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Clinical Psychology in Europe

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Editorial

Towards Integration and Impact: Clinical Psychology Takes Action for Mental Health in Europe

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From October 31 to November 2, 2019, the first conference of the new European Association of Clinical Psychology and Psychological Treatment (EACLIPT) took place at Technische Universität Dresden, Germany (Beesdo-Baum et al., 2019). It was a historic moment that brought together clinical psychologists from many different regions of the world. About 300 researchers and psychotherapists discussed the most recent developments in clinical psychology, possibilities for outreach, collaboration across countries, improvement of therapy delivery and the science-policy dialogue. With their inspiring presentations, they brought to life one of the main goals of EACLIPT: fostering exchange among clinical psychologists from all over Europe (Andersson, 2019). The five renowned keynote speakers reflected the diversity of topics at #EACLIPT2019: Claudi Bockting (University of Amsterdam) called for more engagement with European politicians to raise awareness for mental health and the efficacy of psychological treatments. Presenting the Improving Access to Psychological Therapies program (IAPT; Clark, 2018), David Clark (University of Oxford) demonstrated that such engagement can be extremely fruitful. New developments in psychotherapy were presented by Susan Bögels (University of Amsterdam) on mindfulness in families and by Maria Karekla (University of Cyprus) on e-mental-health tools. Stefan Hofmann (Boston University) integrated different novel approaches in his talk on Modern Process-based Cognitive Behavioral Therapy.

The scientific program included symposia and posters on novel developments in the field of mechanisms underlying mental disorders, epidemiology, prevention, diagnostics, psychotherapeutic treatment, and methods. Thus, the full spectrum of clinical psychology and psychological intervention was represented at the conference. The program also included three stimulating panel discussions on current topics of clinical psychology. The first discussion addressed the theme of the conference “No Health without Mental Health” and focused on how to move forward in research as well as on how clinical psychology can contribute to European initiatives. The discussion on "Psychotherapy and Psychotherapy Training across Europe" addressed the problem of immense heterogeneity in national regulations of clinical psychology and psychological treatment. The differences across European countries pose problems for collaborative research initiatives and exchange in education; potential solutions were discussed (Laireiter & Weise, 2019). "Challenges and Innovations for Psychotherapy" was the topic of the final panel which focused on transdiagnostic research strategies as well as new innovative mechanism-based interventions and online therapies. Although we can only transmit a brief idea of the rich panel discussions, we can subsume that they covered highly relevant topics and stimulated reflections about the current situation in clinical psychology, and brought together knowledge, experiences and insights into future perspectives by professionals from diverse fields and different countries.

Figure 1. Panel Discussion "No health without mental health", Discussants: Tanja Endrass, Philipp Kanske, Stefan Hofmann, Claudi Bockting, Agnieszka Popiel, Martin grosse Holtforth. Photo and copyright by Michael Höfler, published under a CC-BY 4.0 license.

Besides the official scientific program, additional pre- and post-conference workshops were held on “Psychopathology and the Social Brain” (Philipp Kanske and Jan Haaker, funded by Die Junge Akademie), “Suicide Prevention in Germany” (Susanne Knappe, funded by the Federal Ministry for Health), “Ubiquity - New Perspectives on Experienced Traumata” (Philipp Kanske and Miriam Akkermann, funded by Die Junge Akademie), and an Early Career Research Workshop (Lara Maliske and Susanne Knappe, supported by Springer Nature). During the members meeting, Claudi Bockting was elected as the new president of EACLIPT. With her motivation for more political engagement she will push for increasing awareness for mental health at the European level. Finally, we would like to highlight the great posters presented at the conference and congratulate the two young researchers who were awarded the first EACLIPT poster prize: Marie-Christin Atzor (Poster title: “Tell me something good! The influence of experience reports on attitude towards psychotherapy”, University of Marburg, Germany) and Marike van Vugt (Poster title: “Using computational process of depressive rumination to predict cognitive deficits”, University of Groningen, Netherlands; funded by Wiley).

Figure 2. Postersession at the EACLIPT conference.

Beyond these specific events, most participants will keep a great memory of the stimulating and warm ambience of this meeting. People were standing together, engaged in communication and exchanging ideas, and new projects and collaborations were started. Finally, the conference would not have been possible without the great help of our colleagues in the organizing team, Hannah Niermann, Katja Beesdo-Baum, Jürgen Hoyer, and Corinna Jacobi, as well as many other contributors and everyone, who presented their work, making the conference a fantastic start for now yearly meetings of EACLIPT.

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Clinical Psychology in Europe

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Research Article

Anxiety and Depression in Cardiac Inherited Disease: Prevalence and Association With Clinical and Psychosocial Factors

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Abstract

Background: The small number of published studies indicate increased rates of anxiety and depression among patients with cardiac inherited diseases (CID). This study aimed to assess the prevalence of anxiety and depression in a New Zealand CID cohort and seek any associations with clinical and psychosocial factors.

Method: Patients on a national CID register were sent a survey; 202 of 563 contactable patients participated (36% response rate). Ages ranged from 16 to 83 years (median 53). Most had Long QT Syndrome (43%) or Hypertrophic Cardiomyopathy (34%). Questionnaires collected demographic and psychological variables, including anxiety (GAD-7), depression (PHQ-9), illness perceptions, perceived risk and social support. The registry supplied clinical and genetic characteristics.

Results: 80 participants (42%) reported features of anxiety and/or depression. 24 (13%) reached clinical levels of depression, a greater proportion than that found in the general population. Poorer perceived social support was associated with worse anxiety ($p < .001$) and depression ($p < .001$) scores. Reporting more physical symptoms ($p = .001$) (commonly not caused by the CID) was associated with poorer depression scores and greater perceived consequences of the CID was associated with greater anxiety scores ($p < .05$). Neither anxiety nor depression were associated with time since diagnosis, disease severity or type of disease.

Conclusion: Forty percent of the CID population live with some degree of psychopathology but this did not correlate with disease severity, type of disease nor time since diagnosis. Correlating factors which may be modifiable include illness perceptions, various physical symptoms and social support.

Keywords

generalized anxiety, depression, cardiac inherited diseases, long QT syndrome, hypertrophic cardiomyopathy, health psychology

Highlights

- Rates of clinical levels of anxiety and depression in this CID sample were 10% and 13% respectively.
- Anxiety and depression were not associated with disease type, severity or time since diagnosis.
- Perceived lack of support, consequences, and symptoms were associated with depression and anxiety.
- High rates of anxiety and depression in CID's indicate the need for access to psychological support.

Cardiac inherited diseases are a group of genetic heart conditions that account for many sudden cardiac deaths in individuals aged 1 to 35 years (Bagnall et al., 2016). These conditions generally fall into two categories, channelopathies, which affect the electrical processes of the heart, e.g. Long QT Syndrome (LQTS); and cardiomyopathies which cause the heart muscle to become dysfunctional and electrically unstable e.g. Hypertrophic Cardiomyopathy (HCM). The last decade has seen a dramatic rise in the detection of people with cardiac inherited diseases, which is the result of effective international efforts to reduce sudden deaths in young people (Bagnall et al., 2016; Behr et al., 2008; Hofman et al., 2013). However the psychological impact of such detection has been under researched and is only just starting to be explored. The few studies performed to date suggest these individuals are particularly vulnerable to anxiety and depression, with prevalence rates found to be as high as 38% and 21% respectively (Ingles, Sarina, Kasparian, & Semsarian, 2013; Morgan, O'Donoghue, McKenna, & Schmidt, 2008; Richardson et al., 2018). These rates are considerably higher than the prevalence of anxiety (6 – 9%) and depressive disorders (5 - 8%) in general populations (Alonso et al., 2004; Kessler, Chiu, Demler, & Walters, 2005; Wells et al., 2006). However, the rates are in line with clinical levels of anxiety (20-25%) and depression (20-40%) in other cardiac populations (Celano & Huffman, 2011; Moser, 2007).

Cardiac inherited disease patients have shed some light on why this may be in two qualitative studies (Andersen, Øyen, Bjorvatn, & Gjengedal, 2008; Subasic, 2013). Patients report that they struggle with the uncertainty of the trajectory of their disease; their increased risk of sudden cardiac arrest; and identifying whether their symptoms are normal or sinister. Patients report a physical burden associated with living with these conditions, including symptoms such as extreme fatigue, palpitations and headaches, and side effects from treatment, which can in some instances get in the way of fulfilling roles at home and/or work or engaging with their social network.

Greater clinical severity and uncertainty of risk may therefore be associated with psychological outcomes. However, research on other hereditary heart diseases has found that disease severity is not the only predictor of psychological well-being (O’Donovan, Painter, Lowe, Robinson, & Broadbent, 2016). Physical symptoms (including those unrelated to the heart condition) and illness perceptions also contribute to psychological well-being.

It is well accepted that anxiety and depression have a negative influence on patient engagement and clinical outcomes (Andrássy et al., 2007; DiMatteo, Lepper, & Croghan, 2000; Ziegelstein et al., 2000). Disengagement is particularly unhelpful with cardiac inherited disease because it could impede the detection and management of the heart condition in other family members, and nonadherence can be life-threatening. Therefore it is imperative to gain a better understanding of the psychological impact of these conditions.

The aim of this study was to assess rates of anxiety and depression in the New Zealand cardiac inherited disease population and determine which clinical, demographic and psychological factors were associated with anxiety and depression. This study intentionally focused on factors that may be amenable to amelioration, including illness perceptions and social support, as these factors might help to inform the delivery of psychological interventions for this group (Broadbent, Ellis, Thomas, Gamble, & Petrie, 2009).

Methods

Study Design and Study Population

The New Zealand Cardiac Inherited Diseases Register was used to recruit participants (Earle et al., 2019). Eligible patients had a ‘definitely’ or ‘probably’ affected clinical status and a genetic status of ‘positive’, ‘uninformative testing’ or ‘unclassified variant’. Over 15 years of age and proficiency in English were also required. Multi-regional ethical approval was given 9th December 2016 (HDEC Ethics Ref: 16/STH/200)

There were 618 individuals who were identified as eligible; invitations were sent to them in May 2017. However, 55 of these eligible patients were non-contactable due to out of date contact details. A total of 202/563 contacted individuals returned questionnaires within three months (36% response rate); 361 patients did not participate - ‘non-participants’. Demographic information for participants is shown in Table 1. The questionnaire collected data on anxiety and depression and a number of other psychological and clinical variables, as follows.

Table 1

Demographic and Clinical Variables of Cardiac Inherited Disease Participants

Characteristic	***n* (%)**
Demographic Characteristics	
Age: Range (median)	16 - 83 (53)
Sex: Female	103 (54.2)
Ethnicity	
NZ European	151 (74.8)
Māori & Pacific	21 (10.4)
Māori	*19 (9.4)*
Samoan	*0 (0)*
Cook Island Maori	*1 (0.5)*
Tongan	*1 (0.5)*
Other	16 (7.9)
Chinese	*3 (1.5)*
Indian	*4 (2.1)*
Other	*9 (4.5)*
Clinical Characteristics	
Inherited cardiac condition	
Long QT Syndrome	86 (42.6)
Hypertrophic Cardiomyopathy	69 (34.2)
Dilated Cardiomyopathy	12 (5.9)
Brugada	6 (3.0)
Other	21 (8.5)
ARVC	*5 (2.5)*
CPVT	*6 (3.0)*
Sudden Cardiac Arrest Syndrome	*3 (1.5)*
Progressive Cardiac Conduction disorder	*3 (1.5)*
Diagnosis missing	12 (5.8)
Clinic Status	
Definitely affected	145 (71.8)
Probably affected	42 (21.8)
Genetic Status	
Positive	110 (54.5)
Testing uninformative	57 (28.2)
Unclassified variant	20 (9.9)

Characteristic	***n* (%)**
Proband	
True	121 (59.9)
False	66 (32.7)
β-Blocker use	131 (64.9)
Number of years since diagnosis: Range (median)	0 – 51 (9)

Note. Participants $n = 202$.

Measures

Depression was assessed using the Patient Health Questionnaire – 9 (PHQ-9) (Kroenke, Spitzer, & Williams, 2001). This tool has 9 items that measure how often, in the last two weeks, symptoms of depression have occurred. Responses are recorded on a 4-point scale from 0 – “not at all” to 3 – “nearly every day”. The PHQ-9 has been validated against clinical interviews with the following cut-off scores, 5 – 9 ‘mild cases’; 10 – 14 ‘moderate cases’; 15 – 19 ‘moderately severe cases’; and ≥20 ‘severe cases’ (Kroenke et al., 2001).

Anxiety was measured using the Generalized Anxiety Disorder – 7 (GAD-7) (Spitzer, Kroenke, Williams, & Löwe, 2006). This assessment tool has 7 items and follows the same structure as the PHQ-9 asking how often symptoms of anxiety have occurred. The GAD-7 has been validated against clinical interviews and the following cut-off scores were established, 5 – 9 ‘mild cases’; 10 – 14 ‘moderate cases’; 15 – 21 ‘severe cases’ (Spitzer et al., 2006).

The Brief Illness Perception Questionnaire (Brief IPQ) (Broadbent, Petrie, Main, & Weinman, 2006) assesses an individual’s cognitive and emotional representations of their illness. It contains eight items, with a 0 – 10 response format; assessing people’s experience of symptoms (*identity*); perceptions of *personal* and *treatment control*; perceived *timeline* for the illness, the *consequences* it has on their life; how *concerned* they are about it; how much they understand the illness (*coherence)* and how much it affects them emotionally (*emotional representation*). The ninth item measures perceptions around cause and was not used in the analysis of this study.

Perceptions of risk were measured using questions based on Bjorvatn and colleagues’ (2007) risk questions. One item was used in the analysis, which asked participants to report their perceived chance (0-100%) of experiencing severe symptoms (e.g. cardiac arrest, sudden cardiac death).

The Problem List is an assessment tool used to identify sources of distress in oncology patients (Holland & Bultz, 2007). Minor changes were made to the problem list for this study so items were specific to this cardiac population. For example, mouth sores were removed and palpitations were added. It includes practical problems with ‘changes to finances’, ‘work or school’ and taking medication; family problems with ‘communicating with extended family’, ‘fulfilling roles within the family’ and ‘planning to have children’; emotional problems such as ‘distress’, ‘isolated/feeling alone’ and ‘worried’; physical problems such as ‘blackouts/faints’, ‘breathing’ ‘cold hands and feet’, and ‘fatigue/tiredness’; and spiritual/religious concerns such as ‘loss of purpose’ and ‘why me?’. Each item was either scored zero if not identified as a problem or 1 if it was identified as a problem. Subtotals for each subscale, and an overall total were then created by the number of problems selected. This tool is a practical way for patients to highlight aspects of their life contributing to their distress levels, so support provisions can be put in place.

The STOP-D is a five item screener used commonly in cardiac populations (Young, Ignaszewski, Fofonoff, & Kaan, 2007; Young, Nguyen, Roth, Broadberry, & Mackay, 2015). The five items measure depression, anxiety, stress, anger and social support, participants are asked how much they have been bothered by each item over the last two weeks on a 10-point scale 0 – ‘Not at all’ to 9 – ‘severely’. In this instance the whole measure was not used; we utilized the social support single item which asked how much participants had been bothered by: ‘Not having the social support you feel you need?’

Clinical information was extracted from the registry including the type of diagnosis, clinical status (level of certainty of their diagnosis, i.e. definitely affected vs probably affected), genetic status (genotype positive, unclassified variant or uninformative genetic test) and proband status (proband or cascade family member).

Participants responded to clinical questions in the questionnaire including, how long since their diagnosis, whether they had been prescribed β-blockers, how many of their family members had a cardiac inherited disease diagnosis and whether any family members had died from the condition. Participants also completed demographic questions including age, gender, ethnicity and employment status.

Statistical Analysis

Missing data were left out of analysis on a case by case basis. Of the 202 participants, 20 had either missing ethnicity and beta-blocker data, clinical, genetic or proband status or did not indicate whether a death had occurred within their family. In total, 17 participants had missing data for anxiety scores, three participants could have scores imputed as no more than two items were missing. In these cases the mean of the completed five items was used as a replacement for the missing items, leaving 14 participants without an anxiety score. In total 28 were missing for depression, 15 participants had scores imputed as no more than three items were missing, again the mean of the remaining items was used as a replacement, leaving 13 participants without a depression score. Of these participants with missing data, 10 did not complete both measures. Analyses were conducted on SPSS version 24 software. Non-parametric tests were used due to non-normally distributed data and medians were used when reporting findings. Spearman correlations were conducted to determine associations between psychological variables and age, anxiety and depression. Mann-Whitney tests were performed to assess differences in anxiety and depression between those taking and not taking β-blockers, probands versus family members, and those with a definite versus probable clinical status. Comparisons were also made using the Kruskal-Wallis test to assess whether anxiety and depression differed between genetic status and a death in the family status. Hierarchical multiple regression analysis was performed using the significant variables from the above tests along with age and gender given they are consistently associated with anxiety and depression (Baxter, Scott, Vos, & Whiteford, 2013; Stordal, Mykletun, & Dahl, 2003). A total of 160 cases were included in the anxiety regression and 158 for the depression regression. A significance level of .05 was maintained apart from when post-hoc tests were performed during which a Bonferroni correction was made.

Results

Participants did not differ from non-participants on gender, genetic, proband and clinical status and type of condition; but they did differ based on age ($p < .001$) and ethnicity ($p < .001$). Those who participated were significantly older (median 53 years) compared to those who did not (median 45 years) and New Zealand Europeans were over represented in the study compared to other ethnicities (see Table 1).

Means and standard deviations for all the psychological variables are reported in Table 2.

Table 2

Means and Standard Deviations of the Psychological Variables

Psychological Variable	***M***	***SD***
Anxiety	3.37	4.28
Depression	4.62	4.60
Perceived Social Support	0.87	1.62
Perceived Risk	32.28	30.50
IP Consequence	3.73	2.96
IP Timeline	9.60	1.55
IP Personal Control	4.30	3.27
IP Treatment Control	4.59	3.35
IP Identity	2.92	2.76
IP Concern	4.50	3.23
IP Coherence	7.17	2.54
IP Emotional Representation	3.30	3.12
Problem List – Practical	1.91	2.60
Problem List - Family	0.69	1.09
Problem List – Emotional	1.62	2.61
Problem List – Physical	2.26	2.35
Problem List - Spiritual	0.21	0.52

Depression and anxiety scores ranged from 0 to 21 and 0 to 19 respectively. There were 27/192 (14%) individuals reporting clinical levels of anxiety and/or depression. Of these individuals 16 (8%) reported clinical levels of both, 4 (2%) just depression, and 7 (4%) clinical levels of one and mild levels of the other. There were, 53/192 (28%) individuals who reported subclinical (mild) levels of anxiety and/or depression. Of these individuals 23 (12%) reported subclinical levels of both, 22 (12%) just mild depression and 8 (4%) just mild anxiety. Accordingly, 112/192 (58%) participants fell in the ‘non-clinical range. Table 3 displays the proportion of people with at least mild levels of anxiety and depression by type of condition. There was no significant difference in anxiety and depression levels between the two most common conditions LQTS and HCM, $\chi^2(1, N = 146) = 3.87$, $p = .273$. Levels of anxiety and depression did not differ significantly based on gender or age (Table 3).

Table 3

The Proportion of Participants With at Least Mild Anxiety And/Or Depression by the Type of CID Condition

	***n* (%)**			
Condition	**Anxiety only**	**Depression only**	**Anxiety & Depression**	**Total**
Long QT Syndrome	6 (7)	7 (8)	23 (27)	36 (42)
HCM	1 (1)	12 (17)	16 (23)	29 (42)
DCM	0 (0)	2 (17)	1 (8)	3 (25)
ARVC	0 (0)	1 (20)	1 (20)	2 (40)
CPVT	0 (0)	0 (0)	1 (17)	1 (17)
Brugada	1 (17)	1 (17)	0 (0)	2 (33)
Sudden Cardiac Arrest Syndrome	0 (0)	1 (33)	1 (33)	2 (67)
Missing Diagnosis	0 (0)	1 (8)	3 (25)	4 (33)
Totals	7 (4)	26 (13)	46 (24)	79 (41)

Anxiety

Bivariate analyses (Table 4) showed that ethnicity was the only demographic variable associated with anxiety $U = 1919.5$, $z = -2.28$, $p < .05$. A smaller proportion of New Zealand European participants (7.5%) scored above the clinical threshold for anxiety compared to non-New Zealand European participants (17%). A Kruskal-Wallis test on ‘death of a family member due to a cardiac inherited disease’ was found to be significantly related to anxiety $H(2) = 6.31$, $p < .05$; however Mann Whitney post hoc tests using a Bonferroni correction did not reach significance between the groups (‘yes’, ‘no’, or ‘I don’t know’). Participants on beta-blockers had significantly greater clinical anxiety $U = 2952$, $z = -2.93$, $p < .01$, compared to participants not on beta-blockers (14% vs 3% respectively). Clinical, genetic and proband status and channelopathy versus cardiomyopathy were not related to anxiety. There was also no significant correlation between anxiety and time since diagnosis.

Table 4

Bivariate Analyses (Pearson Correlations, Mann-Whitney and Kruskal-Wallis Tests) of the Relationship Between Psychological, Clinical and Demographic Variables With Scores on the Anxiety and Depression Scales

	PHQ-9 - Depression		**GAD-7 - Anxiety**	
Spearman Correlations	r_s	p	r_s	p
Age	-.03	.677	-.13	.079
Time since diagnosis	.01	.939	-.09	.230
Percentage of life with diagnosis	.00	.963	-.04	.574
Problem List – Total	.69	< .001	.66	< .001
Problem List – Physical	.55	< .001	.44	< .001
Problem List – Emotional	.62	< .001	.71	< .001
Problem List – Practical	.50	< .001	.53	< .001
BIPQ – Consequence	.54	< .001	.53	< .001
BIPQ –Timeline	.01	.874	.00	.968
BIPQ – Personal Control	-.21	.004	-.17	.019
BIPQ – Treatment control	-.02	.832	-.08	.317
BIPQ – Identity	.52	< .001	.40	< .001
BIPQ – Concern	.45	< .001	.53	< .001
BIPQ – Understand	.01	.892	-.07	.352
BIPQ – Emotional Representation	.51	< .001	.62	< .001
Perceived Social Support	.39	< .001	.48	< .001
Risk Perceptions for severe symptoms (%)	.38	< .001	.40	< .001
Mann Whitney Tests	$U(z)$	p	$U(z)$	p
Beta-blockers (prescribed)	3179 (-2.32)	.02	2952 (-2.93)	.003
Parent (not being a)	2585.5 (-1.61)	.107	2428.5 (-1.95)	.051
Gender	3709.5 (-1.04)	.297	3850.5 (-0.53)	.596
Cardiomyopathy vs Channelopathy	3923.5 (-0.47)	.637	3839.5 (-0.58)	.563
Proband (true)	2885 (-2.34)	.019	3095.5 (-1.72)	.085
Clinical	2749 (-0.35)	.730	2372.5 (-1.44)	.150
Ethnicity (Non-European)	1935 (-2.58)	.010	1919.5 (-2.28)	.022
Kruskal Wallis Tests	$H(2)$	p	$H(2)$	p
Genetic Status	0.53	.777	0.09	.958
Death of a family member (Don't know vs No)	9.42	.007	6.31	.043

Note. z = z score.

The psychological variables associated with anxiety in the bivariate analyses (Table 4) included the number of physical and practical problems reported, illness perceptions (consequences; personal control; identity, concern, and emotional representation), perceptions of risk and social support.

Hierarchical multiple regression analysis (Table 5) was conducted and significant variables from the bivariate analyses and age and gender were entered into the model to predict anxiety.

Table 5

Regression Analysis to Investigate Predictors of Anxiety in Individuals With a Cardiac Inherited Disease

				95% CI for B	
Steps	**B**	***SE* B**	**β**	**LL**	**UL**
Step 1					
(Constant)	5.68	1.98		1.78	9.59
Age	-0.04	0.02	-.18*	-0.08	-0.01
Gender	0.31	0.64	.04	-0.95	1.57
Ethnicity (European vs non-European)	0.90	0.80	.09	-0.68	2.47
Prescribed Beta-blockers	-1.85	0.67	-.21**	-3.18	-0.52
Deaths within the Family - Yes	0.79	0.70	.10	-0.59	2.18
Deaths within the Family – Don’t Know	0.69	0.90	.07	-1.09	2.47
Step 2					
(Constant)	3.18	1.75		-.28	6.64
Age	-0.03	.02	-.10	-0.06	0.01
Gender	0.05	0.52	.01	-0.97	1.07
Ethnicity (European vs non-European)	0.08	0.69	.01	-1.29	1.46
Prescribed Beta-blockers	-1.01	0.56	-.12	-2.12	0.11
Deaths within the Family - Yes	-0.89	0.61	-.11	-2.09	0.31
Deaths within the Family – Don’t Know	-0.68	0.74	-.06	-2.16	0.79
PL - Physical symptoms	0.32	0.17	.17	-0.01	0.65
PL – Practical problems	0.16	0.15	.10	-0.14	0.46
IP – Personal Control	-0.08	0.08	-.07	-0.23	0.08
IP – Consequence	0.33	0.14	.24*	0.05	0.61
IP – Identity	-0.11	0.15	-.08	-0.39	0.18
IP – Concern	0.15	0.11	.12	-0.08	0.37
Risk Perception – Severe symptoms	-0.00	0.01	-.03	-0.03	0.02
Perceived Social Support	0.79	0.17	.34***	0.47	1.12

Note. CI = confidence interval; LL = lower limit; UL = upper limit.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

All significant Brief IPQ items were included in the regression except emotional representation due to its conceptual overlap with the outcome variable. Ethnicity, age, gender, beta-blocker and death of a family member variables were entered in Model 1, and explained 9% of the variance in anxiety scores $F(6, 153) = 2.65$, $p = .018$. Being younger and prescribed beta-blockers ($p = .007$) were significant independent predictors in Model 1.

After entering physical (symptom reports) and practical problems, perceptions of personal control, consequences, identity, concern, risk and social support at Model 2, the total variance explained by the model as a whole was 46% ($R^2 = .46$, adjusted $R^2 = .41$), $F(14, 145) = 8.76$, $p < .001$. The variables in Model 2 explained an additional 37% of the variance in anxiety, $F_{\text{change}}(8, 145) = 12.18$, $p < .001$. In the final model higher perceptions of consequences ($p = .021$) and perceptions of poorer social support ($p < .001$) were significantly associated with greater anxiety.

Depression

Ethnicity was the only demographic variable related to depression $U = 1935$, $z = -2.58$, $p < .05$ (Table 4). Overall, more non-New Zealand European participants (16%) reported clinical levels of depression than New Zealand European participants (11%).

Reports of whether a family member had died due to a cardiac inherited disease was significantly related to depression $H(2) = 9.42$, $p < .01$. Mann Whitney post hoc tests using a Bonferroni correction showed a significant difference between those who had lost a family member and those who reported they had not (13% vs 11% respectively reported clinical levels of depression) $U = 1963.5$, $p = .008$; and between those who didn't know if they had lost a family member and those who reported they had not (16% vs 11% respectively reported clinical levels of depression) $U = 812.5$, $p = .014$.

Those participants prescribed beta-blockers had significantly greater depression scores than those not prescribed them $U = 3179$, $z = -2.32$, $p < .05$ (16% vs 6% respectively reported clinical levels of depression). Probands had significantly greater depression scores compared to family members $U = 2885$, $z = -2.34$, $p < .05$ (14% vs 8% respectively reported clinical levels of depression). Clinical and genetic status, channelopathy versus cardiomyopathy, and time since diagnosis were not significantly related to depression.

The psychological variables associated with depression in the bivariate analysis (Table 4) mirrored the anxiety results. Depression scores were significantly related to the number of physical and practical problems participants reported, illness perceptions (consequences, personal control, identity, concern, and emotional representation), perceptions of risk and social support.

A hierarchical multiple regression analysis (Table 6) was conducted using significant variables from the bivariate analysis (again, the emotional representation item from the Brief IPQ was left out due to its conceptual similarity with the outcome variable) and age and gender. Ethnicity, age, gender proband status, beta-blocker and death of a family member variables were entered in Model 1; they explained 12% of the variance in depression scores $F(7, 150) = 3.04$, $p = .005$. A death in the family ($p = .006$) and being a proband ($p = .035$) were significant variables in Model 1. In Model 2, physical and practical problems, perceptions of personal control, consequences, identity, concern, risk and social support were entered, and the total variance explained by the model as a whole was 50% ($R^2 = .50$, adjusted $R^2 = .\ 45$), $F(15, 142) = 9.39$, $p < .001$. The variables in Model 2 explained an additional 38% of the variance in depression, $F_{\text{change}}(8, 142) = 13.21$, $p < .001$. In the final model greater reported physical problems ($p < .001$) and perceptions of poorer social support ($p < .001$) were significantly associated with greater depression scores.

Table 6

Regression Analysis to Investigate Predictors of Depression in Individuals With a Cardiac Inherited Disease

				95% CI for B	
Steps	**B**	***SE* B**	**β**	**LL**	**UL**
Step 1					
(Constant)	7.21	2.39		2.48	11.94
Age	-0.03	0.02	-.12	-0.08	0.01
Gender	0.00	0.73	.00	-1.45	1.45
Ethnicity (European vs non-European)	1.43	0.89	.13	-0.34	3.19
Prescribed Beta-blockers	-1.24	0.78	-.12	-2.78	0.29
Deaths within the Family - Yes	2.24	0.80	.24**	0.66	3.82
Deaths within the Family – Don't Know	1.14	1.02	.09	-0.88	3.16
Proband Status	-1.63	0.77	-.17*	-3.15	-0.12
Step 2					
(Constant)	4.04	2.13		-0.16	8.25
Age	-0.02	0.02	-.08	-0.06	0.01
Gender	-0.54	0.59	-.06	-1.71	0.62
Ethnicity (European vs non-European)	0.48	0.78	.04	-1.05	2.01
Prescribed Beta-blockers	-0.35	0.63	-.04	-1.60	0.90
Deaths within the Family - Yes	0.42	0.68	.05	-0.92	1.76
Deaths within the Family – Don't Know	-0.33	0.83	-.03	-1.96	1.31
Proband Status	-0.77	0.63	-.08	-2.01	0.47
PL - Physical symptoms	0.72	0.19	.35***	0.35	1.10
PL – Practical problems	0.08	0.16	.04	-0.24	0.40
IP – Personal Control	-0.07	0.09	-.05	-0.24	0.11
IP – Consequence	0.29	0.16	.18	-0.02	0.60
IP – Identity	0.06	0.16	.04	-0.26	0.38
IP – Concern	-0.04	0.12	-.03	-0.29	0.20
Risk Perception – Severe symptoms	0.00	0.01	.02	-0.02	0.03
Perceived Social Support	0.75	0.18	.28***	0.39	1.12

Note. CI = confidence interval; LL = lower limit; UL = upper limit.
$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Discussion

This study found an increased prevalence of depression and anxiety in patients with a cardiac inherited disease, which supports findings from the small number of earlier studies with this patient population. Eighty (42%) participants had features of at least mild depression and/or anxiety. Time since diagnosis and milder clinical severity did not diminish the likelihood of either anxiety or depression symptoms. The diagnostic levels of depression and anxiety (13% and 10% respectively) and subclinical levels of depression (24%) in this cardiac inherited disease population were found to be higher than that in general populations (Alonso et al., 2004; Kessler et al., 2005; Wells et al., 2006). Treating psychopathology is important not only for patients’ quality of life but evidence suggests even subclinical levels of depression and anxiety can be detrimental for engagement and health outcomes (Lewinsohn, Solomon, Seeley, & Zeiss, 2000; Roest, Martens, de Jonge, & Denollet, 2010) and can be risk factors for more severe future psychopathology (Cuijpers & Smit, 2004).

This study found that perceptions of social support were associated with both anxiety and depression scores in the hierarchical regression models. Perceptions of social support are consistently associated with mental health and wellbeing across many different illness groups including cardiac populations (Hughes et al., 2004; Thoits, 2011). The current study focused on perceived social support, a subjective feeling of being supported, as opposed to received social support, the actual support provided. A perceived lack of support has been found to be a stronger predictor of greater depression than the actual support received, with studies showing a perceived sense of good social support plays a protective role in the association between chronic illness and depression (Santini, Koyanagi, Tyrovolas, Mason, & Haro, 2015).

Given these heart conditions are hereditary, multiple people within a family can be affected. It would be easy to assume there would be an inbuilt support network for patients, and this is likely the case for the majority of study participants who reported having the social support they felt they needed. However this study suggests an important minority of patients feel they do not have the social support they feel they need and this group is doing poorer psychologically. Further research is needed to better understand perceptions of social support with this specific patient population. Janney (2011) provides some insight in a qualitative study in which LQTS patients reported a perceived lack of emotional support from their social networks due to a poor understanding of the condition (i.e. the absence of visible symptoms).

The number of physical symptoms individuals reported was significantly associated with depression. The association between physical symptoms and depression is also well documented across different conditions, (Katon, Lin, & Kroenke, 2007) and likely related to the limitations physical symptoms can cause. The items most commonly endorsed by participants in this study were fatigue, palpitations, insomnia, shortness of breath with exercise, and dizziness. These are common symptoms, many of which are reported in primary care populations, and are highly correlated with anxiety and depression (Kroenke et al., 1994). It is therefore important to be aware that patient-reported symptoms may not always be related to their heart condition. Indeed, some of these symptoms would not generally be caused by a channelopathy at all, and may in fact provide an indication that anxiety and/or depression is present.

As the Common Sense Model of Illness (CSM) indicates (Leventhal, Meyer, & Nerenz, 1980), patients attempt to make sense of their symptoms, even mild ones, and may misattribute unrelated symptoms (or side effects from medication) to their cardiac condition which will affect the mental model the patient holds for their cardiac inherited disease. Although certain patient-reported symptoms may not be of direct clinical relevance to the medical management of the heart condition, it is important they get addressed.

Further support for the Common Sense Model was provided by this study, in that illness perceptions were strongly related to psychological distress. The consequence domain was a significant individual contributor to the regression model for anxiety. This is in line with a meta-analysis that included different health conditions, which found the consequence domain consistently predicted the presence of anxiety (Broadbent et al., 2015). Other illness perceptions (personal control, identity and concern) and risk perceptions were associated with anxiety and depression as well. Illness perceptions represent malleable aspects of a patient's experience that could be targeted in an intervention (Broadbent et al., 2009). Longitudinal research is needed to better understand the relationship between perceived social support and illness and risk perceptions and anxiety and depression over time.

This study found that time since diagnosis (median 9 years) and disease severity were not associated with depression or anxiety. It is intuitive to think that the longer someone has a health condition the better they will become at integrating it into their life and coping with its consequences (Morgan et al., 2008). However, studies of other cardiac conditions have shown similar findings (Pelletier et al., 2014), indicating even patients with mild disease can be vulnerable. This study also supports research that found the prevalence of anxiety and depression does not differ between the two most common cardiac inherited diseases, long QT syndrome and hypertrophic cardiomyopathy (Hamang, Eide, Rokne, Nordin, & Øyen, 2011) which is worth investigating further, given the very different disease trajectories these conditions have. HCM is a progressive condition of heart muscle thickening and dysfunction and reminder symptoms such as shortness of breath on exertion are common in advanced disease. LQTS is non-progressive, and the only symptoms anticipated are syncope, or cardiac arrest. Further research may help to establish which features in common are the most important (such as hereditability and risk of sudden death), as well as the dominant findings here which seem to be common to many diseases in general, such as the importance of a good social support infrastructure.

Although cardiac inherited disease patients are likely to be vulnerable to distress early on (which research shows usually dissipates) (Hendriks et al., 2008), living with these conditions day to day may create an on-going vulnerability to anxiety and depression regardless of severity or how long someone has had the condition. The American Heart Association and American College of Cardiology recommend that there is an integration of psychological screening, assessment and intervention into cardiac care across the life span of patients with a congenital heart disease (Warnes et al., 2008). The existing research would suggest it is time to consider similar recommendations for cardiac inherited disease patients.

Clinical Implications

The fact that 14% of patients had clinical levels of psychopathology and 28% had subclinical levels regardless of clinical severity or time with the condition, suggests that psychological support should be made available to this patient population. The finding that non-Europeans had higher psychological morbidity indicates that ethnic minorities, most notably Māori and Polynesian peoples in this study, will need specific attention.

Limitations

There are some limitations to this research. Although a 36% response rate is in accordance with postal and web based surveys (Shih & Fan, 2008), it means this sample may not be representative of the population as a whole. It is difficult to know whether anxiety and depression are therefore underrepresented or overrepresented in this study. When people are choosing to take part in a voluntary survey they balance the interest, value, and personal relevance of it with the cost in time, energy and resources required to complete it (Groves, Cialdini, & Couper, 1992). It is feasible that individuals suffering from anxiety and depression could come to a decision from either side of that equation. Compounding this issue of sample representativeness is the fact that younger and ethnic minorities were under-represented and the questionnaire was only provided in English, creating a potential bias around English language proficiency. This is also cross-sectional data and no direction of relationship can be determined.

Conclusion

This study found anxiety and depression were more prevalent in the cardiac inherited disease population than in the general population and a perceived lack of social support was significantly associated with both. In addition the presence of more physical symptoms (not necessarily specific to the heart condition) was associated with an increased risk of depression and more severe perceptions of the consequences of the heart condition was associated with anxiety. The presence of a mild cardiac phenotype, and having had the condition for a long time do not appear to be protective of poor psychological wellbeing. Future research should investigate these associations in a longitudinal study to help inform psychological interventions with this patient population.

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Data Availability: Data was collected with the ethics requirement that patients' data is confidential and will not be shared. However any requests for de-identified data should be directed to the corresponding author.

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Research Article

Further Specifying the Cognitive Model of Depression: Situational Expectations and Global Cognitions as Predictors of Depressive Symptoms

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Abstract

Objectives: The cognitive model of depression assumes that depressive symptoms are influenced by dysfunctional cognitions. To further specify this model, the present study aimed to examine the influence of different types of cognitions on depressive symptoms, i.e., situational expectations and global cognitions. It was hypothesized that situational expectations predict depressive symptoms beyond global cognitions.
Design: The present study examined a clinical (N = 91) and a healthy sample (N = 80) using longitudinal data with a baseline assessment and a follow-up five months later. Although the study was not designed as an interventional trial, participants from the clinical study received non-manualized cognitive-behavioral treatment after the baseline assessment.
Methods: We examined situational expectations, intermediate beliefs, dispositional optimism, and generalized expectancies for negative mood regulation as predictors of depressive symptoms. Hypotheses were tested using multiple hierarchical linear regression analyses.
Results: Results indicate that, although there were significant correlations between the cognitive factors and depressive symptoms, in both samples neither global cognitions, nor situational expectations significantly predicted depressive symptoms at the five-month follow-up.
Conclusions: The present study could, contrary to the hypotheses, not provide evidence for a significant impact of cognitive vulnerabilities on depressive symptoms, presumably due to high drop-out rates at follow-up. Limitations of the study and directions for future research are critically discussed.

Keywords

expectation, expectancy, depression, cognitive model, behavioral experiment

Highlights

- Situational and global cognitions were examined as predictors of depressive symptoms.
- In a healthy and a clinical sample, cognitive factors were correlated with depressive symptoms.
- However, in both samples depressive symptoms at follow-up were not predicted by cognitive factors.

Since Beck's early studies from the 1960s (Beck, 1963, 1964), numerous studies have provided evidence for cognitive vulnerabilities among people suffering from major depressive disorder (MDD) (Mathews & MacLeod, 2005; Scher, Ingram, & Segal, 2005; Wenze, Gunthert, & Forand, 2010). In particular, it has been assumed that people suffering from MDD have dysfunctional cognitions such as negative automatic thoughts, intermediate beliefs and dysfunctional core beliefs. These cognitions are supposed to influence the development and maintenance of depressive symptoms (Beck, Rush, Shaw, & Emery, 1979). This cognitive model of depression has significantly influenced research on depression for decades and has promoted the development of cognitive-behavioral treatment. Recently, however, it has been argued that the concept of "cognition" in the traditional cognitive model might be too broad and could benefit from further specification (Rief & Joormann, 2019). In fact, the precise influence of different types of cognitions on depressive symptoms has rarely been studied directly up to now. Therefore, the present study aimed to examine the influence of different types of cognitions that differ in their generalizability vs. specificity and the extent to which they relate to future events or experiences.

On a temporal level, cognitions can be related either to the past, the present or the future. The subgroup of cognitions that relates to future events or experiences is referred to as expectations (Kirsch, 1985; Olson, Roese, & Zanna, 1996). More specifically, expectations may relate both to the probability of occurrence of a particular event or experience and to the consequences thereof; this can be conscious or unconscious (Laferton, Kube, Salzmann, Auer, & Shedden Mora, 2017). While human beings are quite trained in coping with momentary unpleasant feelings, such as pain or sadness, this dramatically changes if people expect these unpleasant conditions to last forever, or to be repeated frequently in the future (Rief & Joormann, 2019). Therefore, Rief and Joormann have argued that expectations regarding the stability of future experiences may have considerable impact on human well-being. In line with this notion, several studies have shown that negative future expectations influence the development of depressive symptoms (Horwitz, Berona, Czyz, Yeguez, & King, 2017; Strunk, Lopez, & DeRubeis, 2006; Vilhauer et al., 2012). This is consistent with Beck's 'cognitive triad' (Beck et al., 1979). The impact of negative expectations on future well-being is also supported by research on 'affective forecasting' (Wilson & Gilbert, 2003). According to this literature, dysphoric people tend to be biased in predicting future emotional states towards the overestimation of negative emotional reactions to future events (Hoerger, Quirk, Chapman, & Duberstein, 2012; Marroquín & Nolen-Hoeksema, 2015).

According to Laferton et al. (2017), expectations can vary in their degree of specificity vs. generalizability. Situation-specific expectations (also referred to as 'situational expectations') such as, "When I ask someone for help, I will be rejected", represent predictions of specific events or experiences in a particular situation. In contrast, generalized or global expectations can apply to various areas of life (e.g., "I hardly ever expect things to go my way"). Relatedly, due to their "if-then" structure, situational expectations might be more easily amenable to an empirical test of their validity compared to global expectations, e.g., through behavioral experiments. With reference to the cognitive model of depression (Beck et al., 1979), it has been hypothesized that situational expectations may constitute an important link between global beliefs, such as intermediate beliefs and dispositional optimism, and depressive symptoms. This hypothesis could recently be confirmed: the effects of both intermediate beliefs and dispositional optimism on depressive symptoms were mediated via situational expectations (Kube et al., 2018a, 2018b). To add to this line of research, the present study used longitudinal data of both healthy and depressed people to compare the predictive values of situational vs. more global cognitions in the context of depressive symptoms.

In the current work, three constructs were used as indicators for generalized cognitions. These three constructs were chosen because they have often been studied in depression research, and because there are well validated measurement tools to assess them. First, we considered dispositional optimism, arguably the most prominent concept of generalized expectations (Laferton et al., 2017). Dispositional optimism has been defined as 'the tendency to believe that one will generally experience good vs. bad outcomes in life' (Scheier & Carver, 1985). Previous research has consistently linked optimism to depression (Korn, Sharot, Walter, Heekeren, & Dolan, 2014; Strunk et al., 2006; Thimm, Holte, Brennen, & Wang, 2013). Dispositional optimism can be assessed with the Life Orientation Test, the most recent form of which was presented by Scheier, Carver, and Bridges (1994). Second, another construct reflecting rather generalized expectations has been introduced by Catanzaro and Mearns (1990): they focused on generalized expectancies for negative mood regulation, and defined this construct as 'the generalized expectancy that some behavior or cognition will alleviate a negative mood state'. Similar to dispositional optimism, these expectancies, assessed with the Generalized Expectancies for Negative Mood Regulation Scale (Catanzaro & Mearns, 1990), have been found to be associated with depressive symptoms (Backenstrass et al., 2006). Third, we considered intermediate beliefs, a central construct of the traditional cognitive model reflecting global attitudes and assumptions regarding oneself and life in general. Intermediate beliefs can be measured using the Dysfunctional Attitudes Scale (Oliver & Baumgart, 1985). It has been shown that intermediate beliefs predict the development of depressive symptoms (Alloy, Abramson, Whitehouse, & Hogan, 2006; Jarrett et al., 2012), and are associated with the severity of depressive symptoms in both healthy and clinical samples (Burns & Spangler, 2001). Importantly, although the Dysfunctional Attitudes Scale includes items that do partly measure expectations of future events or experiences, it also comprises a considerable amount of items assessing more general attitudes without a clear focus on the future. Therefore, it cannot completely be regarded as a measure of expectations.

Besides these generalized cognitions, the current study focused on situation-specific dysfunctional expectations in depression. To assess this relatively new construct, the Depressive Expectations Scale has been developed (Kube, D'Astolfo, Glombiewski, Doering, & Rief, 2017). Using a consequent “if-then” structure, this scale assesses situational expectations for different areas of personal and interpersonal life, such as expectations concerning social rejection, social support, mood regulation, and personal performance (see Appendix 1 for some sample items). The scale has been developed from a clinical point of view, with the aim of developing a tool that could be helpful in planning psychotherapeutic interventions to evaluate the validity of patients' expectations through behavioral experiments.

Aims and Hypotheses

The primary aim of the study was to examine situational expectations and more global cognitions as predictors of depressive symptoms. Dispositional optimism, generalized expectancies for negative mood regulation, and intermediate beliefs represent dysfunctional cognitions and have therefore conceptual similarities with situational expectations. Further, since all of these constructs reflect a negative view of an individual on different areas of personal and interpersonal life, they may only slightly differ with regards to their contents. They do differ, however, in terms of their situational specificity vs. generalizability: dispositional optimism, generalized expectancies for negative mood regulation, and intermediate beliefs represent more global cognitions while situational expectations are characterized by a higher level of situational specificity. We argue that due to this clear situational focus, situational expectations may predict depressive symptoms beyond global cognitions; situational expectations reflect specific predictions of everyday events, and therefore the actual occurrence of anticipated negative events (or the non-occurrence of anticipated positive events) may result in negative emotions such as disappointment or frustration, thus providing the breeding ground for symptoms of depression. Global cognitions, however, are often more abstract and less closely linked to everyday experiences, so that they are less often perceived as confirmed or disconfirmed and thus less obviously related to depression. In particular, it was hypothesized that situational expectations at baseline predict the later severity of depressive symptoms at follow-up independently from the aforementioned more global cognitions in both a healthy and a clinical sample.

Method

This study was part of a larger research project. Recently, first data from this project using a clinical sample have recently been published (Kube et al., 2018b). The present study used the same clinical sample as the previous article. While the previous article analyzed only cross-sectional data, the present study reports the longitudinal data. Additionally, the present study reports data from a healthy sample, which have not previously been published.

Participants and Procedure

Healthy Sample

Healthy individuals were recruited via mailing lists and postings at public spaces. Inclusion criteria for the healthy sample were: absence of a currently diagnosed mental disorder (self-report), age of at least 18 years, and sufficient knowledge of the German language (self-evaluation of the participants). At baseline, 80 healthy people participated in the study and completed the questionnaires online via the commercial survey platform Unipark®. Five months after the first measurement, participants were contacted by the study coordinator via Email, and they were asked to complete the questionnaires from the follow-up measure. The follow-up questionnaires were completed by 47 participants (completion rate: 58.8%). The main reason for not completing the follow-up in the healthy sample was that participants could not be contacted again due to changes in their email address (the healthy sample consisted mainly of students, and most participants used their university e-mail address, which were no longer available if they had left the university in the meantime). Participants who completed the entire study did not significantly differ from those who completed only the baseline assessment (all p values > .05; detailed statistical data can be found in the Appendix 2).

Clinical Sample

Participants were recruited at two inpatient hospitals (n = 53 and n = 18) and one outpatient clinic (n = 24) in Germany. The following inclusion criteria were used: current diagnosis of MDD according to ICD-10, age of at least 18 years, sufficient knowledge of the German language (self-evaluation of the participants). In the outpatient clinic, participants were diagnosed using the SCID interview by clinical psychologists who were appropriately trained in this interview (Wittchen, Zaudig, & Fydrich, 1997). In the inpatient hospitals, participants were also diagnosed by trained clinical psychologists using semi-structured interviews based on SCID; these semi-structured interviews were, however, short-forms of the SCID and not validated in previous studies. If patients were interested in participating in the study, they received detailed study information and gave written informed consent. Next, participants could complete the paper-pencil questionnaires on their own. Of note, in order to control for effects of later treatment (e.g. psychotherapy), participants could only participate in the study during the first two weeks after their intake at the hospital or in diagnostic phase before the beginning of the outpatient therapy, respectively. Though the study was not an interventional trial, all participants from the clinical sample received non-manualized individual cognitive-behavioral treatment after the baseline assessment.

Five months after completing the first questionnaire, patients from the inpatient clinics were sent the second questionnaire via postal service and completed it at home. Participants from the outpatient clinic received the questionnaires by their therapists or the study coordinator. Completed follow-up questionnaires were sent back to the study coordinator, which was done by 52 persons (completion rate: 54.7%). The reasons for not completing the follow-up assessment in the clinical sample included: participants could not be contacted again; participants were not willing to complete questionnaires again; although the participants initially agreed to complete the follow-up questionnaires, they did not return the questionnaires in the end. Completers did not significantly differ from non-completers (all p values > .05; detailed statistical data can be found in the Appendix 2).

Data collection lasted from May 2016 to November 2017. For 14 participants, there were difficulties in contacting them since their contact data had changed or were incorrect. Therefore, the period of five months for the follow-up measure could not be ensured for these participants, resulting in a follow-up measure six to fourteen months after the first measurement.

For both samples, the questionnaire used at the follow-up was shorter than the one used at the first measurement, and included only the measure of situational expectations and depressive symptoms in order to decrease the anticipated drop-out rate due to additional strains. To give an incentive for participation, participants had the chance to win gift vouchers for a popular bookshop. The study was approved by local ethics committee (reference number 2016-04k) and has been conducted in accordance with ethical standards as laid down in the 1964 Declaration of Helsinki and its later amendments. All participants gave written informed consent and all procedures were in accordance with the ethical guidelines of the German Psychological Society.

Measures

Situation-Specific Dysfunctional Expectations (SDEs)

We used the Depressive Expectations Scale (DES) to assess situation-specific dysfunctional expectations. The DES is a 25-item scale that was developed by Kube et al. (2017) to measure MDD-specific expectations. The construction principle was, according to the method of domain sampling (Nunnally, 1978), to use common dysfunctional core beliefs (e.g., “I am not likable”) to deduce situation-specific predictions thereof (e.g., “When I try to make new acquaintances, I will get to know kind people” (inverted)). The majority of the items are formulated in such a way that at the beginning of each sentence a certain everyday situation is presented, and the participants’ task is to indicate what behavioral, emotional, or cognitive consequences they expect to occur in this situation (see some examples in Appendix 1). Specifically, participants are asked to assess on a five-point Likert scale to what extent each of the possible completions would apply to them personally. Importantly, the completions can refer to both the likelihood of occurrence of a particular event or its emotional consequences; the main purpose of item development was simply to formulate a specific prediction that could be tested in a behavioral experiment. Since depression has been linked to both lack of positive expectations (Horwitz et al., 2017) and overly negative expectations (Strunk et al., 2006), it was important for us to balance positively and negatively worded items.

Originally, 75 items had been developed, and item reduction was performed in an online survey (N = 175), as described in detail in Kube et al. (2017). It resulted in a 25-item version of the DES, and a factor analysis revealed four factors: expectations of social rejection, social support, personal performance, and negative mood regulation. High sum scores of the DES reflect a greater endorsement of dysfunctional expectations. In three previous studies, the DES has shown good psychometric properties (Kube et al., 2017, 2018a, 2018b). Specifically, internal consistency ranged in previous studies between α = .87 and α = .93; one-year retest reliability was r = 0.430; correlations with measures of depressive symptoms were high (correlation with the PHQ 9: r = .754, correlation with the BDI-II: r = .572 and r = .527, respectively). In the current study, internal consistency for the clinical sample was α = .89 at the first measurement (for the healthy sample: α = .89) and α = .92 at follow-up (for the healthy sample: α = .94). Five-months retest reliability was r = .509 for the clinical sample, and for the healthy sample r = .693. After a previous study examined the factorial structure of the DES using a convenience sample (Kube et al., 2017), we performed an exploratory factor analysis to analyze the factor structure using the clinical sample from the present study. The results of this factor analysis revealed in general a similar factor structure as in the previous study, with the exception that an additional fifth factor was found, labelled ‘approval by others’. The methods, results, and discussion of this factor analysis can be found in the supplementary materials.

Dispositional Optimism

We assessed dispositional optimism with the German version of the Life Orientation Test Revised (LOT-R), originally developed by (Scheier et al., 1994) and translated into German by Glaesmer et al. (2012). The LOT-R is a 10-item self-report scale, of which four items are distractor items and excluded when computing the sum scores. The items are rated on a five-point Likert scale. High values indicate positive outcome expectations. The LOT-R has been shown to have good reliability and validity (Glaesmer et al., 2012; Reilley, Geers, Lindsay, Deronde, & Dember, 2005; Scheier et al., 1994). For the clinical sample from the present study, internal consistency of the LOT-R was α = .80, and for the healthy sample it was α = .73.

Generalized Expectancies for Negative Mood Regulation

We used the Generalized Expectancies for Negative Mood Regulation (NMR) Scale (Backenstrass et al., 2006; Catanzaro & Mearns, 1990) to examine incremental validity of the DES over this existing measure, since the NMR scale also assesses one specific aspect of MDD-specific expectations (i.e. generalized expectancies for negative mood regulation). The NMR scale includes 30 items, and is rated using a five-point Likert scale. High values reflect positive expectations. The NMR scale has been shown to be associated with depressive symptoms, and there is evidence for good reliability of this scale (Backenstrass et al., 2006). In the current study, internal consistency for the clinical sample was α = .90 (for the healthy sample: α = .89).

Intermediate Beliefs

Intermediate beliefs were assessed using a shortened version of the Dysfunctional Attitudes Scale (DAS), originally developed by Weissman and Beck (1978) and translated into German by Hautzinger, Joormann, and Keller (2005). The 26-item version of this scale is based on those items which have consistently been shown to belong to the dimensions "performance evaluation" and "approval by others" (Cane, Olinger, Gotlib, & Kuiper, 1986; Joormann, 2004; Prenoveau et al., 2009). Previous studies have revealed good reliability and validity of the DAS (Joormann, 2004; Nelson, Stern, & Cicchetti, 1992). Internal consistency for the clinical sample was α = .92 (for the healthy sample: α = .88).

Depressive Symptoms

We assessed depressive symptoms with the Beck Depression Inventory-II (Beck, Steer, Ball, & Ranieri, 1996). This well-established 21-item scale assesses somatic, cognitive and affective symptoms of depression (ranging from 0 to 63) with higher scores reflecting more severe symptoms of depression. The BDI-II has shown good psychometric properties (Beck et al., 1996).

Sociodemographic Variables

Socio-demographic variables were assessed in a self-report questionnaire including age, sex, education, and employment status.

Statistical Analyses

Data screening was conducted according to the recommendations by Tabachnick and Fidell (2014). For four participants from the clinical sample, more than 40% of all data were missing. According to Tabachnick and Fidell (2014), these participants were excluded. Univariate outliers were inspected via standardized values of measured variables and their histograms (Kline, 2005). According to Cohen, Cohen, West, and Aiken (2003) and Stevens (2002), multivariate outliers were examined via Mahalanobis distance and Cook's distance. Data from the participants who completed the follow-up questionnaire (52 participants from the clinical sample and 47 participants from the healthy sample) were used to perform a multiple linear hierarchical regression for the two samples, separately, according to the suggestions made by Tabachnick and Fidell (2014). The MCAR test (Little, 1988) yielded non-significant results in the respective samples, indicating that the values were missing completely at random. Missing values were estimated using the expectation maximization procedure according to Tabachnick and Fidell (2014). A multivariate analysis of variance (MANOVA) examined differences between the healthy and the clinical sample.

Assumptions of multiple hierarchical linear regression analysis were carefully examined. Regression analysis was performed with the BDI-II sum scores at follow-up as dependent variables. Baseline BDI-II sum scores were included as predictors in the first block. LOT-R sum scores, NMR sum scores, and DAS sum scores from the first measurement were entered as predictors in the second block. Baseline DES sum scores were entered in the third block. Importantly, although the aforementioned constructs - DES, LOT-R, NMR expectancies and DAS - represent dysfunctional cognitions, there was no multi-collinearity between the predictors, indicated by the variance inflation factor (all values < 10). In the results of the regression analyses, the standardized beta coefficients (β) are reported. Type-1 error levels were set at 5%. All analyses were conducted with IBM SPSS Statistics Version 25.

Results

Sample Characteristics

Healthy Sample

The mean participant sum score in the BDI-II at baseline was 10.10 (*SD* = 9.07) indicating minimum levels of depression (Beck et al., 1996). At follow-up, mean sum score in the BDI-II was 8.57 (*SD* = 10.24), indicating the absence of clinically relevant symptoms of depression. BDI-II sum scores at baseline ranged from 0 to 50, and eleven participants reported at least moderate levels of depression (BDI-II ≥ 20), of which five participants completed the follow-up questionnaire. At follow-up, BDI sum scores ranged from 0 to 46, and four participants reported a sum score ≥ 20. As will be shown below, the results of the main analysis are strongly influenced by whether or not the five participants who reported elevated levels of depression at baseline and completed the follow-up are included in the analysis.

A paired samples *t*-test indicated that depressive symptoms in the healthy sample did not significantly change from baseline to follow-up, $t(46) = 1.054$, $p = .297$, $d = 0.188$. Similarly, DES sum scores did not change from baseline ($M = 49.45$; $SD = 12.21$) to follow-up ($M = 49.06$; $SD = 15.96$), $t(46) = 0.227$, $p = .821$, $d = 0.032$. Sample characteristics regarding socio-demographic variables are presented in Table 1.

Table 1

Sociodemographic Sample Characteristics

Variable	**Clinical sample (*N* = 91)**	**Healthy sample (*N* = 80)**
Age in years, *M* (*SD*)	40.8 (13.2)	23.05 (5.32)
Sex, *n* (%)[a]		
male	28 (31.5)	20 (25.0)
female	61 (68.5)	60 (75.0)
Educational level, *n* (%)[b]		
No educational degree	1 (1.2)	0
Primary education	41 (47.7)	3 (3.8)
Secondary education	16 (18.6)	57 (71.3)
Higher education	28 (32.6)	20 (25.0)
Employment status, *n* (%)[c]		
Full-time working	15 (17.2)	16 (20.0)
Part-time working	6 (6.9)	10 (12.5)
In training	12 (13.8)	49 (61.3)
Unemployed	9 (10.3)	5 (6.3)
Disabled	14 (16.1)	0
Be off sick	24 (27.6)	0
Pensioners	5 (5.7)	0
Homemaker	2 (2.3)	0

[a]2 missing values in the clinical sample; [b]5 missing values in the clinical sample; [c]4 missing values in the clinical sample.

Clinical Sample

In our sample, 36.7% of the participants were diagnosed with a major depressive episode, 55.7% with a recurrent depressive disorder, 3.8% with a bipolar disorder, and 3.8% with a “double depression” (dysthymia plus current depressive episode). About a quarter of all participants (24.7%) had at least one comorbid mental disorder with anxiety disorders being most frequent (13.5%). The mean BDI-II sum score at baseline was 28.7 ($SD = 9.18$) indicating severe levels of depression (Beck et al., 1996). At the follow-up, the mean BDI-II score was 19.25 ($SD = 11.02$) indicating moderate levels of depression. A paired samples t-test indicated that depressive symptoms significantly decreased from baseline to follow-up, $t(50) = 5.205$, $p < .001$, $d = 0.922$, reflecting a large effect according to Cohen (1988). SDEs also significantly changed from baseline ($M = 68.71$; $SD = 13.25$) to follow-up ($M = 61.40$; $SD = 15.42$), $t(50) = 3.583$, $p = .001$, $d = 0.551$, reflecting a medium effect according to Cohen (1988). All sample characteristics regarding sociodemographic variables can be found in Table 1.

Differences Between Samples

A MANOVA indicated significant differences between the two samples (clinical vs. healthy) at baseline, $F(5, 165) = 73.315$, $p < .001$, $\eta_p^2 = .690$. Participants from the healthy sample had significantly fewer depressive symptoms, $F(1, 169) = 175.818$, $p < .001$, $\eta_p^2 = .510$, less pronounced situation-specific dysfunctional expectations, $F(1, 169) = 68.775$, $p < .001$, $\eta_p^2 = .289$, and less pronounced generalized expectancies for negative mood regulation, $F(1, 169) = 51.518$, $p < .001$, $\eta_p^2 = .234$. They were also more optimistic, $F(1, 169) = 93.246$, $p < .001$, $\eta_p^2 = .356$, and significantly younger than those from the clinical sample, $F(1, 113) = 124.846$, $p < .001$; $\eta_p^2 = .425$. Frequency analyses revealed that participants from the two samples did not differ on sex distribution, $\chi^2 = .865$, $p = .352$. However, healthy participants had significantly higher educational degrees, $\chi^2 = 59.371$, $p < .001$, and had, unlike the clinical sample, predominantly a student status, $\chi^2 = 69.446$, $p < .001$.

Main Analysis: Prediction of Depressive Symptoms

Using data from both samples, correlational analyses revealed significant inter-correlations of the scales used in this study, which can be found in Table 2.

Table 2

Correlational Analyses From the Healthy and Clinical Sample at Baseline

Sample / Variable	BDI	DES	NMR	LOT-R	DAS
Healthy sample					
BDI	-	.608**	-.550**	-.486**	.289*
DES	-	-	-.745**	-.690**	.512**
NMR	-	-	-	.685**	-.490**
LOT-R	-	-	-	-	-.371*
DAS	-	-	-	-	-

Sample / Variable	**BDI**	**DES**	**NMR**	**LOT-R**	**DAS**
Clinical sample					
BDI	-	.641**	-.520**	-.522**	.534**
DES	-	-	-.672**	-.561**	.634**
NMR	-	-	-	.497**	-.468**
LOT-R	-	-	-	-	-.535**
DAS	-	-	-	-	-

Note. BDI = Beck's Depression Inventory II; DES = Depressive Expectations Scale; NMR = Generalized Expectancies for Negative Mood Regulation Scale; LOT-R = Life Orientation Test Revised; DAS = Dysfunctional Attitudes Scale.

*p < .05. **p < .001.

Healthy Sample

For the BDI-II sum scores from the follow-up as dependent variable, the baseline levels of depression explained 10.9% of the variance, and had significant effects (β = .331; p = .023). The second set of predictors added another 14.7% of the explained variance which did not reach significance (p = .054); none of the predictors had significant effects. Including the DES sum scores as predictors in the third block added another 5.6% of the variance, which was not significant either (p = .074). The results of the regression analysis for the healthy sample can be found in Table 3.

When excluding the aforementioned five participants with elevated levels of depression, the pattern of results changed considerably. Neither BDI sum scores at baseline (ΔR^2 = .057; p = .127), nor the sum scores of the LOT-R, DAS, NMR (ΔR^2 = .011; p = .934), nor the sum scores of the DES at baseline (ΔR^2 = .001; p = .874) predicted depressive symptoms five months later. The overall explained variance was only 6.9%.

Clinical Sample

Using the BDI-II sum scores from the follow-up as dependent variables, the baseline BDI-II sum scores explained 14.9% of the variance, p = .005; β = .387. The second set of predictors added another 7.2% of the variance (p = .240). In this step, none of the predictors had significant effects. When including the DES sum scores in the third block, another 6.0% of the variance could be explained (p = .057). Though there was a trend indicating the importance of DES sum scores (β = .420; p = .057), none of the predictors in this step had significant effects. Results of the multiple hierarchical linear regression analysis are presented in Table 3.

Table 3

Prediction of Depressive Symptoms in the Healthy Sample (N = 47) and the Clinical Sample (N = 52)

	Criterion: BDI-II T2				
Samples / Predictors	**β**	R^2	R^2 *adj.*	ΔR^2	ΔF
		Model Healthy Sample			
Block 1		.109	.090	.109*	5.523*
BDI-II T1	.331*				
Block 2		.256	.185	.147	2.766
BDI-II T1	.103				
DAS T1	.051				
NMR T1	-.172				
LOT-R T1	-.281				
Block 3		.313	.229	.056	3.366
BDI-II T1	.031				
DAS T1	.026				
NMR T1	-.003				
LOT-R T1	-.089				
DES T1	.455				
		Clinical Sample			
Block 1		.149	.132	.145*	8.784*
BDI-II T1	.387*				
Block 2		.221	.155	.072	1.450
BDI-II T1	.256				
DAS T1	.182				
NMR T1	.162				
LOT-R T1	-.217				
Block 3		.281	.203	.060	3.804
BDI-II T1	.173				
DAS T1	.019				
NMR T1	.332				
LOT-R T1	-.232				
DES T1	.420				

Note. T1 = Baseline assessment; T2 = Follow-up assessment; BDI-II = Beck Depression Inventory II; DES = Depressive Expectations Scale; DAS = Dysfunctional Attitudes Scale; NMR = Generalized Expectancies for Negative Mood Regulation Scale; LOT-R = Life Orientation Test Revised.

$^*p < .05$.

Discussion

The aim of the present study was to examine situational expectations and more global cognitive vulnerabilities (i.e., dispositional optimism, generalized expectancies for negative mood regulation and intermediate beliefs) as predictors of depressive symptoms in a longitudinal design. In doing so, we aimed to provide a contribution to a further specification of the cognitive model of depression (Beck et al., 1979) by directly comparing the predictive values of negative global cognitions, which have been well studied in depression (Horwitz et al., 2017; Strunk et al., 2006), and situational expectations, which have recently received increasing attention (Rief et al., 2015). The results of the regression analyses indicate that for the healthy sample, none of the cognitive variables, whether global or situational, had significant effects on depressive symptoms five months later. There were only non-significant trends regarding the additionally explained variance when entering global cognitions (p = .054) and situational expectations (p = .074) as predictors. These trends, however, completely disappeared when excluding five participants who reported elevated levels of depression at baseline, presumably due to the thus reduced variance. In the clinical sample the effects of all cognitive variables on depressive symptoms did not reach significance either. There was merely a trend indicating the predictive value of situational expectations above global cognitions (p = .054). Thus, the present study failed to provide evidence for the significance of cognitive factors as predictors of depressive symptoms.

This is in contradiction with previous studies indicating the importance of both global (Czyz, Horwitz, & King, 2016; Horwitz et al., 2017; Strunk et al., 2006) and situational expectations (Kube et al., 2018b). Further, it is inconsistent with findings from studies examining cognitions other than expectations as predictors of depressive symptoms, such as dysfunctional attitudes (Alloy et al., 2006; Burns & Spangler, 2001; Jarrett et al., 2012). Arguably, the absence of significant findings in the present study is, at least in the clinical sample, most likely due to the low attendance rate at follow-up. Indeed, a post-hoc power analysis indicated that the power for, e.g., detecting an incrementally significant effect of situational expectations in the clinical sample was only 43%. In view of the extremely low explained variance when considering the healthy sample without participants with elevated depressive symptoms, the results of the healthy sample can best be interpreted in such a way that cognitive factors seem to have no influence whatsoever on depressive symptoms as long as there is low variability in depressive symptoms.

The non-significant results of the current study could possibly be seen as an opportunity to shift the focus away from the effects of cognitions themselves on depressive symptoms to their change in the further investigation of the cognitive model of depression. An excellent overview of directions for future research in this regard has been proposed by Lorenzo-Luaces, German, and DeRubeis (2015). In line with this notion, a series of recent studies has shown that depression is related to the absence of an optimistic bias in updating beliefs about the future (Korn et al., 2014) and inflexibility in adjusting negative interpretations after novel positive information (Everaert, Bronstein, Cannon, & Joormann, 2018). These findings are also in line with neurophysiological studies indicating that depression is associated with difficulty in processing unexpected events (“prediction errors”) (Garrett et al., 2014; Gradin et al., 2011).

Limitations

First and foremost, the results of the regression analyses have to be interpreted with caution due to the small sample sizes at follow-up. Given that the cognitive variables failed to reach significance in predicting depressive symptoms in the clinical sample, it is particularly important to further explore the trend regarding the importance of situational expectations as a predictor in future studies. Moreover, the small sample size at follow-up could account for the null findings regarding the influence of negative global cognitions on depressive symptoms. Therefore, future studies should aim to examine the predictive values of these variables using larger samples, ideally also including more sophisticated diagnostic procedures incl. the determination of interrater-reliability. Second, it has to be noted that the two samples considerably differed on sociodemographic variables. Therefore, it is difficult to draw inferences from the comparison of the samples. Third, given the three different clinical subsamples, multilevel methods could be considered a more sophisticated approach of analysis. However, according to a simulation study on sufficient sample sizes for multilevel analyses (Maas & Hox, 2005), the sample size of the present study would have been at high risk of leading to biased estimates of the second-level standard errors, which is why we refrained from it. Fourth, as the BDI-II is a self-report questionnaire for the measurement of depressive symptom severity, it might be useful in future studies to additionally use e.g. the Hamilton Depression Rating Scale (Hamilton, 1960) as an observer-rated assessment. Fifth, for some participants from the clinical sample, the follow-up interval was longer than five months, possibly resulting in additional variability among all participants regarding the prediction of depressive symptoms. Sixth, since all participants from the clinical sample received psychotherapeutic treatment between the two assessments, the prediction of depressive symptoms was possibly influenced by the effects of later treatment. Since the present study was not designed as an interventional study, it could not unravel specific mechanisms that may have impacted change in depressive symptoms.

In sum, the current study aimed to further specify the cognitive model of depression by directly comparing the influence of global cognitions and situational expectations on depressive symptoms. In a healthy sample and a clinical sample, the present study found neither evidence of a significant influence of global cognitions nor of situational expectations on depressive symptoms at follow-up. Given the high drop-outs at follow-up, future studies should aim to investigate larger samples in order to examine the influence of different cognitions on depressive symptoms. Special attention might also be paid in future studies to changes in dysfunctional cognitions and their influence on symptoms, which could be analyzed using structural equation modeling.

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Supplementary Materials

The methods, results, and discussion of the exploratory factor analysis for this study are provided in the Supplementary Materials (for access, see Index of Supplementary Materials below).

Index of Supplementary Materials

Kube, T., Herzog, P., Michalak, C. M., Glombiewski, J. A., Doering, B. K., & Rief, W. (2019). *Supplementary materials to "Further specifying the cognitive model of depression: Situational expectations and global cognitions as predictors of depressive symptoms".* PsychOpen. https://doi.org/10.23668/psycharchives.2655

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Appendices

Appendix 1: Sample Items of the DES

- Expectations regarding social rejection: e.g., “When I ask someone for help, I will be rejected”
- Expectations regarding social support: e.g., “When I talk to someone about my problems, I will feel better afterwards” (inverted)
- Expectations regarding mood regulation: e.g., “When I’m feeling guilty, I will feel better when I lie down in my bed”
- Expectations regarding personal performance: e.g., “When I have to get an important task done, I will fail at it”

Appendix 2: Completer Analyses

Participants from the healthy sample who completed the entire study did not significantly differ from those healthy people who completed only the baseline assessment in baseline depressive symptoms, $F(1, 78) = 0.066$, $p = .798$; $\eta_p^2 = .001$; situational expectations, $F(1, 78) = 2.811$, $p = .098$; $\eta_p^2 = .035$; dispositional optimism, $F(1, 78) = 3.164$, $p = .079$; $\eta_p^2 = .039$; intermediate beliefs, $F(1, 78) = 0.683$, $p = .411$; $\eta_p^2 = .009$; expectancies for negative mood regulation, $F(1, 78) = 0.476$, $p = .492$;

η_p^2 = .006; age, $F(1, 78) = 0.105$, $p = .746$; η_p^2 = .001; sex, $\chi^2(1) = 2.080$, $p = .149$; education, $\chi^2(2) = 0.560$, $p = .756$; or employment status, $\chi^2(3) = 2.674$, $p = .445$.

Similarly, in the clinical sample completers did not significantly differ from non-completers in baseline depressive symptoms, $F(1, 89) = 2.384$, $p = .126$; η_p^2 = .026; situational expectations, $F(1, 89) = 0.126$, $p = .723$; η_p^2 = .001; dispositional optimism, $F(1, 89) = 0.598$, $p = .442$; η_p^2 = .007; intermediate beliefs, $F(1, 89) = 0.058$, $p = .810$; η_p^2 = .001; expectancies for negative mood regulation, $F(1, 89) = 0.050$, $p = .823$; η_p^2 = .001; age, $F(1, 89) = 3.702$, $p = .058$; η_p^2 = .040; primary diagnosis, $\chi^2(3) = 4.095$, $p = .251$; comorbid diagnosis, $\chi^2(7) = 4.195$, $p = .757$; sex, $\chi^2(1) = 1.975$, $p = .160$; education, $\chi^2(5) = 6.715$, $p = .243$; or employment status, $\chi^2(7) = 3.738$, $p = .809$.

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One Single Question Is not Sufficient to Identify Individuals With Electromagnetic Hypersensitivity

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Abstract

Background: Idiopathic Environmental Intolerance attributed to Electromagnetic Fields (IEI-EMF) is a self-reported condition where non-specific symptoms are attributed to weak non-ionizing electromagnetic fields. Despite its expanding prevalence, there is no generally accepted diagnostic procedure or definition to identify patients with this condition, thus studies usually apply only one question as inclusion criterion. The aim of our study was to demonstrate the heterogeneity of a self-reported IEI-EMF group and to identify further self-report questions that could be applied as inclusion criteria.

Method: Cross-sectional on-line survey study was carried out with 473 participants (76.3% women; age: 35.03 ± 13.24 yrs). Self-diagnosed IEI-EMF (as assessed with a yes-or-no question), frequency of EMF-related symptom and severity of the condition were assessed, as well as somatic symptom distress (Patient Health Questionnaire Somatic Symptom Severity Scale, PHQ-15).

Results: 72 (15.2%) individuals labelled themselves as IEI-EMF, however only 61% of them remained in the IEI-EMF group after the use of three inclusion criteria instead of one. 21% of the individuals labelling themselves as IEI-EMF reported neither symptoms nor any negative impact on their daily life.

Conclusion: A minimum of two questions appear to be necessary as inclusion criteria for IEI-EMF in empirical research. Instead of the widely used yes-or-no question on accepting the IEI-EMF label, occurrence of symptoms attributed to EMF on a regular basis and at least a slight negative impact on daily life are required.

Keywords

electrohypersensitivity, symptoms, assessment, Idiopathic Environmental Intolerance Attributed to Electromagnetic Fields, IEI-EMF

Highlights

- Electromagnetic hypersensitivity (IEI-EMF) is often assessed by one yes-or-no self-report question.
- This practice is inappropriate from a conceptual and methodological point of view.
- At least two questions, assessing frequency of symptoms and their impact, are needed.

According to the definition of the World Health Organization, the term Idiopathic Environmental Intolerance attributed to Electromagnetic Fields (IEI-EMF; formerly electromagnetic hypersensitivity) refers to "*symptoms that are experienced in proximity to, or during the use of, electrical equipment, and that result in varying degrees of discomfort or ill health in the individual and that an individual attributes to activation of electrical equipment*" (WHO, 2004, p. 2). Originally, IEI was defined along the following criteria: (1) an acquired disorder with multiple recurrent symptoms (2) that could be associated with diverse environmental factors tolerated by the majority of the population, and (3) cannot be explained by any other known disorder (medical or psychological) (Lessof, 1997; Staudenmayer, 2006).

Concerning IEI-EMF, however, some of the aforementioned criteria are unrealistic and practically irrelevant. First (Criterion 1), why does one want and how can one distinguish between acquired and inherited conditions in the modern era when the importance of epigenetics and environment-gene interactions is well described, and empirical findings concerning genetic factors (e.g. gene polimorphisms) behind environmental illnesses are accumulating (Berg et al., 2010; Caccamo et al., 2013; Cui et al., 2013; De Luca et al., 2015, 2014; McKeown-Eyssen et al., 2004; Schnakenberg et al., 2007)? Moreover, what is the difference between individuals with acquired and (partly) inherited IEI-EMF from a therapeutic point of view? Second (Criterion 3), although it is well documented that IEI-EMF is often accompanied by co-morbid psychiatric disorders (e.g. depression, anxiety disorder) (Frick et al., 2005; Landgrebe et al., 2008; Meg Tseng, Lin, & Cheng, 2011; Österberg, Persson, Karlson, Eek, & Ørbæk, 2007; Rubin, Cleare, & Wessely, 2008) participants with such comorbid disorder(s) are usually excluded from the investigations (Baliatsas, Van Kamp, Lebret, & Rubin, 2012a). This practice leads to excessive sample loss, and, most importantly, sampling bias. Third, as in other areas of medicine, diagnoses based on exclusionary definitions should be avoided. Finally, certain salient aspects of the condition (most importantly, chronicity; M. Witthöft, personal communication) are not included.

The prevalence of IEI-EMF shows a considerable variability (between 1.5-20%) (Eltiti et al., 2007; Hillert, Berglind, Arnetz, & Bellander, 2002; Huang, Cheng, & Guo, 2018; INFAS, 2006; Mohler et al., 2010; Schreier, Huss, & Röösli, 2006; Ulmer & Bruse, 2006).This variability could be partly explained by the lack of generally accepted medical diagnostic procedure or definition. In fact, more than half of the empirical studies on IEI-EMF applied only participants' self-report about their EMF-hypersensitivity - often assessed using a simple yes-or-no question - as inclusion criterion (Baliatsas et al., 2012b).

Because of the striking similarities between IEIs and medically unexplained symptoms or functional somatic syndromes, many authors suggest that IEIs should be managed as a sub-category of somatoform disorders, where symptoms are attributed to a specific environmental factor (Bailer, Witthöft, Paul, Bayerl, & Rist, 2005; Henningsen & Priebe, 2003; Wiesmüller, Ebel, Hornberg, Kwan, & Friel, 2003). Keeping in mind that IEI-EMF is officially often recognized as a functional impairment (Johansson, 2015), and that the WHO definition considers the existence of symptoms and a negative impact on perceived health also essential to the condition, the use of further questions should be warranted from a theoretical point of view. In addition, an overly inclusive criterion can-hinder not only the exploration of the aetiology and the treatment of IEI-EMF patients, but also raises difficulties for the integration of results gained up to the present (Baliatsas et al., 2012a).

The primary goal of the study reported here was the demonstration of heterogeneity within the category of self-reported IEI-EMF. We also attempted to identify self-report questions (items) that are necessary as inclusion criteria.

Method

Participants

A non-representative Hungarian community sample was used. Participants (*N* = 473; 76.3% women; age: 35.03 ± 13.24) were recruited through various groups in the social media that are thematically not connected to environmental intolerances. The study was approved by the research ethics board of the university. Participants received no reward for their participation; all signed an on-line informed consent form before completing the questionnaire on-line.

Questionnaires and Questions

The questions and the questionnaire were part of a larger study that investigated the connection between environment and health.

Self-diagnosis of IEI-EMF (*IEI-EMF*) was assessed with a single yes-or-no question ("*Many people experience unpleasant symptoms (e.g. headache, nausea, concentration problems, palpitation, etc.) when staying in the vicinity of electromagnetic fields (e.g. near electric devices, computers, electric power lines, or during mobile phone calls). This phenomenon is called electromagnetic hypersensitivity or electrosensitivity. Do you consider yourself to be* *electrosensitive?*") (Dömötör, Doering, & Köteles, 2016; Köteles et al., 2013; Szemerszky, Gubányi, Árvai, Dömötör, & Köteles, 2015).

Severity of the condition (*Impact*) was assessed with the following question: "*On the whole to what extent do EMF-related symptoms affect your everyday life?*" (0 = no impact at all, 1 = some impact, 2 = medium impact, 3 = high impact) (Dömötör et al., 2016; Dömötör, Szemerszky, & Köteles, 2019).

Frequency of EMF-related symptoms (*Symptoms*) was assessed with the following question: "*How often do you experience symptoms in the proximity of electric devices?*" (0 = never, 1 = it happened once, 2 = rarely, 3 = often, 4 = every time) (Dömötör et al., 2019).

The existence of somatic symptoms, regardless of their origin and assumed cause, were assessed with *Patient Health Questionnaire Somatic Symptom Severity Scale* (PHQ-15) (Kroenke, Spitzer, & Williams, 2002) which measures the prevalence and severity of 15 common symptoms in a 3-point Likert-scale from 0 ("not bothered at all") to 2 ("bothered a lot"). Higher scores refer to higher prevalence of disturbing symptoms in the past 4 weeks. Scores of 5, 10, and 15 represent cut-off points for low, medium and high somatic symptom severity, respectively (Kroenke et al., 2002). In clinical practice, PHQ-15 is often used to measure somatization tendency. The Cronbach's alpha coefficient of the scale in the present study was 0.80.

Statistical Analysis

Statistical analysis was carried out with the SPSS v20 software. According to the results of Shapiro-Wilk tests, PHQ-15 scores showed a significant deviation from normal distribution, thus non-parametric methods were used throughout the analysis. Groups with and without IEI-EMF were compared using Mann-Whitney-U-tests and chi-square tests (for gender ratio).

Results

Overall, 15.2% of the individuals (72 participants) labelled themselves as being hypersensitive to EMF (*IEI-EMF* item). Descriptive statistics and the results of group-level comparisons are presented in Table 1.

Mann-Whitney-U-tests indicated a significant difference between the self-reported IEI-EMF and non-IEI-EMF group in PHQ-15 score, frequency of IEI-EMF related symptoms, and impact of EMF-related symptoms on everyday life. The IEI-EMF group was characterized by higher values in all cases, and it approached but did not reach the PHQ-15 cut-off point for medium symptom severity. There was no significant difference between the two groups with respect to gender ratio and age.

Table 1

Descriptive Statistics of the Measured Variables (Mean ± Standard Deviation)

Variable	**IEI-EMF (*N* = 72)**	**non-IEI-EMF (*N* = 401)**	**Between-group comparison** Statistic	***p***
Age	36.0 ± 13.54	34.86 ± 13.20	M-W U = 13579.50	> .05
Gender ratio (women)	82%	75%	$\chi^2 = 1.49$	> .05
Somatic symptoms (PHQ-15)	9.17 ± 4.67	7.37 ± 4.47	M-W U = 10916.50	.001
Impact on daily life	0.74 ± 0.69	0.1 ± 0.33	M-W U = 6894.50	< .001
Frequency of symptoms	2.0 ± 1.08	0.4 ± 0.78	M-W U = 4328.50	.001

Note. IEI-EMF = Idiopathic Environmental Intolerance attributed to Electromagnetic Fields; PHQ-15 = Patient Health Questionnaire; M-W U = Mann-Whitney *U*.

If we apply another inclusion criterion, i.e., the rare (but already regular) occurrence of symptoms (*Symptoms* > 1), altogether 25.37% of the 473 participants (120 individuals) reported that they had experienced symptoms attributed to electromagnetic field exposure at least occasionally. Of these 120 individuals, however, only 47.5% (57 individuals) considered themselves electrohypersensitive, whereas 63 did not. Both groups' PHQ-15 score was below the cut-off point (IEI-EMF: 9.30 ± 4.40; non-IEI-EMF: 8.54 ± 4.84), and showed no significant difference (Mann-Whitney $U = 1586.00$, $p = .269$).

Similarly, considering a minimal impact of the condition on everyday functioning (*Impact* > 0), it turns out that 82 individuals of the 473 participants (17.34%) belong to this category. Interestingly, only 53.7% (44 individuals) diagnosed themselves as IEI-EMF, while the remaining 38 did not use this label. In both groups, the PHQ-15 score exceeds the medium cut-off point (IEI-EMF: 10.02 ± 4.65; non-IEI-EMF: 10.13 ± 4.88), but they did not differ from each other (Mann-Whitney $U = 831.50$, $p = .967$).

Taken together, only 44 of the 72 individuals (61.1%) with self-reported IEI-EMF had symptoms attributed to electromagnetic devices at least rarely and suffered from the condition at least slightly. Surprisingly, there were 15 individuals (20.8%) who had neither symptoms nor a negative impact on their everyday functioning but still considered themselves IEI-EMF. In the non-IEI-EMF group, 25 individuals (6.2%) were characterized by both criteria (for details, see Figure 1). Within those, who reported symptoms and also an impact on daily life (69 individuals), the IEI-EMF group's PHQ-15 score was slightly above the cut-off point (10.02 ± 4.65), while the non-IEI-EMF group scored a bit lower (9.76 ± 4.94). Still, the difference between the two was not significant (Mann-Whitney $U = 523.00$, $p = .735$). Finally, average PHQ-15 score of the group defined by symptoms and impact regardless of the IEI-EMF label was close to the threshold of 10 (9.93 ± 4.72).

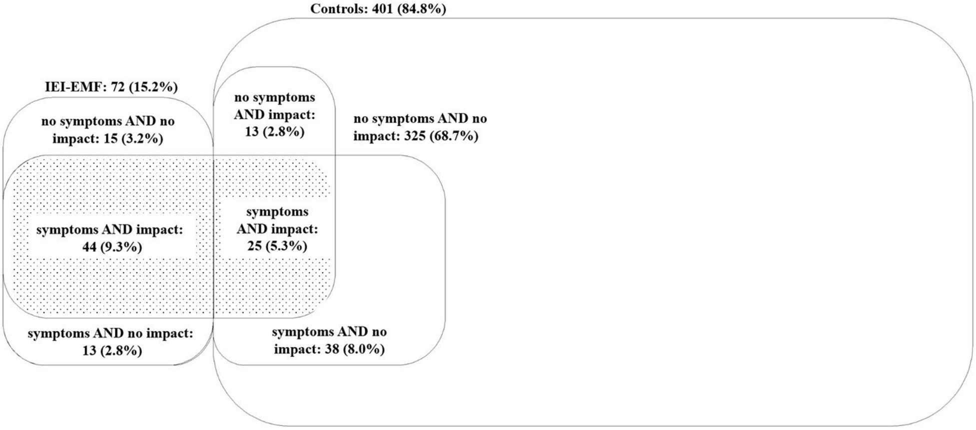

Figure 1. The number of individuals (and their percentage of total) in the IEI-EMF and control group after applying additional inclusion criteria beyond self-reported electrohypersensitivity.

Discussion

Our results demonstrate that the use of one single yes-or-no question as inclusion criterion for self-reported IEI-EMF is not an acceptable practice. Although the IEI-EMF group selected by this single question shows a higher average somatization tendency than the non-IEI-EMF group, this tendency is still under the accepted threshold of medium impact.

Beyond the widely applied yes-or-no question, the use of at least two additional questions appears to be necessary for a more precise definition of the condition and the sample. After the use of three inclusion criteria instead of one, only 61% of the individuals of the original IEI-EMF group remained there. The two additional criteria, i.e., experiencing symptoms attributed to EMF on a regular basis and symptoms impacting everyday functioning, are in accordance with the WHO definition of the condition. Moreover, this more strictly (still rather inclusively) defined group shows a score that indicates a non-negligible somatization tendency. This latter finding is in line with the conceptualization of IEI as a sub-category of functional somatic syndromes (Frick, Rehm, & Eichhammer, 2002).

In fact, self-diagnosis (i.e. the acceptance of the IEI-EMF label) is not part of the WHO definition thus the use of the yes-or-no question can be questioned. In our sample, 69 individuals of the 473 (14.6%) belong to the IEI-EMF group as defined by the symptoms and impact question. Somatization tendency of this group practically reached the threshold of medium severity, and applying the IEI-EMF label did not elevate this score substantially. In other words, using the criteria of symptoms and impact appears to be practically sufficient as well as in line with the definition of the condition.

Beyond practical issues, the present findings demonstrate that individuals with self-diagnosed IEI-EMF does not represent a homogeneous group. It is particularly striking that 21% of the individuals labelling themselves as IEI-EMF experience neither symptoms nor any negative impact on their daily life. This finding can be explained by two approaches. First, stories about harmful effects of modern technologies are abundant in mass media and impact not only people's worrying tendency (Bräscher, Raymaekers, Van den Bergh, & Witthöft, 2017; Petrie et al., 2001; Witthöft et al., 2018), but also their automatic self-perception and self-categorization. Second, as in the case of complementary and alternative medicine (Astin, 1998), philosophical congruence might be a motive for those characterized by an experiential-intuitive thinking style to accept the IEI-EMF label, even in the absence of symptoms.

The most important limitation of the present study is that our sample was not representative of the population, therefore the results are not generalizable. Additionally, the applied sampling method (online assessment) has well-known limitations. Finally, identification of people suffering from IEI-EMF based only self-report questions without any external criterion or assessment could be equivocal.

In summary, a minimum of two questions appear to be sufficient as inclusion criteria for IEI-EMF in empirical research. Instead of the widely used yes-or-no question on accepting the IEI-EMF label, regular occurence of symptoms attributed to EMF and at least a slight negative impact on daily life are required.

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Scientific Update and Overview

Symptom Perception From a Predictive Processing Perspective

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Abstract

Background: Bodily symptoms are highly prevalent in psychopathology, and in some specific disorders, such as somatic symptom disorder, they are a central feature. In general, the mechanisms underlying these symptoms are poorly understood. However, also in well-known physical diseases there seems to be a variable relationship between physiological dysfunction and self-reported symptoms challenging traditional assumptions of a biomedical disease model.

Method: Recently, a new, predictive processing conceptualization of how the brain works has been used to understand this variable relationship. According to this predictive processing view, the experience of a symptom results from an integration of both interoceptive sensations as well as from predictions about these sensations from the brain.

Results: In the present paper, we introduce the predictive processing perspective on perception (predictive coding) and action (active inference), and apply it to asthma in order to understand when and why asthma symptoms are sometimes strongly, moderately or weakly related to physiological disease parameters.

Conclusion: Our predictive processing view of symptom perception contributes to understanding under which conditions misperceptions and maladaptive action selection may arise.

Keywords

somatic symptom disorder, medically unexplained symptoms, symptom perception, predictive coding, active inference

Highlights

- There is a variable relationship between physiological dysfunction and self-reported symptoms.
- We conceptualize symptom perception (and misperception) within a predictive processing perspective.
- In this view, symptom perception integrates sensations and predictions about these sensations.
- Failures of such integration can produce misperceptions and maladaptive action selection.
- We use the perception (and misperception) of asthma symptoms as an example.

New developments in the conceptualization of how the brain works have recently emerged. These conceptualizations emphasize the predictive nature of the brain, hence are known as predictive coding or predictive processing views (Clark, 2013; Friston, 2010; Hohwy, 2013). Although the basic ideas underlying this conceptualization have been developed by von Helmholtz in the late 19th century, a strong impetus in recent years has been given by the thorough study of perception, especially of visual illusions. Many perceptual phenomena can only be understood by assuming that meaningful perception is not just a matter of processing incoming information, but that it is also largely reliant on pre-existing (prior) information: often the brain unconsciously and compellingly assumes (or infers) non-given information to construct a meaningful percept.

Predictive processing views and their implications are currently explored in an increasing number of scientific areas. In neuroscience, the theory of "predictive coding" (Friston, 2005; Rao & Ballard, 1999) describes how sensory (e.g., visual) hierarchies in the brain may combine prior knowledge and sensory evidence, by continuously exchanging top-down (predictions) and bottom-up (prediction error) signals. Besides, interest in creating intelligent systems enhanced the need to extend the predictive processing perspective beyond perceptual processing, to address also action and planning (aka active inference). Pioneering work towards this goal has been done by Karl Friston and colleagues (Friston et al., 2016; Friston, FitzGerald, Rigoli, Schwartenbeck, & Pezzulo, 2017; Friston et al., 2015; Friston, Samothrakis, & Montague, 2012; Pezzulo, Rigoli, & Friston, 2018). In the present paper, we will first introduce some basic concepts of the predictive processing view of perception (called "predictive coding") and its extension to the action domain (called "active inference"). Next, we will briefly describe their implications for symptom perception. The remainder of this paper will sketch a formal model of symptom perception as viewed from a predictive processing perspective.

Predictive Processing During Perception (Predictive Coding) and Action (Active Inference)

A basic task of the brain is to construct an adaptive model of the (external and internal) world, while its only source of information to do so is the spatial and temporal patterning of its own neural activity. In order to achieve this goal, the brain uses information from neural activity that is triggered by peripheral input (sense organs and receptors in the peripheral body), but also from neural activity that is generated by the brain itself (aka spontaneous dynamics), reflecting previous experiences and “built in” information. This leads to two counterflowing streams of neural activation across several hierarchical levels of the brain: stimulation by peripheral input (called “likelihood” in the context of Bayesian inference) interacts with activations generated by the brain that act as model-based predictions of the input (“priors”) within a specific context. For example, if one is waiting for Jeff in a crowded street, the brain generates neural patterns acting as priors that will facilitate spotting Jeff in the crowd.

The theory of "*predictive coding*" specifies how the brain may mechanistically implement this kind of Bayesian inference. According to predictive coding, input at each hierarchical level that is predicted is cancelled out (“explained away”), while unpredicted input creates prediction errors that are relayed to the next hierarchical level where it meets priors generating new prediction errors. Prediction errors are thus propagated through the brain from very basic and concrete to higher abstract levels of representation to eventually settle on a "posterior" belief (to be understood in the technical sense of a neural probability distribution, not as a conscious belief) that accounts for the stimulation with the least overall prediction errors. The posterior belief can subsequently act as prior for new input leading to further adaption in an iterative process. In the case of waiting for Jeff: the benefit of having an a priori belief in the brain representing Jeff is that it helps to quickly recognize him and to prime a network of related information for further interaction. Obviously, there is also a downside of having highly active priors about Jeff arriving soon: whenever input is downgraded to some extent, any person that resembles Jeff will easily be mistaken for Jeff. In sum, the theory of "predictive coding" postulates that the brain continuously strives to minimize its prediction error (and the difference between predictions and sensations). It does so by accommodating the prior hypothesis (or belief) and/or the model producing such hypothesis, to fit unpredicted information. For example, if Jeff was expected but a female appears, the brain can revise the prior belief. Furthermore, if Jeff is wearing a fancy new cap and sunglasses - which is discrepant information compared to previous encounters - the model of Jeff in the brain may be adapted (for example, by reducing the weight given to these aspects of visual input).

The theory of "active inference" extends this view to also account for active components of perceptual processing (active perception) and goal-directed behavior. In this perspective, the brain does not passively wait for sensory stimulations, but it can initiate activity to produce input that is consistent with its adaptive model. Waiting for Jeff may prompt the person to move towards a location providing a better overview of the passing crowd and/or to increase the scanning rate generating more detailed information to help spotting him; or even going to Jeff's house, if he does not appear. As these examples of active inference illustrate, acting is just another way to reduce prediction error. In other words, while in predictive coding one reduces prediction errors by changing the prior belief to fit the world, in active inference one reduces prediction errors by changing the world to fit the prior belief (e.g., that one will encounter Jeff). As this latter example illustrates, in active inference the prior belief is much more than a prediction: it can play the role of a cognitive goal that triggers a goal-directed plan (e.g., a plan to go to Jeff's house).

The Importance of Precision Control

Priors and prediction errors (PE’s) can be thought of as probability distributions of neural activity capturing statistical regularities associated with a specific input. These distributions are characterized by a variance, or its inverse: precision. Highly precise priors and prediction errors reflect that a neural pattern has a high probability of being associated with a particular input, and conversely for low precise priors and PE’s. If Jeff is unusually tall, both priors and PE’s representing Jeff’s height are highly precise, resulting in a quick and reliable recognition of Jeff. Repeated encounters will also generate precision expectations, that is: not only is the perceptual information related to Jeff’s “height” highly precise, the brain will learn to consider “height” as a highly precise prior for recognizing Jeff.

Precision parameters of both PE’s and priors are used as weighting factors in Bayesian inference and predictive coding: they determine the relative contributions of prior information and sensory evidence to the brain's "posterior belief" - and thus the content of perception. Highly precise priors and low precise PE’s will shift the posterior belief towards the prior, while the reverse is true with low precise priors and highly precise PE’s (see Figure 1 for a graphical illustration of integration of prior and sensory evidence in Bayesian inference). For example, when it is dark, there is a high probability to recognize Jeff in any tall person, reflecting a strong effect of the prior on the eventual perception. Conversely, on a sunny day it is less likely to take any tall person for Jeff and this likelihood is even further reduced if one is not waiting for Jeff.

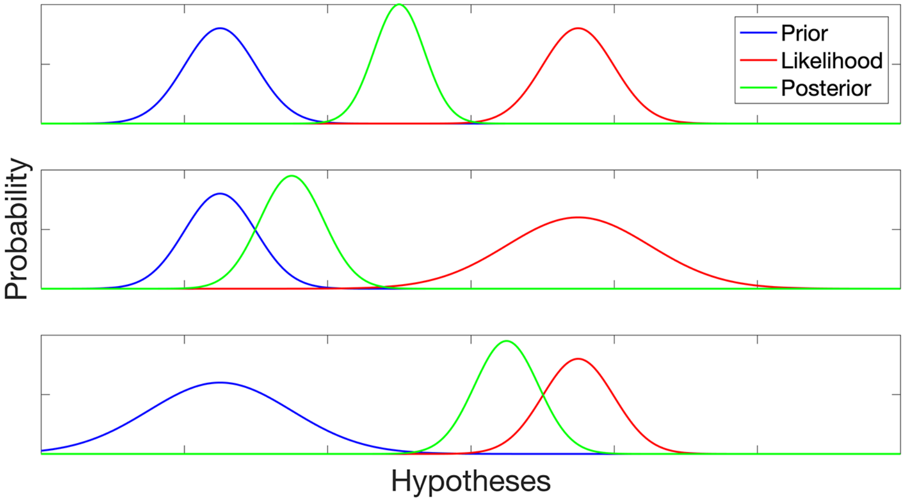

Figure 1. Integration of prior knowledge and sensory evidence (likelihood) in Bayesian inference.

Note. The top panel shows that if prior and likelihood have the same precision (i.e., inverse variance of the Gaussian distribution), the posterior belief is in between. The second and third panels show that higher precision prior and likelihood "attract" the posterior, respectively. Note that in all cases, the precision of the posterior increases compared to the prior. See the main text for explanation.

Precision parameters of sensory events play an additional role in (active) perceptual inference and information gathering. Information sources that are assumed to bring more precise information are preferentially sampled, while those that are assumed to bring imprecise information can be ignored (e.g., looking for Jeff in the total dark is useless and thus avoided).

In sum, perception can be considered a dynamic constructive process balancing external input and pre-existing information: under some conditions, the eventual percept closely reflects the external input, while in other conditions it may more closely reflect pre-existing information that act as (implicit) prior expectations. Perceptual illusions can be considered extreme cases where the percept is (almost) entirely determined by prior expectations (Pezzulo, 2014; Sterzer et al., 2018). Furthermore, perception has active (information gathering) components that permit sampling information from the most precise information sources - but can lead to inattention or even neglect when precision parameters are not set correctly (Parr & Friston, 2018).

Predictive Processing and Symptom Perception

One of the research areas for which these new conceptualizations are particularly fruitful is interoception, which is considered to play an important role in the experience of the self, agency, emotion and psychopathology (Allen, Levy, Parr, & Friston, 2019; Barca & Pezzulo, 2019; Iodice, Porciello, Bufalari, Barca, & Pezzulo, 2019; Pezzulo, Barca, & Friston, 2015; Pezzulo, Maisto, Barca, & Van den Bergh, 2019; Pezzulo, Rigoli, & Friston, 2015; Seth, 2013; Tsakiris & Preester, 2018). The Embodied Predictive Interoception Coding model (EPIC; Barrett & Simmons, 2015) describes the neural architecture and functional characteristics of interoception, suggesting a critical role for active inference: visceromotor cortices generate autonomic, hormonal and immunological predictions to adequately deal with anticipated demands while PE's are fed back to the brain to adapt and modify subsequent predictions. Because visceromotor cortices are overall relatively insensitive to somatic input, interoception is largely dominated by prior expectations ("a construction of beliefs that are kept in check by the actual state of the body", Barrett & Simmons, 2015, p. 424). Being critical for symptom perception, this account of interoception allows and suggests important variability in the relationship between symptoms and peripheral bodily dysfunction. This has tremendous conceptual and practical implications for medicine.

Indeed, while the relationship between self-reported symptoms and parameters of peripheral bodily dysfunction is generally strong in acute monosymptomatic health conditions, it becomes typically much weaker in chronic multisymptomatic conditions (Janssens, Verleden, De Peuter, Van Diest, & Van den Bergh, 2009). In a substantial number of cases no relationship with physiological dysfunction can be found at all. Hence, the latter are often called "medically unexplained symptoms" (MUS). The prevalence of MUS in primary care consultations is estimated around one third, while prevalence rates in secondary care are even higher (De Waal, Arnold, Eekhof, & van Hemert, 2004; Nimnuan, Hotopf, & Wessely, 2001). In secondary care general medicine, the symptoms often appear as functional syndromes, such as chronic fatigue, fibromyalgia, irritable bowel disease, multiple chemical sensitivity, bodily distress disorder, while in psychiatry they are labeled as somatic symptom disorder, somatization disorder, conversion disorder, etc. However, also placebo and nocebo phenomena which are abundantly present in everyday medicine are difficult to understand within a strict biomedical disease model.

The predictive processing perspective allows to describe the conditions moderating the relationship between symptoms and bodily dysfunction (Van den Bergh, Witthöft, Petersen, & Brown, 2017), to explain pseudoneurological symptoms and conversion (Edwards, Adams, Brown, Pareés, & Friston, 2012), persistent physical symptoms (Henningsen et al., 2018), placebo effects (Büchel, Geuter, Sprenger, & Eippert, 2014) and pain perception (Wiech, 2016). However, most current models appeal to the mechanisms of predictive coding, while disregarding action components (or active inference) that are equally important to understand symptoms and psychopathological conditions.

Below, we discuss a worked example of symptom perception in terms of underlying predictive coding and active inference dynamics. Our example focuses on asthma perception. Asthma relies on a well-known physiological dysfunction but often the symptoms do not clearly relate to that dysfunction, which is a rather prevalent clinical problem (De Peuter et al., 2005; Janssens et al., 2009). Our example describes the conditions for a strong, weak or absent relationship between symptoms and bodily input.

A Worked Example of Symptoms and the Body: The Case of Asthma Perception

Consider the simplified case of an asthmatic person who feels two bodily sensations (e.g., wheezing, breathlessness) that sometimes indicate the beginning of an asthma episode. The person has to infer whether it is an asthma episode (Hypothesis 1) or not (Hypothesis 2), based on what he currently feels (e.g., wheezing, breathlessness) and his prior belief (e.g., the fact that he/she is in the bedroom where he usually has asthma episodes).

Generative Model and Inference

From the formal perspective of predictive coding (and more broadly, Bayesian inference), the brain makes this inference using a so-called "generative model" of how its sensations are generated. The "generative model" has two essential components. The first one ("likelihood model") describes the probabilistic mapping between sensations (e.g., wheezing, breathlessness) and the two competing hypotheses (Hypothesis 1: this is an asthma episode; Hypothesis 2: this is not) - which in this context are also called "hidden" states, because they cannot be directly observed but need to be inferred. For example, a good likelihood model of asthma may represent the fact that under Hypothesis 1 (this is an asthma episode), the probability of feeling wheezing is high (e.g., 0.8). However, under Hypothesis 2 (this is not an asthma episode), the probability of feeling wheezing is very low (e.g., 0.05). In other words, the person should expect to feel wheezing (only) if he is experiencing an asthma episode. Furthermore, the likelihood model may represent the fact that breathlessness has the same probability (e.g., 0.6) under Hypotheses 1 and 2 (and more broadly, that one can feel breathless for many other reasons, such as because one has done physical exercise). A consequence of having this particular likelihood model is that while wheezing is very informative (i.e., feeling wheezing tells me with high probability that Hypothesis 1 is true; and not feeling wheezing tells me with high probability that Hypothesis 2 is true), breathlessness is not, as it cannot disambiguate between Hypotheses 1 and 2.

The second component of the generative model is the person's "prior belief" about the two Hypotheses 1 and 2. For example, if the asthmatic person is in the bedroom where he frequently experienced asthma episodes in the past, he may have a high prior belief (e.g., 0.7) for Hypothesis 1. If we assume for simplicity that Hypotheses 1 and 2 are mutually exclusive, and there are no alternative hypotheses, then the prior probability of Hypothesis 2 is just one minus the prior probability of Hypothesis 1; that it, 0.3.

We can use these figures to calculate the (posterior) probability of the two (mutually exclusive) Hypotheses 1 and 2, according to Bayes' rule:

$$\text{Posterior of HYP1} = \frac{\text{prior of HYP1} * \text{likelihood of HYP1}}{\text{prior of HYP1} * \text{likelihood of HYP1} + \text{prior of HYP2} * \text{likelihood of HYP2}}$$

$$\text{Posterior of HYP2} = 1 - \text{Posterior of HYP1}$$

Imagine the person is currently experiencing wheezing and is in the bedroom where he frequently experiences asthma episodes. We can use the numbers above to calculate the posterior probability (or belief) about Hypotheses 1 and 2, as follows:

$$\text{Posterior of HYP1} = \frac{0.7 * 0.8}{0.7 * 0.8 + 0.3 * 0.05} = 0.9739$$

Therefore, in this example, the posterior probability of HYP1 is 0.9739 and the posterior probability of HYP2 is one minus 0.9739, that is, 0.026. This means that in this situation, the person would have a very strong belief (in probabilistic terms) about an asthma episode.

It is possible to use the same formula to simulate other possible situations. Imagine that the same person is in the same room but does not feel any wheezing or breathlessness. In this second example, the belief about an asthma episode would be much smaller (0.474 for HYP1) - and the person should conclude that Hypothesis 2 is correct.

From Bayes' Rule to Predictive Coding

Note that we have illustrated our two examples in terms of Bayesian inference, which cannot be directly computed by the brain. However, the theory of predictive coding suggests that the brain solves something analogous to the above Bayes' formula, using a hierarchical neural architecture[1]. In this architecture, *predictions* (derived from prior beliefs) are propagated in a top-down manner, and they are compared with perceptual and interoceptive evidence (via the likelihood model). The result of the comparison is called *prediction error*, and is propagated bottom-up in the hierarchy, to help updating the (posterior) probability of the initial hypothesis.

In our first example above, the brain would propagate a strong top-down prediction about an asthma episode (as the prior of Hypothesis 1 is high); and because the interoceptive evidence (wheezing) is largely compatible with this hypothesis, the resulting prediction error that is propagated bottom-up would be relatively low. Iterating this top-

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[1] Note that predictive coding uses continuous probability distributions (e.g., Gaussian) rather than the discrete distribution that we considered in the example of Bayes' rule. For simplicity, we ignore this difference here.

down (prediction) and bottom-up (prediction error) message passing would permit refining the initial hypotheses, setting the posterior probability of HYP1 to a value where prediction error is minimized - which in this case is (close to) 0.9739.

In our second example above, the brain would propagate a strong prediction about an asthma episode, too. However, because the interoceptive evidence (not wheezing) is incompatible with this hypothesis, the resulting prediction error would be very high - and after some iterations, the inference would settle to a (posterior) probability of 0.474 for HYP1.

Precision Weighting and Its Mis-Regulation in Psychopathology

Yet there is another aspect of Bayesian inference and predictive coding that we have ignored for now but is central to theories of psychopathologies. All the aforementioned top-down and bottom-up signals are weighted by their precision. Technically, precision is the inverse variance of a probability distribution (e.g., a continuous distribution, such as a Gaussian) and it can be used as a weight to each of the elements (priors and likelihoods) of the above Bayes' rule - with the effect that the more precise information has a stronger effect on the computations of the posterior probability, see Figure 1. Precision weighting is a convenient way to give more credit to the most reliable information sources and discard noisy evidence. For example, there may be conditions in which I cannot be sure about my sensory or interoceptive evidence (e.g., I don't know how I feel); in these cases, the evidence has to be down-weighted and thus the prior dominates the inference.

Trusting the prior is of course something sensible to do when evidence is scarce or unreliable. However, there are other and more pathological cases in which the prior may acquire a very high precision and dominate the inference, even if this is not optimal; and this may constitute a route to MUS. Let's expand our second example above (i.e., the case when one has a strong prior but no evidence for an asthma episode) by also considering that both the prior and the likelihood are weighted according to some precision value. If the precision of the prior is (for some reason) excessively high, one can obtain posterior probabilities for HYP1 that are much higher than our previous example (i.e., very close to prior probabilities, as in the central panel of Figure 1). The person would thus conclude incorrectly that he/she is experiencing an asthma episode. Furthermore, given that the predictive coding architecture continuously generates predictions about what it expects, the same person may also predict or "hallucinate" the wheezing that he is not experiencing (because it is highly compatible with the winning Hypothesis 1).

This example illustrates that priors that have acquired an excessively high precision may dominate the inference and fail to be correctly updated based on empirical evidence - thus potentially producing MUS. How can priors acquire unwarrantedly high precision? While accurate predictive coding requires the precision of top-down and bottom-up signals to be optimized (and would thus not produce MUS), there may be various pathological conditions that can lead to their mis-regulation. These may include deficits of neuromodulators like dopamine and noradrenaline, which in predictive coding are carriers of precision signals; or the exposure to the "wrong" environmental statistics, like when growing up with a chronically ill or health-anxious parent. These and other condition may lead to the formation of excessively precise priors that resist updating; and it is under these conditions that MUS may emerge.

A second possible way MUS (or similar phenomena) may emerge is the converse of the above example; and namely, when likelihoods have excessively (pathologically) low precision. Some pathologies may be related to deficits of interoceptive processing, in which one "does not know how he/she feels" (e.g. alexithymia, affective agnosia; Lane, Weihs, Herring, Hishaw, & Smith, 2015) or cannot easily attribute some interoceptive sensation (e.g., wheezing) to some cause (e.g., an asthma episode). In these cases, because the interoceptive signals are assigned a vanishingly small precision, they would be largely ignored during the inference - and again, the prior would dominate it.

From Predictive Coding to Active Inference

We discussed how, under a predictive coding scheme, deficits of precision weighting in either the prior or the likelihood (or both) can lead to maladaptive perceptual inference and MUS. The theory of active inference expands this view, by introducing additional ways these deficits may hinder correct inference and action selection. Here we focus on just one aspect of active inference: the fact that it induces an active sampling of information that is expected to have informative value, i.e., to gather relevant evidence.

When describing the asthmatic person's generative model, we have considered that wheezing is more informative than breathlessness, as the presence or absence of the former (but not the latter) disambiguates between Hypotheses 1 and 2. Active inference assumes that informative evidence is not passively gathered (as in predictive coding) but actively sampled; for example, by monitoring or directing attention to the relevant information sources (e.g., "attention to bodily signals"). Active inference would thus predict that under normal conditions, the asthmatic person should preferentially monitor and direct attention to its most informative signal: wheezing.

Yet, one can imagine a degenerate (technically, high-entropy) likelihood function, in which wheezing as a source of interoceptive evidence has degraded to a sensation that has exactly the same probability under both Hypotheses 1 and 2. In this case, monitoring wheezing would be useless, as it would bring exactly the same evidence for the two hypotheses. If a person's (likelihood) model of his bodily signals were degenerate, not only he would fail to recognize asthma symptoms, but he would also cease to attend to them - and more broadly, to pay attention to his bodily signals, similar to a form of "neglect" (Parr & Friston, 2018). In this case, he would only be able to infer asthma from the prior belief or other, non-bodily sources of information (e.g., what the others around me believe about my asthma) that may not be particularly reliable. Ignoring bodily signals would thus render this person prone to MUS, as well as to deficits of body schema and self-representations that may have a strong bodily basis (Pezzulo, 2014; Seth, 2013).

A degenerate (likelihood) model of bodily signals may arise from neurological or peripheral disorders that make bodily signals noisier. However, it can also be the consequence of a poor learning and developmental processes, which can lead to the acquisition of internal models that are insufficiently differentiated and do not permit to appropriately categorize one's own interoceptive signals (Petersen, Schroijen, Mölders, Zenker, & Van den Bergh, 2014).

Conclusions

We discussed symptom perception and MUS from the perspective of predictive coding and active inference. Our examples illustrate the fact that there are various ways by which the components of a person's generative model (prior and likelihood) can be assigned too high or too low precision or become "unbalanced". This, in turn, may produce (momentary) incorrect inference or action selection or (more chronic) psychopathological conditions.

Formal theories like predictive coding and active inference can help dissecting these possibilities and identifying their markers during development. However, these conceptual models also imply important challenges to test and validate them. One way is to flesh out a computational version of the model involving a clear mechanistic description of the critical variables and their interactions, to run simulations and compare the results with evidence from real life (Friston et al., 2017; Petzschner, Weber, Gard, & Stephan, 2017; Stephan et al., 2016).

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Latest Developments

Cultural Adaptation of Scalable Psychological Interventions: A New Conceptual Framework

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Abstract

Background: The worldwide mental health treatment gap calls for scaling-up psychological interventions, which requires effective implementation in diverse cultural settings. Evidence from the field of global mental health and cultural clinical psychology indicates cultural variation in how symptoms of common mental disorders are expressed, and how culturally diverse groups explain the emergence of such symptoms. An increasing number of studies have examined to what extent cultural adaptation enhances the acceptability and effectiveness of psychological interventions among culturally diverse groups. To date, this evidence is inconclusive, and there is a lack of studies that dismantle the multiple types of modifications involved in cultural adaptation.

Method: Based on empirical evidence from ethnopsychological studies, cultural adaptation research, and psychotherapy research, the present paper offers a new conceptual framework for cultural adaptation that lays the groundwork for future empirical research.

Results: The cultural adaptation framework encompasses three elements: i) cultural concepts of distress; ii) treatment components; and iii) treatment delivery. These three elements have been discussed in literature but rarely tested in methodologically rigorous studies. Innovative research designs are needed to empirically test the relevance of these adaptation elements, to better understand the substantial modifications that enhance acceptability and effectiveness of psychological interventions.

Conclusion: Using a theory-driven approach and innovative experimental designs, research on cultural adaptation has the potential not only to make psychological treatments more accessible for culturally adverse groups, but also to further advance empirical research on the basic question about the "key ingredients" of psychotherapy.

Keywords

cultural adaptation, psychological interventions, culturally diverse groups, migrant populations

Highlights

- The phenomenology of common mental disorders, as well as mind-body concepts, vary across cultures.
- Cultural adaptation may enhance the acceptability and effectiveness of psychological interventions.
- There is a lack of empirical evidence on the substantial modifications in cultural adaptation.
- Theory-driven, experimental approaches are needed in cultural adaptation research.

On 10 October 2017, Mental Health Europe celebrated World Mental Health Day in the European Parliament. Participants in this conference discussed the urgent need to support the mental health of refugees, migrants and asylum seekers (Mental Health Europe, 2017). According to United Nations, 180’000 migrants arrived in Europe in 2017, and 134’000 in 2018 (UN Dispatch, 2018). Prevalence rates of common mental disorders such as depression, anxiety, and post-traumatic stress disorder (PTSD) are high among immigrants in Europe, and particularly among survivors of armed conflicts (Bogic, Njoku, & Priebe, 2015; Priebe, Giacco, & El-Nagib, 2016).

Worldwide, there is a large mental health treatment gap, i.e. a high number of people in need of treatment who have not received adequate treatment. The treatment gap for common mental disorders is around 60% in high-income countries, 65% in upper-middle income countries, and over 80% in lower-middle income countries (Alonso et al., 2018; Thornicroft et al., 2017). Although the treatment gap is lower in high-income countries, there are specific barriers to mental health care for culturally diverse groups, which include poor command of the host country language, cultural beliefs about mental health, lack of trust in mental health services, and mental health related stigma (Priebe et al., 2016). The Lancet Commission on Global Mental Health and Sustainable Development (Patel et al., 2018) calls for action to scale up mental health services as an essential component of universal health coverage.

In response to the worldwide treatment gap, WHO and other research groups have invested in developing a series of potentially scalable psychological interventions (WHO, 2017). Scalability is defined as “The ability of a health intervention shown to be efficacious on a small scale and or under controlled conditions to be expanded under real world conditions to reach a greater proportion of the eligible population, while retaining effectiveness” (Milat, King, Bauman, & Redman, 2013, p. 289).

One particular question for scaling-up concerns the extent to which results from one cultural group can be transferred to another. Ethnic minorities are generally underrepresented in clinical trials in high-income countries (Hussain-Gambles, Atkin, & Leese, 2004; La Roche & Christopher, 2008; Wendler et al., 2005). There is an ongoing debate in literature on the extent to which psychological interventions developed in Western, Educated, Industrialized, Rich, and Democratic (WEIRD) societies (Henrich, Heine, & Norenzayan, 2010) require cultural adaptation to be effective for the treatment of common mental disorders among culturally diverse groups. Literature indicates cultural variety in how symptoms of common mental disorders are expressed (Haroz et al., 2017; Kohrt et al., 2014), and how different cultural groups explain the emergence of such symptoms, thereby revealing their (implicit) assumptions about mind-body relationships, and religious or spiritual beliefs (e.g., Kohrt & Hruschka, 2010).

Despite such cultural variance in symptoms and assumed causes, meta-analytic evidence suggests that evidence-based psychological interventions are effective for the treatment of common mental disorders among culturally diverse groups (Cuijpers, Karyotaki, Reijnders, Purgato, & Barbui, 2018; Singla et al., 2017). But to what extent cultural adaptation can further enhance the acceptability and effectiveness of such interventions is subject to current debate in literature.

Cultural Adaptation of Psychological Interventions

Bernal, Jiménez-Chafey, and Domenech Rodríguez (2009) define cultural adaptation as “the systematic modification of an evidence-based treatment (EBT) or intervention protocol to consider language, culture, and context in such a way, that it is compatible with the client’s cultural patterns, meanings, and values” (p. 362). Cultural adaptation can range from relatively low investment of resources (e.g., adaptation of illustrations or case examples) to adaptations which require a large amount of time and human resources, e.g. adaptation to cultural concepts of distress (Kohrt et al., 2014).

Bernal and colleagues (Bernal, Bonilla, & Bellido, 1995; Bernal & Sáez-Santiago, 2006) developed a framework for cultural adaptation of psychological interventions which encompasses eight elements: (a) language, (b) therapeutic relationship, (c) metaphors, (d) content of intervention, (e) concept of illness, (f) treatment goals, (g) delivering methods, and (h) context. Meta-analytic evidence suggests that culturally adapted psychological interventions are effective when compared to a variety of control conditions ($d = 0.45$) (Griner & Smith, 2006), and more effective than unadapted versions of the same intervention in direct comparison ($g = .52$) (Hall, Ibaraki, Huang, Marti, & Stice, 2016). Moreover, two meta-analyses showed that effect sizes increased with the number of implemented adaptation elements according to the Bernal framework (Harper Shehadeh, Heim, Chowdhary, Maercker, & Albanese, 2016; Smith, Domenech Rodríguez, & Bernal, 2011). However, a series of difficulties have been reported in cultural adaptation literature.

First, the framework developed by Bernal and colleagues (Bernal et al., 1995; Bernal & Sáez-Santiago, 2006) has been criticised, particularly because of its list-like format and reported difficulties with implementing the elements in real-world settings (Chu & Leino, 2017). The eight elements are not distinct but overlap, e.g. it is hard to differentiate between adaptations made in *language* or *metaphors*, which are closely intertwined. In addition, the framework was developed for face-to-face treatments, and its use for other treatment formats such as self-help interventions is limited (Harper Shehadeh et al., 2016).

Second, when looking into the original studies included in the above cited meta-analyses, it becomes evident that such studies tested a large variety of interventions such as psychoeducation, parenting programs, cognitive-behavioural therapy, interpersonal therapy, skills training, systemic therapy, problem solving, etc. The assumed mechanisms of action behind these approaches vary greatly, thus most likely not all of these interventions require the same level of cultural adaptation. What is more, most original studies and meta-analyses do not provide detailed descriptions of the cultural adaptations that were done in the original studies, with some exceptions (e.g., Abi Ramia et al., 2018).

Third, there is very little evidence to determine which cultural adaptation elements are particularly relevant for enhancing treatment acceptability and effectiveness. Benish, Quintana, and Wampold (2011) showed that cultural adaptation of the *illness myth*, i.e. the explanatory model provided to patients for their symptoms (Bhui, Rudell, & Priebe, 2006), was the sole moderator of larger effect sizes of culturally adapted psychotherapy when compared to other active treatments ($d = 0.21$). But this finding was based on weak empirical evidence.

Aside from the Bernal framework, a series of other frameworks have been published in the past decade (Domenech Rodríguez & Bernal, 2012). In an attempt to organize the variety of elements suggested in these frameworks, Chu and Leino (2017) conducted a systematic review and developed a new, data-driven cultural adaptation framework, in which they basically make a distinction between the adaptation of *core* vs. *peripheral* aspects in psychotherapy. Core components are the therapeutic ingredients that are assumed to cause symptom change, based on psychological theories, whereas peripheral components include the treatment aspects that are related to the feasibility and acceptability of the intervention (e.g., language or case examples). In their review, Chu and Leino (2017) found that all included studies had implemented peripheral adaptations, whereas 11% had *modified* and 60% had *added* core components.

The new adaptation framework by Chu and Leino (2017) is an improvement when compared to other frameworks, particularly due to the fact that it was based on original studies rather than expert opinions. Moreover, the division of treatment aspects into peripheral (i.e., engagement and methods of delivery) and core aspects provides an intriguing simplicity in comparison with other frameworks. On the other hand, this framework is based on what has been done so far and therefore cannot capture aspects that have potentially been neglected in literature. Moreover, due to its heuristic nature, it does not provide the necessary theoretical assumptions of *how* and *why* cultural adaptation might increase the acceptance and effectiveness of psychological interventions. A more theory-based framework can set the ground for empirical research to examine these questions.

When adopting such a theory-driven rather than heuristic perspective, the division between core and peripheral aspects of psychological interventions might not be as straightforward as suggested by Chu and Leino (2017). Two recent prominent systematic reviews conclude that current evidence is insufficient to explain change mechanisms in psychotherapy (Cuijpers, Cristea, et al., 2019; Lemmens, Muller, Arntz, & Huibers, 2016). It might well be that psychotherapy works through common factors, such as the therapeutic alliance, positive expectations, and a convincing treatment rationale rather than the specific techniques that are assumed to cause changes in symptoms (Cuijpers, Reijnders, & Huibers, 2019). Thus, factors classified as peripheral by Chu and Leino (2017), e.g. psychoeducation, might actually be the core ingredients of psychotherapy, as is explained more in detail below.

In a more general manner, Resnicow, Baranowski, Ahluwalia, and Braithwaite (1999) differentiate between *surface* and *deep structure* adaptations to health interventions. Surface adaptations refer to matching materials (e.g., illustrations, language), as well as channels and settings for treatment delivery to observable characteristics of the target population. By contrast, deep structure adaptations take into account how cultural, social, environmental or historical factors influence health behaviours. Such adaptations are based on assumptions of how members of a particular cultural group perceive the cause, course, and treatment of a particular illness. In other words, and as highlighted by the authors, deep structure conveys *salience*. Resnicow et al. (1999) developed their framework for health interventions in general. When applying this logic to the cultural adaptation of psychological interventions for the treatment of common mental disorders, deep structure adaptations may take into account results from ethnopsychological studies.

Theoretical and Empirical Foundations for Cultural Adaptation

Ethnopsychology uses ethnological research to examine different populations' notions of psychological concepts such as the self, emotions, and human nature (White, 1992). Ethnopsychological studies have brought forward a large body of evidence on *cultural concepts of distress* (CCD), a term that was introduced in DSM-5 to describe local mental health-related phenomena (American Psychiatric Association, 2013). CCD encompass other terms used in literature, such as *culture-bound syndromes* (American Psychiatric Association, 1994), *idioms of distress* (Nichter, 1981, 2010), *explanatory models* (Bhui & Bhugra, 2002), or *illness narratives* (Groleau, Young, & Kirmayer, 2006).

Kohrt et al. (2014) summarised evidence on CCD from different parts of the world in a systematic review. They found that more rigorous studies revealed CCD that clearly differed from Western diagnoses of common mental disorders. Such studies examine people's ways of expressing suffering, their assumptions about causes of distress and possible ways to overcome it, physiological and spiritual meanings attributed to suffering, and the distinction between universal human suffering and mental illness (e.g., Keys, Kaiser, Kohrt, Khoury, & Brewster, 2012; Kohrt & Hruschka, 2010; Shala, Morina, Salis Gross, Maercker, & Heim, 2019).

One example of adapting psychological interventions to such CCD was delivered by Hinton, Rivera, Hofmann, Barlow, and Otto (2012), who developed Culturally Adapted Cognitive Behavioural Therapy (CA-CBT) for PTSD. CA-CBT was first developed for Cambodian survivors of the Khmer Rouge. It targets the CCD of *khyâl* attacks that is based on Cambodians' assumptions about a wind-like substance that circulates in the body (Hinton, Pich, Marques, Nickerson, & Pollack, 2010). According to this assumption, an imbalance in the khyâl flow causes symptoms such as dizziness and anxiety, which are accompanied by catastrophic beliefs and trauma memories. CA-CBT is based on this particular mind-body concept, and the main treatment components are emotion exposure and emotion regulation techniques (i.e., meditation and yoga-like stretching). Thus, CA-CBT uses techniques that are not unique for Cambodians, but the *treatment rationale* provided to patients is rooted in their own explanatory model that is based on khyâl.

This example illustrates one of the basic debates in psychotherapy research, namely the question whether the effect of the treatment is rooted in the techniques themselves, or rather the rationale provided for their use (Wampold & Imel, 2015). As brought to the point by Wampold (2007) "[p]sychotherapy is not simply the vehicle for the delivery of psychological ingredients but is, rather, a highly entwined system that uses language to construct, or better said, reconstruct the client's interpretations of the world" (p. 8). In psychotherapy research, older and more recent meta-analyses come to the consistent conclusion that after decades of randomised controlled trials (RCTs), we do not know what the "key ingredients" of psychotherapy are (Ahn & Wampold, 2001; Cuijpers, Cristea, et al., 2019; Lemmens et al., 2016). "Key ingredients" are the treatment components that (are assumed to) cause the symptom change. The current state of the evidence does not allow to conclude whether symptom improvement is caused by *specific interventions* (e.g., behavioural activation or stress management techniques) or by *unspecific factors* such as the therapeutic alliance, positive outcome expectations, or providing a convincing treatment rationale (Cuijpers, Cristea, et al., 2019).

This conclusion is highly relevant for research on cultural adaptation of psychological interventions. Chu and Leino (2017) considered "psychoeducation" to be a peripheral aspect of cultural adaptation. However, explaining the purpose of a specific therapeutic technique in a particular way to make it more congruent with the patient's worldview might be much more than just a peripheral adaptation to make the intervention more acceptable. Such adaptations in language might touch on patients' implicit explanatory models, which in turn might change the underlying mechanisms of action, even if the intervention itself (e.g., a stress management technique) remains the same. Thus, one and the same adaptation might be considered as core or peripheral.

In summary, theory-driven, experimental studies are needed to better understand *whether* and *how* cultural adaptation contributes to the acceptability and effectiveness of psychological interventions. Such studies may in the longer run also contribute to better understand the active ingredients of psychotherapy itself. We aim to lay the groundwork for such studies by suggesting a new conceptual framework. The elements of our framework are based on empirical evidence from ethnopsychological studies, research on the cultural adaptation of psychological interventions, and psychotherapy research outlined above.

A New Framework for Cultural Adaptation

Our framework is based on the elements of psychological interventions that could *potentially* be adapted – regardless of whether this has been done in previous research or not. Before conducting empirical studies, it seems important to take a conceptual approach in order to include all aspects of an intervention that might contribute to symptom change.

Our cultural adaptation framework (Figure 1) consists of three main elements which are further described below. We do not formulate pre-assumptions about the components that cause symptom change. Because evidence on substantial modifications is lacking, all elements are considered to be equally relevant for empirical testing. The elements generally reflect the two dimensions suggested by Resnicow et al. (1999), i.e., surface and deep structure adaptations (see above). While Resnicow et al.'s framework was developed more generally for health interventions, we further specified potential deep structure adaptations in psychological interventions for the treatment of common mental disorders.

The elements are presented in what we consider to be a plausible sequence, starting with what may lie at the heart of cultural adaptations, namely the CCD. From CCD – i.e. explanatory models and idioms of distress – relevant treatment components can be derived, and hypotheses can be generated about treatment delivery. In the following, we describe the three main elements and the corresponding sub-elements of the new framework and provide examples from literature to underpin our assumptions. At the same time, we make suggestions on how to implement these adaptations. Our primary aim is to provide a framework as a basis for empirical testing, but the elements outlined below can also be used for adaptations in clinical practice.

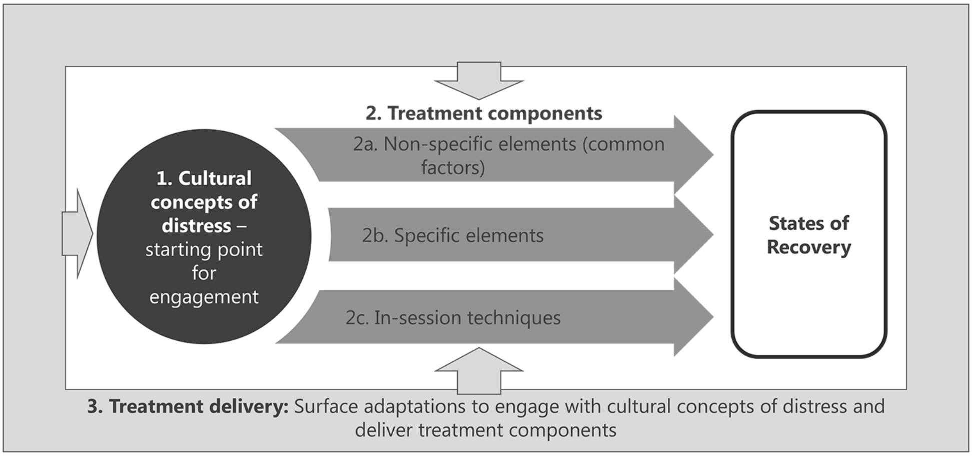

Figure 1. New framework for cultural adaptation.

Cultural Concepts of Distress

The first element of the framework focuses on core beliefs about human suffering, and the cultural resonance of hypothesized psychological mechanisms of action with ethnotheories of healing. This includes two aspects: Explanatory models (i.e., aetiological assumptions) and idioms of distress (i.e., the expression of symptoms). Several semi-structured interview guidelines have been developed to examine CCD, e.g., the *Cultural Formulation Interview* in DSM-5 (American Psychiatric Association, 2013), the *Short Explanatory Model Interview* (SEMI, Lloyd et al., 1998), *the Barts Explanatory Model Inventory* (BEMI, Rüdell, Bhui, & Priebe, 2009) or the *McGill Illness Narrative Interview* (MINI, Groleau et al., 2006). These interviews cover both aspects – idioms of distress and explanatory models – and can help to better understand patients' realities.

a. **Explanatory models.** People who suffer from psychological distress develop explanations for their symptoms (Wampold, 2007). These explanations are based on intuitive and culturally shaped notions of how mind and body interact (Kirmayer, 2001; Kirmayer & Bhugra, 2009). Above, we outlined the example of khyâl attacks among Cambodian survivors of the Khmer Rouge (Hinton et al., 2010). Other examples the concept of the *heart-mind* described in Nepal (Kohrt & Hruschka, 2010), or the heart narratives related to psychological distress in Haiti (Keys et al., 2012).

Another example are findings related to fatalism. An ethnopsychological study showed that Albanian-speaking immigrants in Switzerland understood their suffering as part of normal life, given by god or fate (*fati*), and something that cannot be cured but has to be borne with endurance (*durim*) (Shala et al., 2019). Fatalism was also found among Turkish immigrants in Germany (Franz et al., 2007; Reich, Bockel, & Mewes, 2015). When compared to German patients, Turkish immigrants showed more fatalistic-external control attributions for mental distress, which resulted in lower motivation for psychotherapy. The concept of fate is also described in Islamic understandings of suffering: “The notion of qadar (القَدَر, ‘fate’) is central to this context. This acceptance of fate should not be equated with fatalism, but can be better understood within a framework of self-abandonment, which is reflected in the value of patience in the face of helplessness and adversity, such as illness and loss. Life may be viewed as a transient phase of existence, a testing place for the eternal life that comes after death” (Hassan et al., 2015, p. 27).

Psychological interventions ideally provide explanations that differ from the patient’s own views, but that are not sufficiently discrepant from the patient’s intuitive assumptions as to be rejected (Wampold, 2007). For treatment adherence and compliance, it is vital that patients understand and to some point share the rationale behind the treatment. On the other hand, it is also important to provide a new explanation and treatment rationale, in order to motivate patients to try and practice the therapeutic techniques. As an example, Reich, Zürn, and Mewes (2019) developed a web-based intervention to address fatalism and to enhance motivation for psychotherapy among Turkish immigrants in Germany. In a pilot study, they found that this intervention enhanced treatment motivation and reduced fatalistic beliefs.

b. **Idioms of distress.** This element scrutinises the cultural salience of symptoms that are targeted with an intervention. Common mental disorders are latent (i.e., non-visible) concepts measured through the expression of symptoms (i.e., their phenomenology). There is a vast body of literature on the difference in symptom expression across cultures, e.g. with regard to emotional vs. somatic complaints (e.g., Kirmayer, 2001; Ma-Kellams, 2014; Ryder et al., 2008). Moreover, ethnopsychological studies from different parts of the world have delivered a broad range of labels used for expressing mental distress in a socially and culturally acceptable manner (e.g., Haroz et al., 2017). As an example, *thinking too much* is an expression that has been found in many parts of the world and can be used in health communication as a non-stigmatizing way to describe symptoms of psychological distress (Kaiser et al., 2015).

However, it would be erroneous to assume that such labels are simply varying expressions of the same, latent construct (e.g., depression or anxiety). Such local expressions often reflect implicit assumptions about mind-body interactions as described above. Therefore, it is relevant to carefully assess culturally salient symptoms, and to select or target treatment components accordingly.

Treatment Components

To describe treatment components, we draw on an existing taxonomy developed by Singla et al. (2017), who conducted a systematic review and meta-analysis of psychological interventions in low- and middle-income countries. They applied a multistep analysis of existing taxonomies of common psychological treatment elements and behavioural change techniques used for common mental disorders. Based on this analysis, they proposed a taxonomy of treatment components, which includes the following elements: Specific therapeutic elements (i.e., behavioural, cognitive, interpersonal, and emotional interventions); nonspecific elements to enhance engagement (e.g., empathy, empathic listening, or discussing advantages of and barriers to treatment); and in-session techniques (e.g., goal-setting, role playing, or praising). In their meta-analysis, they found that two specific techniques (i.e., interpersonal and emotional), and nonspecific elements showed the strongest association with trial effectiveness. In the following, we describe how these components may be culturally adapted.

a. **Specific elements.** Studies testing psychological interventions in low- and middle-income countries have often provided reasons for choosing one technique over another, e.g. arguing that behavioural activation is easier to explain than cognitive techniques, particularly when provided by lay helpers (Dawson et al., 2015). The selection of therapeutic techniques is ideally based on core assumptions about human suffering and healing in the target population, and culturally salient symptoms of psychological distress. As an example, behavioural activation is based on the theoretical assumption that inertia and avoidance are key mechanisms of action in depression (Ferster, 1973; Lewinsohn, 1974; Veale, 2008). However, a qualitative study conducted in Lebanon for the cultural adaptation of an internet-based intervention (Abi Ramia et al., 2018), showed that inertia and inactivity were not key symptoms of depression. Depressed people in Lebanon rather maintain their necessary activities, yet, they were described as becoming irritable, tired, sad, frustrated or angry while continuing to function. This appears to be a global phenomenon: a qualitative systematic review of depression around the world demonstrated similar findings with irritability, anger, and pain figuring prominently but, "[t]he majority of study populations did not raise problems with daily functioning as part of their subjective experiences of depression" (Haroz et al., 2017, p. 160).

   In resource-scarce settings where people can simply not afford to become inactive, and where cultural values impede social withdrawal, behavioural activation might not be the first-choice psychological intervention for the treatment of depression. In addition, the focus on improving one's mood through engaging in pleasant activities might not necessarily be a convincing treatment rationale in societies where pursuing affectively positive experiences for oneself is not a key cultural value (Schwartz, 2006).

   As another example, Tol et al. (2018) argued that for people in humanitarian settings who suffer from a broad range of symptoms related to psychological distress that cannot be easily categorized as a mental disorder (e.g., nonpathological anxiety, grief reactions, and demoralization), general stress management techniques might be more relevant than disorder-specific treatments. Stress management techniques that focus on dealing with negative emotions such as anger, sadness, or nervousness, might be more relevant in such contexts (Hinton et al., 2012; Tol et al., 2018).

b. **Nonspecific elements (common factors).** Singla et al. (2017) describe these as the elements that are either universal to all treatments, or the ones that are used for enhancing treatment engagement, such as active listening or discussing advantages and disadvantages of the treatment. With regard to elements that are universal to all treatments (e.g., active listening), the cultural adaptation may be limited to surface aspects (see below), such as how active listening is expressed verbally or non-verbally.

   When it comes to treatment engagement, providing a convincing and culturally congruent explanatory model may be relevant (see above). For discussing advantages and disadvantages of treatment, it may be relevant to consider culturally-specific notions of stigma, and the way how mental health-related stigma threatens the life domains that “matter most” (Yang, Thornicroft, Alvarado, Vega, & Link, 2014) to members of a specific cultural group (e.g., marriage, employment, social networks). Advantages and disadvantages of treatment may relate to such culture-specific notions of stigma. People affected by mental disorders could fear stigmatisation if they accept a treatment. On the other hand, patients may realise that treatment and symptom reduction can help in reducing mental health-related stigma, particularly when they are re-integrated into employment or other societal domains.

c. **In-session techniques.** Singla et al. (2017) subsume a broad range of techniques under this element, such as role-playing, goal setting, homework, or behavioural experiments. Formative research (e.g., key informant interviews or focus groups) can be used to better understand whether such techniques are acceptable in a particular target group, or how these techniques can be adapted to be accessible for members of this target group (Ramaiya, Fiorillo, Regmi, Robins, & Kohrt, 2017).

Treatment Delivery

Once the treatment components are defined, the delivery format can be selected, or different formats can be used for different target groups (e.g., face-to-face interventions for older participants and mobile applications for youths). For cultural adaptation of these elements, factors such as literacy level, socio-economic status, gender, or assumptions about the patient-therapist relationship may be taken into account.

a. **Delivery format**. This element describes cultural preferences and acceptability for different treatment modalities. As an example, several trials have tested the group-based delivery of potentially scalable interventions as opposed to individual treatment sessions (Epping-Jordan et al., 2016; Sangraula et al., 2018; Verdeli et al., 2003). Furthermore, internet-based interventions are currently propagated as one potential measure to address the worldwide mental health treatment gap, as they can widely be disseminated among difficult-to-reach populations (Schröder, Berger, Westermann, Klein, & Moritz, 2016). There is an ongoing debate about the necessity of guidance in internet-based or other self-help interventions (Baumeister, Reichler, Munzinger, & Lin, 2014). It is theoretically possible that the answer to that question is culturally relative – i.e. that for some cultural groups, guidance is more relevant than for others. Empirical evidence is needed to answer this question.

b. **Surface.** This element comes closest to what Chu and Leino (2017) considered to be peripheral aspects of psychological interventions, and what Resnicow et al. (1999) described as surface adaptations. A large variety of descriptions of such adaptations has been delivered in literature, such as using culturally adapted language and metaphors (Ramaiya et al., 2017), providing culturally relevant illustrations and case examples (Verdeli et al., 2003), or using easy-to-understand texts (Carswell et al., 2018). Evidence on such adaptations has been summarised in systematic reviews (Chowdhary et al., 2014; Harper Shehadeh et al., 2016). However, so far there is no evidence to show to what extent such adaptations are necessary to enhance acceptance and effectiveness of psychological interventions. Of course, there is a moral obligation not to use treatment materials that are potentially offensive or that may hurt religious feelings. And of course, an intervention is more likely to be accepted when patients feel that the contents are congruent with their own living situations, experiences, and cultural values. But so far, there is insufficient empirical evidence to support this assumption.

Outlook: How to Enhance Empirical Evidence on Cultural Adaptation

With this new framework, we aim to inspire a theory-driven, empirical approach to cultural adaptation of psychological interventions. A systematic review (Hall et al., 2016) provided indications that culturally adapted psychological interventions are indeed more effective than the unadapted versions of the same interventions. However, there is a lack of evidence on the *substantial modifications* that cause the higher effectiveness of adapted interventions. In most studies, several aspects were adapted at the same time, and cultural adaptation methods are rarely documented in a replicable manner. In order to advance cultural adaptation research, it would be important to formulate theory-driven hypotheses about the components that are assumed to cause the higher acceptance and effectiveness of adapted interventions, and to test these components using experimental designs.

When developing this framework, we mainly had potentially scalable interventions in mind, i.e., modified, low-intensity and highly standardised evidence-based treatments, which are applied in self-help or guided self-help format, or delivered by lay helpers

(WHO, 2017). Such interventions are condensed versions of what is done in face-to-face treatments. For such interventions, it is of vital importance to discover which components are most relevant for symptom change, and which aspects are nice-to-have. This also applies to cultural adaptation. For future research and implementation, it is crucial to better understand the treatment elements that have to be culturally adapted to make sure the intervention is acceptable and effective.

The main difference between low- and high-intensity interventions lies – as the names suggest – in the intensity of therapist involvement. In high-intensity interventions, trained therapists can (and most probably do) make "on-the-fly" adaptations whenever working individually with patients from culturally diverse groups. In low-intensity and potentially scalable interventions, most of the treatment aspects are standardised, and in unguided self-help, no contact with a therapist or lay helper is provided at all. In view of transparency and economy of treatments and trainings, it seems helpful to identify the potential cultural adaptations that can and should be made in a standardised manner to ensure that a treatment is acceptable and effective.

In contrast to previous frameworks for cultural adaptation (Bernal et al., 1995; Chu & Leino, 2017), we used cultural concepts of distress (CCD) as the pivotal point for deep structure adaptation (Resnicow et al., 1999). We suggest starting with an assessment of CCD using semi-structured interviews such as the *Cultural Formulation Interview* in DSM-5 (American Psychiatric Association, 2013) or *the Barts Explanatory Model Inventory* (BEMI, Rüdell et al., 2009), and to derive all relevant adaptations from results of such formative research. A desk literature review can help to identify studies that have already assessed CCD in the target population, to avoid duplication of work. However, we intentionally formulated our framework in a way that it does not make pre-assumptions about which adaptations are substantial. It might well be that experimental research (see below) will show that adapting psychological interventions to CCD does not make any difference with regard to their acceptability and/or effectiveness. In our view, it is essential to take this step back and to start with a conceptual framework that includes what seems to be most plausible according to current evidence. From such a conceptual framework, hypotheses can be formulated and tested in empirical studies.

Aside from a new framework, novel research approaches are needed to advance the empirical evidence on the cultural adaptation of psychological interventions. Direct comparison of adapted and unadapted versions of the same interventions are still rather the exception (Hall et al., 2016). This is understandable, as such direct comparisons require very large sample sizes, since small effects are to be expected when comparing two similar treatments with small deviations (Cuijpers, Cristea, et al., 2019). Moreover, training therapists to provide two different versions of the same intervention – adapted and unadapted – is a difficult task. Other treatment formats such as internet or mobile-based interventions, self-help books or audio recordings, are promising for such research. Such highly standardised materials, where input from therapists or lay helpers is minimal, can be used to show users two different versions of the same intervention, without large investments in training. Innovative research approaches, e.g. factorial experiments (Collins, 2018) can be used, in which several components are manipulated at the same time. Such research designs can contribute to better understand the substantial modifications in cultural adaptation.

Results from cultural adaptation may also potentially contribute to basic psychotherapy research. For a long time, there has been a debate about the specific and nonspecific components of psychotherapy, and a recent meta-analysis came to the following conclusion: “Based on this set of studies, the only conclusion that can be drawn is that we simply don’t know if specific components of specific therapies are effective ingredients of these therapies, or whether all effects are caused by universal, nonspecific factors that are common to all therapies” (Cuijpers, Cristea, et al., 2019, p. 12). Cultural adaptation research provides a promising new approach to this question. As an example, if one and the same intervention (e.g., a stress management technique) shows the same effect, regardless of the explanatory model provided to patients, this is an indicator that the specific intervention caused the symptom change. By contrast, if the same intervention shows a higher effect if it is framed in a culturally-shaped manner, this is an indicator that providing a convincing rationale is indeed a “key ingredient” of psychotherapy, as postulated by Ahn and Wampold (2001). Thus, aside from enhancing access to treatments for culturally diverse groups, cultural adaptation research can make an important contribution to psychotherapy research as a whole.

One important challenge refers to the selection of the target population for cultural adaptation. How do we define a “cultural group”? As an example, Bernal et al. (1995) developed their framework in the context of their work with “Latinos/as” in the United States, and Hinton et al. (2010) worked with “Cambodian refugees”. A cultural group can be defined in terms of language, country or region, religion, or other socio-demographic characteristics. Migration is another important aspect, as with time, immigrants start adopting cultural values and norms of the host country, which may be relevant for cultural adaptation of psychological interventions. For research purposes, it is most relevant to carefully define the target population and to be transparent about the criteria according to which this population is defined, to make sure results of studies can be interpreted accordingly. In individual therapy, semi-structured interviews can be used to tailor the interventions to the specific characteristics of the patient.

Conclusion

Considering the millions of people in need of psychological treatments worldwide (The WHO World Mental Health Survey Consortium, 2004; Turrini et al., 2017), the limited resources available for mental health (Patel et al., 2018), the cultural diversity in common mental disorders (Kohrt et al., 2014), and the variety of treatment components that are potentially relevant for adaptation (Bernal et al., 1995; Bernal & Sáez-Santiago, 2006; Chu

& Leino, 2017), it is vital to expand the empirical evidence as a basis for decision-making on *how much* and *where* to invest in cultural adaptation of psychological interventions.

The present paper offers a conceptual framework that lays the groundwork for such empirical research. The three elements suggested in this framework are based on empirical evidence from ethnopsychological studies, cultural adaptation research, and psychotherapy research. Innovative research designs are needed to evaluate the relevance of these elements. Using a theory-driven approach and innovative experimental designs, research on cultural adaptation has the potential not only to make psychological treatments more accessible for culturally adverse groups, but also to further advance empirical research on the basic question of the key ingredients and mechanisms of action in psychotherapy.

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Clinical Psychology in Europe

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Politics and Education

Clinical Psychology in Spain: History, Regulation and Future Challenges

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Abstract

The heterogeneity of national regulations in clinical psychology and psychological treatment across Europe requires a detailed description of every regulation to start a shared discussion. In the current paper, we describe the history, legal regulations, a specialized training program, the current status and some future challenges for clinical psychology in Spain. The evolution of clinical psychology in the Spanish National Health System (NHS) towards a health specialty regulated by law, exemplifies a balanced process of expansion, social recognition and professional settlement. Overall, the growth of clinical psychology in Spain may depend on access to leadership and management positions in the NHS that would allow a better organization of care resources to improve citizens' access to psychological treatment.

Keywords

clinical psychology, psychological treatment, training, education, national regulation, Spain

Highlights

- Spanish regulation of clinical psychology is mediated by socio-cultural and political changes that occurred in the late 70's and 80's in the country.
- Recognition as a licensed clinical psychologist is obtained through a 4-year training system as an intern resident psychologist (PIR).
- PIR is a training system of supervised internships, with increasing autonomy in various healthcare departments in the National Health System (NHS).
- Achieving independent Clinical Psychology Services within the NHS in order to organize, implement and deliver evidence-based practices is currently one of our biggest challenges in the near future.

Spanish clinical psychology welcomes the creation of the *European Association of Clinical Psychology and Psychological Treatment* (EACLIPT) and its journal *Clinical Psychology in Europe* (CPE). In its first issue, Laireiter and Weise (2019) reviewed and updated the heterogeneity of national regulations in clinical psychology and psychological treatment in Europe and invited European clinicians to start a discussion on the matter. As suggested by Van Broeck and Lietaer (2008), this heterogeneity is influenced at least by political issues, the organization of health care and educational aspects. This paper tries to contribute to the discussion with a description of the history, development and current status of clinical psychology in Spain.

A Brief History of Clinical Psychology in Spain

Spain endured a dictatorship from the end of our Civil War (1936-1939) until 1975. The subsequent democratization process ushered in a series of key events, the appreciation of which is necessary in order to understand the development of clinical psychology as a health specialty in our country. In 1978, the new democratic constitution stated in Article 43 that Spaniards should be entitled to health protection. More specifically, the constitution emphasized that public authorities should provide appropriate measures to assist people with mental health problems. In 1986, the General Health Law (Law 14/1986) developed the constitutional mandate and established the basis of a public National Health System (NHS). From the very beginning, governmental policies tried to develop the highest healthcare standards and welfare benefits for our citizens. Likewise, the key element of quality of care became the responsibility of health specialists who had to meet strict and demanding training programs (Sánchez-Reales, Prado-Abril, & Aldaz-Armendáriz, 2013).

Simultaneously, so-called *Psychiatric Reform* in 1985 brought about a significant change in psychiatric care policies in Spain: (i) the development of new mental health management structures with an extensive community network of outpatient mental health centers, (ii) the integration of care for psychiatric patients into the general health care system, and (iii) the adoption of an interdisciplinary clinical approach (Vázquez-Barquero & García, 1999). Interdisciplinary mental health teams allowed psychologists to gradually become part of mental health units in the newly created NHS. At the same time, new faculties of psychology opened in several Spanish universities (Olabarría & García, 2011). Prior to this, psychologists did not receive a specific education or bachelor's degree in psychological science. They used to graduate with a philosophy and letters degree and obtained a mention in psychology after following a certain academic trajectory. The institutionalization of psychology was then at its infancy. In the meantime, the NHS created its own training system in the early 80's mainly for medical specialties (Royal Decree [RD] 127/1984). The training of health specialists was now entrusted to the NHS rather than universities or other educational institutions. Specialized training now fell under the auspices of the NHS and regulated and exclusively controlled by central government (Olabarría & García, 2011; Sánchez-Reales et al., 2013). Specialties were to be approved by RD at the proposal of the ministries of health and education (RD 639/2014), and competence in non-specialized education was left to universities alone (Prado-Abril, Sánchez-Reales, & Aldaz-Armendáriz, 2014).

From 1986 until late into the first decade of the 21st century, Spain experienced a political process of decentralization. Nowadays, health care is provided by Autonomous Regional Governments (ARG). They manage health care plans and are the main public health care providers. Nonetheless, certain national controls are preserved to guarantee equal access to NHS services and healthcare assistance (Law 16/2003). Some ARG assumed health competences before others. These regions pioneered training programs in clinical psychology. These training programs followed the training model that was already established for medical specialties based on internship and placements. The Principality of Asturias was the first ARG to promote a clinical psychology training program in 1983 (García Solar et al., 1986). Andalusia and Castile-Leon in 1986 and Navarre in 1988 followed (Aparicio, 1990). Training was based on several supervised internships on different mental health placements in hospitals and other public health services. This was professionalizing and remunerated employment. Trainees were allowed increasing clinical autonomy and responsibilities during the three-year training.

In 1993, the first national call took place once regional trial programs were considered successful (Olabarría, 1998). Access to training was based on a national psychology test. Since then, the PIR test call (for its acronym in Spanish, test of access to specialized health training as intern resident psychologist) has taken place every year. Access is based on principles of equality, merit and ability (e.g., Ministerial Order SCB/947/2018). Later, in 1998, the title of psychologist specialized in clinical psychology (RD 2490/1998) was created and regulated after a complex process of political and professional negotiations (ANPIR, 2018). This RD regulates the health specialty in clinical psychology and establishes the *PIR system as the only way to obtain this title.* However, a transitory homologation process was established for practicing psychologists.

Currently, it is estimated that there could be up to 9,000 clinical psychologists in our country although there is no official register in Spain as yet (Duro, 2019). As for other health professionals, there are probably three psychiatrists for each clinical psychologist if we take into account that there are twice as many training posts per year for psychiatrists and their specialized education began some years before ours. Psychotherapy is not a regulated health profession. However, the Ministry of Health has launched a *National Register of Health Professionals*[1]. This will enable us to know, in the near future, the exact number of professionals in each of the regulated Health Specialties.

The process by which clinical psychology became a health specialty regulated by law (RD 2490/1998), with similar administrative, organizational and competence status as medical specialties (Law 44/2003), shows how a balanced approach of growth, social recognition and professional settlement took place in Spain over the past three decades. This was a process that also suffered socio-political, economic, and organizational constraints some of which came from professional psychology corporations (Olabarría, 1998; Olabarría & García, 2011; Sánchez-Reales et al., 2013). Therefore, the presence of clinical psychology in the NHS is intimately related to the process of democratization in Spain. Legally regulated tasks such as (clinical) assessment, diagnosis, (psychological) treatment, management and team leadership were now recognized as part of the scope of roles of clinical psychologists within the NHS. Clinical psychologists now hold full professional autonomy and clinical responsibility without interference from any other health professionals and enjoy a similar legal status to any other health specialty (Law 44/2003) such as, for example, psychiatrists or neurologists.

PIR Test Access, PIR Training System and Psychologist Specialized in Clinical Psychology

Nowadays, clinical psychology is structured in three different stages: bachelor's degree in psychology (4 years and 240 ECTS), non-academic postgraduate specialized training (PIR), and continuing education (CE) for specialists or independent practice as psychologists specialized in clinical psychology (Law 44/2003). However, other educational trajectories which can improve basic health training are currently under discussion (González-Blanch, 2015; Prado-Abril et al., 2014; Sánchez-Reales et al., 2013). Specifically, the so-called *degree-Master-PIR itinerary* is being proposed as the standard access to the PIR exam call from a Master's degree level of university education. This sequential education could be useful to support the progressive acquisition of skills and competences from lower to higher level of expertise. Similarly, it would foster a needed mutual understand-

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[1] https://www.mscbs.gob.es/profesionales/registroEstatal/home.htm

ing and collaboration between academics and clinicians. It may also promote a reduction in the gap between research and practice.

PIR posts are annually announced by the Ministry of Health (141 vacancies this 2019; Ministerial Order SCB/947/2018) and psychologists, who have finished their undergraduate education, can apply. The exam usually takes place around February every year. Those who obtain the best scores can opt for different training placements throughout the NHS and begin their PIR specialized training (Tables 1, 2) in May.

Table 1

PIR Specialized Training: Distribution and Duration of Supervised Internships Periods

Training Program	**Duration (in months)**
(P1) Community care, outpatient mental health and primary care support	12
(P2) Primary care	3
(P3) Addictions	4
(P4) Psychosocial rehabilitation and recovery	6
(P5) Acute psychiatric ward, hospitalization and emergencies	4
(P6) Clinical health psychology and liaison	6
(P7) Child and adolescent clinical psychology	6
(P8) Specific training areas	4
(P9) Free disposal	3

Note. Source: Order SAS/1620/2009, https://www.boe.es/boe/dias/2009/06/17/pdfs/BOE-A-2009-10107.pdf

Table 2

Organization and Annual Planning

<table>
<tr><td>M1</td><td>M2</td><td>M3</td><td>M4</td><td>M5</td><td>M6</td><td>M7</td><td>M8</td><td>M9</td><td>M10</td><td>M11</td><td>M12</td><td rowspan="2">R1</td></tr>
<tr><td colspan="12">(P1) Community care, outpatient mental health and primary care support</td></tr>
<tr><td>M13</td><td>M14</td><td>M15</td><td>M16</td><td>M17</td><td>M18</td><td>M19</td><td>M20</td><td>M21</td><td>M22</td><td>M23</td><td>M24</td><td rowspan="2">R2</td></tr>
<tr><td colspan="3">(P2) Primary care</td><td colspan="4">(P3) Addictions</td><td colspan="5">(P4) Psychosocial rehabilitation and recovery</td></tr>
<tr><td>M25</td><td>M26</td><td>M27</td><td>M28</td><td>M29</td><td>M30</td><td>M31</td><td>M32</td><td>M33</td><td>M34</td><td>M35</td><td>M36</td><td rowspan="2">R3</td></tr>
<tr><td>(P4 cont.)</td><td colspan="4">(P5) Ward, hospitalization, emergencies</td><td colspan="6">(P6) Clinical health psychology and liaison</td><td>(P7)</td></tr>
<tr><td>M37</td><td>M38</td><td>M39</td><td>M40</td><td>M41</td><td>M42</td><td>M43</td><td>M44</td><td>M45</td><td>M46</td><td>M47</td><td>M48</td><td rowspan="2">R4</td></tr>
<tr><td colspan="5">(P7 cont.: Child and adolescent clinical psychology)</td><td colspan="4">(P8) Specific training areas</td><td colspan="3">(P9) Free disposal</td></tr>
</table>

Note. M1, M2, etc. = Month 1, Month 2, etc.; R1, R2, etc. = 1st year Intern Resident Psychologist (PIR), 2nd year PIR, etc.; P1, P2, etc. = Training program 1, Training program 2, etc. (see Table 1); cont. = Continued. Source: Order SAS/1620/2009, https://www.boe.es/boe/dias/2009/06/17/pdfs/BOE-A-2009-10107.pdf

Training lasts 4 years. The exam consists of a psychology general knowledge test with 225 items (plus 10 reserve items) with a 4-option multiple-choice system. Testers have 5 hours to complete the exam. The test is composed of an open list of topics including all the contents of the psychology degree. However, a higher percentage of questions are taken from psychopathology, clinical and health psychology, psychological treatment, psychotherapy, psychological assessment and personality and individual differences. The final score is calculated from a formula whereby 90% of the score is obtained from the exam and 10% from the academic record.

It is a very demanding access test since there are thousands of applicants and only 189 estimated vacancies for 2020 (Source: Ministry of Health). Only one study has evaluated the characteristics of the applicants that obtain a placement (Carreras & Morilla, 2010). Using a survey completed by 61 out of the 131 intern resident psychologists that began their training in 2010, authors found that the test preparation phase involved an average of 16.11 months of full-time study, with an average 7 study hours a day and a total amount of 2,881 hours before the exam. This scenario contrasts with the number of vacancies offered at degree level by academic institutions that draws an excessive and irresponsible formative bubble that leaves a structural unemployment of 20,000 non-specialist psychologists (Sánchez-Reales et al., 2017). The need to restrict access at degree level and the development of a sustainable profession as a whole is a national controversy that exceeds the purposes of this paper, but is outlined in Sánchez-Reales et al. (2017).

Regarding the PIR specialized training, Article 21 (Law 44/2003) establishes the procedure to approve the training programs of the Health Specialties. The National Commission of the Specialty in Clinical Psychology (NCSCP) elaborated and proposed the current training program in 2009 (Tables 1, 2). Since the NCSCP is an advisory committee, the training program was then ratified by the National Council of Specialties in Health Sciences of the Ministries of Health and Education (Order SAS/1620/2009).

Consequently, after passing the PIR test and choosing one of the NHS vacancies, trainees are enrolled at a hospital teaching unit of psychiatry and clinical psychology. This teaching unit will ensure compliance with the program for 4 years. In addition, trainees sign a full-time contract of 37.5 hours a week. They become full members of staff at the health area to which they are attached. Their income is around 15,400-22,400 € before tax per year depending on different incentives (RD 1146/2006). Their clinical practice is supervised by staff clinical psychologists assuming increasing clinical responsibility and professional autonomy over the 4 years of training.

This training system fundamentally provides skills and competences to future clinical psychologists for a performance in clinical and healthcare settings. It basically provides skills and legal competence for clinical assessment, diagnosis and psychological treatment (Order SAS/1620/2009). However, as a theoretical-technical program, and in coherence with the EACLIPT Task Force proposal (2019), the training program goes further and establishes four main thematic areas: (i) co-education and training, with other specialists in health sciences (doctors, pharmacists, biologists, chemists), in bioethics and professional deontology, healthcare organization and management, health legislation, and research methods; (ii) general theoretical education in clinical psychology (e.g., clinical sessions, seminars, specific training in psychotherapy schools); (iii) clinical and healthcare contents or different internships (Table 1); and (iv) continuing care. Therefore, as part of future professional challenges, clinical psychologists are enabled for healthcare policy management and leadership of mental healthcare services. Nonetheless, most management posts are occupied nowadays by physicians and psychiatrists. The training program also promotes teaching and research and many residents complete their academic PhD during their training or shortly after finishing it.

As in other European countries, there is a close relationship between training in clinical psychology and psychotherapy, which requires a more detailed explanation. First, clinical psychology holds a broader scope than psychotherapy. Despite the progressive expansion of the integrative approach, psychotherapy continues to be a set of schools and name brands (or acronym-defined treatments) with epistemological, theoretical and technical differences sometimes irreconcilable (Paris, 2013). Instead, clinical psychology in Spain was designed from the very beginning, taking inspiration from the *Boulder Model* (1949; cited in Frank, 1984) in order to promote an atheoretical training that combined scientific knowledge with the delivery of professional service mainly from a public health care stance (Ávila Espada, 1990). Right now, we can perhaps say that PIR training is a pluralistic and free-school education system, although subject to the requirements of evidence-based practice (American Psychological Association [APA], 2006). Likewise, in licensed clinical psychologists, although they should follow clinical guidelines, integrative attitudes prevail as shown in a recent national survey (Prado-Abril et al., under review).

It is important to emphasize that training in clinical psychology lays the groundwork for a clinical psychologist to face clinical practice in Spain with a broad view (EACLIPT Task Force On "Competences of Clinical Psychologists", 2019). Future sub-specialization may be required in certain mental health settings. We are aware that our PIR training system may seem long and excessive in certain European countries. However, it has been emphasized that excellence is a goal in the NHS (Law 14/1986) and this is based on having well trained health specialists. From that viewpoint, some contents that appear in Table 1 may be better understood. The specific training areas that clinical psychologists pursue could be sub-specialized into psycho-oncology and palliative care, neuropsychology, psychogeriatrics, sexual and reproductive health, eating disorders, personality disorders or extend 4 more months in child and adolescent clinical psychology, among other options. The Free Disposal internship placement reinforces this strategy and it allows for a placement in an international mental health institution or in accredited excellence healthcare settings, while keeping their salary. The most common destinations are the United States, Argentina and the United Kingdom (UK). ANPIR society offers scholarships to the best candidates and a list of some of the centers chosen in recent years can be seen in https://www.anpir.org/becas-anpir/. Finally, continuing care is a very important part of the program since it allows a supervised continued clinical activity throughout the 4 years of training allowing a broader view of clinical practice that sometimes can be limited by short-term specific internships. Continuing care is carried out in different ways such as the performance of low and high-intensity psychological treatments in individual and/or group formats, both in outpatient mental health centers or primary care, liaison programs (in oncology, neurology…) or even, taking part in emergency guards with their psychiatry co-residents.

Conclusions and Future Challenges

In the last 26 years, clinical psychology in Spain has progressively acquired its own identity based on a solid specialized health training that also has a clear interest in contributing to the development of high-quality public health services. However, Spanish clinical psychology faces some important future challenges.

The two main future challenges are improving training and citizens' access to psychological treatments within the NHS. Concerning training, there are suggestive evidence-based proposals on how to improve supervision and a more individual-focused training (Callahan & Watkins, 2018; Prado-Abril, Gimeno-Peón, Inchausti, & Sánchez-Reales, 2019). Once training in evidence-based treatments is established, it is crucial to promote those personal and interpersonal attitudes and skills that have proven to influence the outcome of psychological treatments (Bennett-Levy, 2019; Heinonen & Nissen-Lie, 2019). The goal is to get our specialists to be flexible while remaining faithful to well-established procedures (Norcross & Wampold, 2018; Truijens, Zühlke-van Hulzen, & Vanheule, 2019) and involved in CE throughout their professional life.

The second goal is perhaps somewhat more complicated but inspired by the UK experience (Clark, 2018). Primary care-mental health interface programs and stepped care models should be implemented and developed so as to improve access to well-established psychological treatments. This would allow a better management of common mental health disorders that otherwise do not receive adequate treatment and reducing the mental disorders burden charge (Ruiz-Rodríguez et al., 2018). Catalonia has pioneered this strategy since 2006, so by 2017 all mental health programs in primary care were available for the entire Catalonian territory. The rest of the country is still far behind, but the PsicAP Project (Psicología en Atención Primaria [Psychology in Primary Care]; e.g., González-Blanch et al., 2018; Ruiz-Rodríguez et al., 2018) is gradually helping to change the mindset of health and policy managers. PsicAP is a national multicentric randomized controlled trial that pursues testing the effectiveness, cost-effectiveness and cost-utility of a transdiagnostic cognitive-behavioral group therapy versus treatment as usual with common mental health disorders in the primary care settings (Cano-Vindel et al., 2016).

Other specific challenges that derive from these two major issues listed above are now going to be summarized. In order to carry out a solid and professional mental health care project, we will not only need better trained professionals, but also a greater number of them and, consequently, more than 141 or 189 PIR vacancies per year. Similarly, developing child prevention and care requires a greater sub-specialization. The creation and regulation of a child and adolescent clinical psychology specialty is being considered at this moment (source: Ministry of Health). It will enable clinicians to offer more effective care to children and adolescents. Likewise, there is increasing interest in strengthening training in specific areas such as neuropsychology. Nevertheless, there is still a lot of reluctance in certain healthcare contexts of the NHS regarding the development and consolidation of clinical psychology, particularly in management or leadership positions. At this point, it should be outlined that the *Psychiatric Reform* was an incomplete process due to a counter-reform led by some psychiatrists that gave way, at times to authoritarian, pharmaco-centric biomedical approaches. Under these limitations, our attachment to psychiatry services does not make sense anymore. There is now an increasing demand amongst clinical psychologists to create clinical psychology services. It would allow clinical psychologists to improve service delivery, management and clinical programs based on evidence-based practices without the limitations of a biomedical model that now controls care policies in mental health in Spain, limiting access to proper psychological treatment.

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Politics and Education

The Role of Psychotherapy in the German Health Care System: Training Requirements for Psychological Psychotherapists and Child and Adolescent Psychotherapists, Legal Aspects, and Health Care Implementation

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Abstract

In Germany every citizen must acquire either public or private health insurance from companies which then cover the expenses for psychotherapeutic in-patient and out-patient treatments within a given set of regulations. Since the commencement of the Psychotherapists' Law in 1999, psychological psychotherapists and child and adolescent psychotherapists are permitted to diagnose and treat mental disorders with psychotherapy under their own responsibility as a legally defined healing profession. Psychotherapists have to use scientifically approved psychotherapeutic approaches for treatment. The qualification and licensure of psychotherapists are highly regulated by the Psychotherapists' Law, which is currently undergoing a process of change.

Keywords

German mental health care system, psychotherapists' law, qualification and licensure, psychological psychotherapists, child and adolescent psychotherapists, guidelines for psychotherapy, Federal Chamber of Psychotherapists, planning for demand

Highlights

- 2.86 million patients are in outpatient or inpatient psychotherapeutic care per year in Germany, tendency rising.
- Psychotherapeutic care is highly regulated, only scientifically approved approaches are admitted.
- Psychological and child and adolescent psychotherapists treat patients under their own responsibility.
- Future courses of study and advanced training for psychotherapists will be similarly structured to those of the medical profession.

In Germany with its 83 million inhabitants expenditures on health in 2015 totalled 343.5 billion euros, equalling 11.3% of the gross domestic product (Gesundheitsberichterstattung des Bundes, 2017). The costs caused directly by mental and behavioural disorders amounted to 44.3 billion euros (Statistisches Bundesamt, 2015). Mental health care is becoming increasingly more important.

Health insurance is provided through either public or private health insurance. Public health insurance is open to everybody, regardless of whether they are employed, self-employed, or unemployed. German citizens who are mentally or physically ill are entitled to all available treatments necessary for healing.

Mental Health Care

Mental health care in Germany is mainly provided by office-based psychotherapists, psychiatrists and eligible medical doctors, psychiatric hospitals, psychosomatic clinics and psychiatric outpatient clinics. In addition rehabilitation centres, community mental health care centres, and different types of residential facilities provide a broad spectrum of nonmedical vocational, residential, and psychosocial counselling services (Salize, Rössler, & Becker, 2007).

Sundmacher et al. (2018) calculated that 1.9 million patients per year are treated in outpatient psychotherapeutic care. Gallas, Kächele, Kraft, Kordy, and Puschner (2008) found a median therapy duration of 16 months, ranging from 13 months (cognitive behavioral therapy) to 24 months (psychoanalytic psychotherapy). Approximately a further 960,000 patients per year are treated in psychiatric and psychosomatic inpatient care. The average treatment duration for mental disorders in hospitals in 2017 was 24.2 days in total, 27.4 days for female and 21.2 days for male patients, respectively (Augurzky, Hentschker, Pilny, & Wübker, 2018), with huge differences between psychiatric (23.8 days) and psychosomatic (42.9 days) inpatient care (Statistisches Bundesamt, 2017).

Access to mental health care is basically free of (extra) charges for most people in Germany which is an uncommon feature among member states of the European Union (Strauß, 2009).

Regulations for Psychotherapists

Unlike some other European countries Clinical Psychology is not an independent profession in Germany. In 1999 the legal basis was laid for psychologists to ultimately practice independently and on their own authority. In Germany the profession of psychotherapist has been regulated by law since 1999 (Gesetz über die Berufe des Psychologischen Psychotherapeuten und des Kinder- und Jugendlichenpsychotherapeuten, PsychThG, 1999). The Psychotherapists' Law (German: Psychotherapeutengesetz, PsychThG) regulates the practice of psychotherapy as well as the qualification and licensing procedure of nonmedical professions, e.g., psychologists. In this article, we specifically focus on the legal requirements for training and licensing psychological psychotherapists and child and adolescent psychotherapists. For medical doctors there are different regulations.

The law (PsychThG, 1999) legally created two new professions, namely psychological psychotherapists and child and adolescent psychotherapists (who are allowed to treat only children and adolescents under the age of 21). In 2018 this law was undergoing a major change and will be set into place by the end of 2019. According to the new law in future there will be only one profession called psychotherapist.

The old and the new law define psychotherapy as a practice using scientifically approved psychotherapeutic approaches for the assessment, cure, or alleviation of mental disorders. This has implications for postgraduate training because the Scientific Advisory Council for Psychotherapy, which is formed in equal parts by scientific representatives of psychotherapists and specialised medical doctors, has currently only approved psychoanalysis, psychodynamic psychotherapy, cognitive behavioural therapy, and family therapy for the treatment of mental disorders. For the treatment of injuries or illnesses of the brain neuropsychological therapy is approved. Consequently, students are restricted to becoming licensed in the aforementioned approaches.

Qualification and Licensure – The Current Status

According to the "old law" currrently the qualification of psychological psychotherapists and child and adolescent psychotherapists is regulated separately for each profession (Ausbildungs- und Prüfungsverordnung für Kinder- und Jugendlichenpsychotherapeuten, KJPsychTh-APrV, 1998; Ausbildungs- und Prüfungsverordnung für Psychologische Psychotherapeuten, PsychTh-APrV, 1998). Academic social workers and educators who have obtained a master's degree complete an equivalent postgraduate training in child and adolescent psychotherapy, but the educational framework is identical to that of psychological therapists.

Overall, the qualification process has to have a minimum duration of three (full-time) or five (part-time) years of postgraduate specialist practical training in psychotherapy and certification in an approved psychotherapeutic approach. This long-term, postgraduate training for psychotherapists is unique within the European Union (Strauß & Kohl, 2009). In order to register for the state examination, psychotherapists in training need to complete four modules comprising theoretical education, practical internships, practical supervised training, and self-experience (see Table 1). In particular, students have to complete 600 hours of continuing coursework, 1,800 hours of clinical experience in an inpatient setting (a minimum of 1,200 hours in a psychiatric hospital and 600 hours in a rehabilitation hospital or in a licensed outpatient setting), 600 supervised outpatient treatment sessions of at least 6 patients (including 150 hours of accompanying supervision), and an additional 930 hours of unspecified psychotherapy-related coursework. Furthermore, self-experience plays an important role in the training of psychotherapists, as future psychotherapists are required to complete 120 hours of one-to-one or group sessions or a mixture of both settings. In practice the described demands in training can be significantly higher, i.e. for the psychoanalytic approach.

After these requirements are met, psychotherapists in training then need to pass a state examination comprising a written and an oral exam. After passing the state examination, candidates are licensed. This structured postgraduate training in psychotherapy is organised by universities and state-licensed institutes. In total, 254 postgraduate training programs were offered by 215 state-licensed educational institutes and 39 universities (unith e.V., 2018). Nearly 2,700 students took part in the written state exams in 2016, 1,900 for a license in psychological psychotherapy and around 800 for child and adolescent psychotherapy. This shows an increase of 17% of graduates compared to 2015 and an increase of 61% compared to the previous five-year period.

Qualification and Licensure in the Future

The German Psychotherapists' Law had to undergo long-overdue adjustments and an educational reform for several reasons. The first reason is that the current graduation system is not adjusted to the structure of bachelor and master degrees which was not implemented in Germany in higher education until 2013. The federal state government agencies need more precise legal specifications to be able to fulfil their statutory responsibilities (i.e. standardised admission requirements to the postgraduate training) and thus ensure a high-quality standard of postgraduate psychotherapy training nation-wide. Another area that needs significant improvement is the very low level of payment during postgraduation training. At the moment their legal employment status is not properly regulated (Wissenschaftsrat, 2018). Additionally psychotherapists in training have substantial financial expenditures. Students have to pay between 20,000 and 30,000 euros on average in tuition fees (Strauß et al., 2009). Furthermore, the development of psychotherapeutic knowledge is developing very rapidly and subsequently adaptations of the training acquirements are necessary.

Modernisation of Current Psychotherapy Training

In 2014, the German psychotherapists' meeting (German: Deutscher Psychotherapeutentag, DPT) passed a resolution, after a two-thirds vote, to campaign for a reform of the current psychotherapeutic training and a modernisation of the underlying Psychotherapists' Law (Bundespsychotherapeutenkammer, 2014).

The core idea is to adapt the structure of the (postgraduate) training program for psychotherapists to the structure of education of medical doctors. A central part of this proposal is the implementation of a consecutive bachelor's and master's (of science) degree in psychotherapy studies as a requirement for the admission to the postgraduate advanced training program. It is suggested that during this advanced training phase, psychotherapy trainees specialise in either the treatment of adults or of children and adolescents in an approved psychotherapy approach, e.g. psychodynamic, behavioural or systemic psychotherapy (Bundespsychotherapeutenkammer, 2014).

During the discussion of the role of future psychotherapists in the German health care system, the question arose of whether and to what extent traditional competences of psychotherapists should be expanded (e.g. regarding certificates for sick leave from work).

In contrast to the current system, there is a given set of regulations for the mandatory contents of basic scientific and practical psychotherapeutic knowledge in the bachelor and master courses. In addition to the master's exam, a state-controlled exam is mandatory for receiving the formal psychotherapy licence (in German: "Approbation"). This licence is the prerequisite for entering the subsequent advanced psychotherapy training. In the advanced training program psychotherapists will be employed in specialised hospitals or outpatient clinics (legally, the advanced training program will be officially regulated by the state chambers). Currently, the Federal Chamber of Psychotherapists considers a duration of 5 years (full-time employment) as necessary for the advanced training (with a minimum of 2 years in an outpatient setting and 2 years in a hospital setting). The advanced training will contain the training in an approved psychotherapy approach and either in the treatment of adults or in the treatment of children and adolescents. The official licence of treatment for psychotherapists in an own practice (that allows for remuneration by the insurance companies) will require a successful completion of advanced training.

The new law was passed by the German parliament (Bundestag) in September 2019 and approved of the parliament of the governments in the federal states (Bundesrat) in November 2019. The new educational system for psychotherapists is due to start in October 2020.

Table 1

Current and Future Structure of the Qualification and Licensure of Psychotherapists in Germany

Current Structure[a]	**Future Structure**
Course of Study	
Psychology	Psychotherapy
Graduate Degree: Bachelor’s and master's degree	Focus: scientific and practical psychotherapeutic knowledge
	Graduate Degree: Bachelor's and master's degree
Education Science	Additional state examination: licensure ("Approbation")
Graduate Degree: Bachelor's and master's degree	
Social Work	
Graduate Degree: Bachelor's and master's degree	
Training	
Postgraduate Training	Advanced Training
Status during training	
Apprentice	Employee
Duration	
Minimum 3 years full-time	Minimum 5 years full-time
Payment	
Very low level of payment	Regular salary
Components of the training	
• Internship in a psychiatric hospital (1200 hours) and in a rehabilitation hospital or in a licensed outpatient setting (600 hours) • Supervised outpatient treatment (minimum 600 sessions, at least six different patients) • Self-experience / supervision / theory	• Psychotherapist in a (psychiatric) clinic (minimum 2 years) • Outpatient treatment (minimum 2 years) • Possible: Specialiced centers (1 year) • Self-experience / supervision / theory
Specialisation	
Scientifically approved psychotherapeutic approach	Scientifically approved psychotherapeutic approach
State examination: licensure ("Approbation")	Exam (conducted by the state psychotherapist chambers)
Degree	
Psychological Psychotherapist / or / Child and Adolescent Psychotherapist	Specialiced Psychotherapist for: Children and Adolescents / or / for: Adults
Admission	
Admission to Statutary Health Insurence - Care System	Admission to Statutary Health Insurence - Care System

[a] A successfully completed consecutive master's degree in either social work or education science only allows admission to postgraduate training in child and adolescent psychotherapy. A successfully completed consecutive master's degree in psychology allows admission to postgraduate training in psychotherapy for adults as well as children and adolescents.

Professional Organisation

In Germany, state law requires psychotherapists (psychological psychotherapists, child and adolescent psychotherapists - and all future psychotherapists) to be compulsory members of a state psychotherapist chamber (Heilberufe-Kammergesetz, 2002). Its principal responsibility is the supervision of occupational standards. The state chambers, which are organised on a national level in the Federal Chamber of Psychotherapists (Bundespsychotherapeutenkammer, BPtK), therefore work as public corporations. The BPtK represents some 50,000 psychotherapists in Germany and is thus the only professional organisation to represent all psychological psychotherapists and child and adolescent psychotherapists in Germany. In 2015, two thirds of its members were working in an outpatient setting and their mean age was 52 years; one third are even 60 years or older. Seventy two percent of its members were female. This ratio is likely to shift even more in favour of female members in the next decade. Among the age group of 35 year-olds and younger, the percentage of female psychotherapists is already close to 91% (Bundespsychotherapeutenkammer, 2016).

Outpatient Psychotherapy

The Federal Joint Committee (German: Gemeinsamer Bundesausschuss, G-BA) is the highest decision-making body of the joint self-government of physicians and psychotherapists, dentists, hospitals, and health insurance funds in Germany. It specifies which services in medical care are reimbursed for more than 70 million people within the statutory health system and also specifies measures for quality assurance in outpatient areas of the health care system. The Guidelines for Psychotherapy are published by the G-BA to ensure that all patients in outpatient psychotherapy are cared for in a qualified and adequate way (Psychotherapie-Richtlinie, 2017). Nevertheless, psychotherapy is limited to specific diagnoses according to the International Classification of Diseases Chapter 5 (F) German Modification (ICD-10 GM, Dilling, Mombour, & Schmidt, 1991). Indications are adjustment-, affective-, anxiety-, compulsive-, conversion-, dissociative-, eating-, sexual-, sleep-, somatoform-, personality-, and psychotic disorders as well as behavioural and emotional disorders in children. Psychotherapy can also be approved if psychological factors are pathogenetic or impair somatic health.

Patients can choose their therapist freely from a pool of licensed psychotherapists. After consultation and possible probationary sessions, a subsequent application for psychotherapy is evaluated by an experienced psychotherapist based on a psychological report which includes anamnesis and biography, diagnosis, treatment planning, and prognosis. Approval of psychotherapy is thus based on professional opinion rather than health insurance company personnel. For outpatient treatment of mental disorders, the statutory health system covers only psychoanalysis, psychodynamic psychotherapy, and cognitive behavioural therapy. The costs of neuropsychological therapy are also covered for the treatment of injuries or illnesses of the brain. Limitations are set in terms of session quotas for each psychotherapeutic approach (e.g., for psychotherapy with adults in cognitive behavioural therapy: up to 80 individual sessions; psychodynamic therapy: up to 100 sessions; psychoanalysis: up to 300 individual sessions). As of 2018, systemic therapy has been approved by the G-BA and is in the process of becoming a psychological treatment which is eligible for reimbursement of treatment costs for adult patients (Gemeinsamer Bundesausschuss, 2018). Even though many more methods and techniques of psychological treatment have become familiar in the field of psychotherapy research today, the G-BA's approval policy remains rather conservative. Private insurance companies differ from each other in their medical service tariffs, but they are oriented towards the G-BA's Guideline for Psychotherapy.

In contrast, there are less stringent regulations for psychological interventions in psychiatric and psychosomatic hospitals and rehabilitation centres because inpatient treatment expenses are assigned to another cost unit of health insurance funds. Furthermore, in hospitals and rehabilitation centres the treatment responsibility is held by executive medical doctors. Their ability to freely chose and adequately provide treatment is guaranteed by a less narrow, i.e., less specific legal definition of medical practice in comparison to psychotherapists.

Desirable Changes to Mental Health Care Regulations

Changes need to be made in the areas of provision, planning for future demand and the educational training system for psychotherapists. Health economic analyses of the German mental health care system have shown that most of the financial resources are spent for inpatient treatment and outpatient drug prescriptions, while with approximately 2 billion euros only a small fraction of the budget is spent for outpatient psychotherapy (Jacobi et al., 2014; Kilian & Salize, 2010).

The planning for demand of psychotherapeutic outpatient practices through regulations by the G-BA is outdated. There are up to three times more psychotherapists licensed per 100,000 inhabitants in urban areas than in rural areas (Bundespsychotherapeutenkammer, 2018). Consequently, the average waiting period for outpatient psychotherapy in the social insurance health system is around four months in metropolitan areas and five to six months in rural areas (Bundespsychotherapeutenkammer, 2018). Recently the G-BA decided to change these regulations to improve the situation. Consequently, in the short term, there will be some improvement via additional psychotherapists but in the long term this new system implies a further deterioration of outpatient care of menatlly ill persons.

This discrepancy and an increasing economic burden of mental illness point to the need for further improvement (Jacobi et al., 2014; Murray & Lopez, 1996; Whiteford et al., 2013). It is expected that the effectiveness and efficiency of the German mental health care system can be significantly improved by an even further shift of resources from inpatient to outpatient care (Karow et al., 2012). A reform of the regulation system for the admission of statutory health care providers should therefore lead to quotas based on morbidity instead of location.

Consequences of the German Regulations for Research in Psychotherapy

The establishment of outpatient services within postgraduate training programs makes it easier to include patients in research projects. Most of the psychology departments in German universitites run a post-graduate program and thus have more possibilities to combine the outpatient service with research studies. But there are also some important limitations. As mentioned above the G-BA approved psychotherapeutic approaches are the basis for financing psychotherapy within the health care system. The admission to the health care system is also orientated on these traditional lines. Clinical psychology units provide professional experience and training-programs mainly for cognitive behavioural therapy and therefore there is a huge lack in possibilities for research for the other psychotherapeutic approaches. In the process of the reform the chambers and other professional organisations demand, that there should be more personnel at the universities with specific qualifications for teaching these other psychotherapeutic approaches.

Conclusion

Since the Psychotherapists' Law came into effect in 1999, the professional title "psychotherapist" has been protected by law and the training for becoming a psychotherapist is regulated on a high professional level. Every German citizen can rely on this high quality of training and subsequently expect professional treatment. Nationwide data show that more and more people with mental disorders are seeking help from psychotherapists. In consequence, the waiting period for professional treatment has become longer over the years. Despite increasing numbers of psychotherapists, even more psychotherapists for outpatient treatment are needed, particularly in rural areas. This situation is very similar in hospitals and specialized clinics for mental disorders. Consequently, evidence-based treatments following international guidelines cannot be offered to every patient due to a lack of qualified psychotherapists (both in outpatient and inpatient settings). The renewed law is expected to improve the training conditions for future psychotherapists and also meet the necessities of the health care system. Therefore, in the coming years the psychotherapeutic profession will appeal more to young students and will play an even more important role in the German health care system.

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