough to cause considerable disruption to one's assumptions about the world [56]. It could be that, in a world where antiretroviral therapy is increasingly available and a normal life expectancy is achievable [57], HIV diagnosis is decreasingly traumatic, and sometimes it may be not traumatic enough to trigger PTG. The potentially traumatic nature of HIV diagnosis might be different across countries or cultures, as it can be influenced by a diversity of social factors (e.g., the economic, cultural, and political landscapes, access to prevention and care services, community support networks, prevailing levels of stigma). In the scenario of a potentially less traumatic diagnosis, the presence of additional stress in the form of internalised stigma may make the event traumatic enough to allow for PTG. This is a hypothesis that needs testing, after these results have been replicated in different samples.

This study has some strengths, such as its quantitative nature, quite novel in this particular research field, and the use of a resilience definition that draws from a clear psychological framework. The longitudinal design has also allowed for the establishment of temporal relationships. However, because this study is the first to examine longitudinal relations between internalised stigma, perceived past health-related resilience, coping, HIV-related resilience, and PTG in newly diagnosed PLHIV, it is premature to draw definitive conclusions about such relationships. Further replication and extension of this work are necessary with bigger samples, specially to avoid capitalization on chance [50]. Since the findings presented are based on data collected from PLHIV from Spain and Latin America, they should be generalised to other populations with caution. Additionally, the online data collection method may have resulted in a biased sample, and the use of self-report survey data has inherent limitations. Future studies should aim for longer term follow-ups with PLHIV and include more assessments so that each variable is measured at a different time-point and retrospective questions can be avoided (e.g., pre-diagnosis perceived resilience). Lastly, future research should explore whether there are more PTG dimensions relevant to PLHIV that are not considered in the PTGI, the measure typically used to assess PTG.

Our findings have implications for the promotion of positive adaptation in Spanish-speaking, newly diagnosed PLHIV. As our results showed, there were certain variables measured soon after diagnosis that helped predict HIV-related resilience and PTG—past health-related resilience outcomes and internalised stigma. Systematic evaluation of these variables following HIV diagnosis should be implemented, as health caregivers could identify those individuals who are more or less likely of achieving a resilience outcome or PTG. Then, they could help PLHIV become more aware of how well they are doing and why or teach them how to achieve positive adaptation.

As our study showed, internalised stigma and coping are central elements that could influence the achievement of resilience outcomes and PTG. Interventions aimed at improving resilience in PLHIV could benefit from reducing internalised stigma and rumination and increasing emotional expression and positive thinking. To reduce internalized stigma, interventions should address and challenge the beliefs on which stigma is based. To this end, support groups are known to help PLHIV deal with stigma in a

multidimensional way [55]. Additionally, health care providers can help PLHIV overcome their internalised stigma and thus they should be given strategies to help PLHIV question their stigmatizing beliefs.

Concerning coping strategies, a positive adaptation might be achieved by modifying the behaviours that a person uses to face adversities. Specifically, chances for emotional expression should be given to newly diagnosed PLHIV and it should be encouraged in health care settings, as this coping behaviour is among the strategies the least used by this population and its use was associated to higher resilience. Similarly, rumination should be discouraged and positive thinking encouraged. A possible way of implementing this coping intervention is by providing coping training, which has been shown to be more effective in PLHIV than actively receiving information and that being on a waiting list [32, 58]. Additionally, mindfulness training has been shown to reduce rumination and emotion suppression and increase awareness of emotions in other stigmatised groups [59, 60] and thus would be a possible intervention to foster resilience that merits attention in future research with PLHIV.

Concerning PTG, interventions aimed at fostering it should promote the use of positive thinking, help-seeking, and thinking avoidance and discourage isolation. To this aim, coping behavioural interventions or workshops could be implemented, as described before. Moreover, in order to foster help-seeking behaviours and reduce isolation, it might be necessary to address stigma and disclosure concerns so that PLHIV can disclose their serostatus to others to gain their help. Finally, it can be acknowledged that not all outcomes of internalised stigma or maladaptive coping strategies (e.g., self-blame) are inherently harmful, as they can lead to benefit-finding. This being said, we would not recommend to increase internalised stigma or self-blame in this population, as these variables have other negative consequences that should be avoided. Nevertheless, once present, it could be useful to foster their cognitive processing so that PLHIV can find benefit and grow and so that the levels of these variables decrease.

Conclusion

Positive outcomes such as resilience and PTG are possible in the aftermath of an HIV diagnosis and are indeed present in a high proportion of newly diagnosed PLHIV. Thus, they should be systematically assessed to avoid fostering an incomplete and biased view of the psychological impact of an HIV-positive diagnosis. Moreover, interventions to facilitate adjustment to an HIV-positive diagnosis should not only aim to prevent psychopathology, but also aim to promote healthy functioning and meaning-making. In achieving these aims, the important role of coping strategies and internalised stigma should not be overlooked.

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Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in this study were in accordance with the ethical standards of the institutional research ethics committees and with the 1964 Helsinki Declaration and its later amendments. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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