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Metacognitive beliefs of Polish adolescents during the COVID-19 pandemic. Psychometric properties of the MCQ-A

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Summary

The study aimed to provide information on the psychometric properties of the MCQ-A for Polish adolescents; confirm the factor structure of the instrument relative to the original scale; and present the intensity of dysfunctional metacognitive beliefs of adolescents during the pandemic.

A total of 375 adolescents aged 12−18 (M = 15.38; SD = 1.63) completed a demographics questionnaire, the CDI-2 questionnaire for the diagnosis of depression in children and adolescents, the *State and Trait Anxiety Inventory* (STAI), and the Polish version of the MCQ-A.

Structural validity was tested using confirmatory factor analyzes. Three types of models were tested. The best results were obtained using a model that had a five-factor scale structure without a higher-order factor. The Polish version has 28 items, and its psychometric properties are comparable with the results presented by the authors of the English version of the MCQ-A30.

The results showed that the Polish version of the MCQ-A is a reliable instrument for studying metacognitive beliefs in adolescents.

Key words: metacognition, depressive disorder, mental health

Introduction

According to the basic tenets of cognitive behavioural therapy, beliefs (i.e., the way a person interprets various events and their views about themself) have a decisive influence on emotional states and behaviour [1]; for instance, dysfunctional views shape mood, anxiety, and mental health disorders [2]. The primary task of therapy is to identify and conceptualise dysfunctional beliefs and guide the therapeutic process accordingly.

Research has shown that metacognitive beliefs (i.e., the way a person interprets their thoughts and feelings) play an equally important role as the beliefs themselves in forming emotions and behaviour [3−5]. Metacognitive processes allow the individual to monitor and control thoughts and assess emergent beliefs [4−6], though excessive worry and self-focusing can lead to maladaptive stress coping strategies [7]. Many studies have confirmed a connection between dysfunctional thoughts and mental health issues [3, 8]. Some have stressed the influence of worrying on the development and prevalence of hallucinations, delusions, anxiety disorders, alcohol abuse, eating disorders, and depression [4, 5, 9−11].

Most of research on metacognitive beliefs has focused on adults. However, there are voices in the literature on the subject indicating the need for similar exploration in the group of teenagers [8, 12]. Given that metacognition develops during childhood and adolescence, when most of the above-mentioned mental health disorders often begin [13,14], the knowledge gained from targeted studies could be translated into practice. In particular, the accurate identification of dysfunctional metacognitive beliefs amongst that group might help to improve diagnostic and therapeutic processes. Moreover, the COVID-19 pandemic has left a significant mark on the mental health of adolescents, so the need for specialist mental health support is even more pressing [15].

One of the best-known instruments for examining adolescents' metacognitive beliefs is the *Meta-Cognition Questionnaire for Adolescents* (MCQ-A). Currently, there are only three adaptations: French, Dutch and Persian [8]. The present study extends its availability to Poland.

The mental health of adolescents during the COVID-19 pandemic

The results of research conducted after the end of the COVID-19 pandemic clearly indicate that the mental state of adolescents deteriorated during the pandemic [15−18]. The period of adolescence itself is considered a time of dynamic change on many levels (biological, social, psychological, and spiritual). Chronic stress, the illness/death of loved ones due to COVID-19, parental job loss, isolation from one's peers, and uncertainty about learning (especially regarding courses assessed through examination) were serious risk factors for mental health disorders [16]. Authors examining the impact of the pandemic on the mental condition of young people emphasize the intensification of anxiety disorders and depression. They draw attention to a number of psychological difficulties that have a significant impact on the functioning of young people, including addiction to the Internet, alcohol or cannabis [17–20].

There are relatively few publications on the role of metacognitive beliefs among young people measured during the pandemic. In addition, the findings indicated that negative metacognitive beliefs may have played an intermediary role in depression amongst previously healthy adolescents [15]. It is hoped that our adaptation of the MCQ-A will initiate further research on this topic.

Measuring metacognitive beliefs

Cartwright-Hatton and Wells [12] constructed a questionnaire identifying metacognitive beliefs to enhance cognitive behavioural therapy for adult patients. The original version comprised 65 questions (MCQ-65) on the dysfunctional thoughts that led to perseverative thinking styles, attention bias and ineffective self-regulatory strategies (cognitive attentional syndrome – CAS) [8]. Because it was so popular, the authors created a shorter version for adults (MCQ-30) and equivalents for children and adolescents (MCQ-C 30 and MCQ-A 30) [12, 21]. A recent meta-analysis by Mayers et al. [8] shows that out of seven dedicated versions of the instrument for children and adolescents, the MCQ-A 30 obtained the best psychometric results and was thereafter recommended for 12−18-year-olds. The questions were based on the version for adults, but, as reported by Cartwright-Hatton et al. [21], some of the wordings were simplified and adapted to the cognitive abilities of children from 9 years of age.

The MCQ-A 30 assesses the severity of five metacognitive beliefs. The first two subscales measure positive and negative metacognitive beliefs (PB and UD, respectively). A high score on the first scale reflects a tendency to activate the misconception that thoughts of worry will motivate the respondent to act. According to Wells's model, believing these thoughts only results in excessive worry [22]. For example, a student may fall into the trap of feeling anxious when they think, "If I worry about my homework, it means I care and I will always be prepared." This sounds rational on the surface, but as Wells [4] points out, is it possible to be prepared without worrying and feeling anxious? A student with an anxious attitude has high emotional unrest due to dysfunctional beliefs. Fortunately, the MCQ-A 30 is sensitive to changes caused by therapy. Cognitive behavioural therapists use it to monitor their patients' weekly progress [4].

The second subscale − which measures negative beliefs about worrying (UD) − assesses the frequency of worries. For instance, a respondent may feel they lack control if they are not worried (e.g., "Once I start to worry, I can't stop.") The higher this indicator, the more often the respondent worries about being worried because not being worried is interpreted as dangerous and threatening [4, 23].

The remaining three subscales measure "Cognitive confidence" (CC), "Negative beliefs about the consequences of not controlling thoughts" (SPR) and "Cognitive self-consciousness" (CSC). The first of these is an indicator of the level of confidence in attention and memory as self-reported by the respondent (e.g., "I have a poor memory"). Individuals with emotional disorders tend to devalue their cognitive skills. Their low confidence in this regard means they have to care constantly for their memory and attention, which takes up space for the activation of constructive coping with stress [4, 13]. Cartwright-Hatton et al. [21] also note that this dimension is associated with a number of states relating to the emergence of intrusive thoughts in patients.

It is much the same with "Negative beliefs about the consequences of not controlling worrying thoughts" (SPR), which is associated with depression. The individual may

be convinced that depressive thoughts are dangerous and threatening, so they focus especially on them because they feel they should be controlled. The more they do this, the more they think about them. They fall into a vicious circle, sustaining their perseverative beliefs while constantly feeling threatened [18]. The SPR scale assesses the extent to which the respondent succumbs to dysfunctional beliefs about superstition, expected punishment, and responsibility for a certain way of thinking.

The last subscale measures cognitive self-consciousness (CSC), that is, the tendency to monitor one's thoughts, worries and one's awareness of them [24]. It is based on the mechanism of selective attention, which confirms the subject's belief that he or she rightly controls his or her dysfunctional metacognitive processes [21]. Spada et al. [5] argue that this may be constructive in some circumstances.

The overall score for the entire MCQ-A 30 scale is the sum of the scores from the five subscales. Each item is rated by the respondent on a scale from 1 ("I disagree") to 4 ("I strongly agree"). Thus, the possible range of scores for the questionnaire is 30–120 (6–30 for each subscale). The higher the overall score, the greater the severity of dysfunctional metacognitive beliefs.

Aim of the present study

The present study aimed to provide information about the psychometric properties of the MCQ-A for Polish youth and confirm its factor structure relative to the original scale. It is hoped that this will facilitate its dissemination amongst practitioners and researchers.

Material

A total of 375 people aged 12−18 participated in the study ($M = 15.38$; $SD = 1.63$); 300 subjects in the control group and 75 in the clinical group. The groups were homogeneous in terms of age ($t(373) = 0.063$; p = n/s) and sex (χ^2 (3) = 0.538; p = n/s) and differed significantly in place of residence (χ^2 (3) = 9.841; $p = 0.02$). In the clinical group, far more children came from large cities than from villages. The inclusion criteria for the control group were as follows: male and female students; aged 12−18 years; no diagnosis of a depressive episode or other psychiatric disorders; written informed and voluntary consent from participants and their parents to their involvement in the study and the processing of personal data (RODO). The inclusion criteria for the clinical group were as follows: female and male patients; aged 12−18 years; a psychiatrist-diagnosed depressive episode (F.32 according to ICD-10) without psychotic symptoms or other mental disorders; written informed and voluntary consent from participants and their parents to their involvement in the study and the processing of personal data (RODO). The exclusion criteria were the same for both groups: aged below 12 years or above 18 years; no written informed consent from

participants and their parents; a below-normal intellectual level; the presence of a somatic illness in the acute phase.

The parents completed the questionnaire on their child's health and the child completed the information questionnaire on his or her well-being during COVID – 19; the CDI-2 questionnaire for the diagnosis of depression in children and adolescents [26] (self-report version for adolescents); the *State and Trait Anxiety Inventory* (STAI) [27]; and the MCQ-A, adapted (with the consent of Cartwright-Hatton) to Polish conditions.

Procedure

The MCQ-A was translated into Polish in accordance with the principles of test adaptation. In order to determine the understandability of the content, the translated scale was assessed by Polish students at various stages of learning. The actual research was conducted in 2020–2021 during the lockdown period.

The target group (students aged 12–18) was recruited (using snowball sampling) through social media, non-governmental organisations (NGOs) working with young people, and schools (via school psychologists). Potential participants were forwarded information about the study via email. The survey was conducted by correspondence because of the prevailing situation. Each participant was given two envelopes, a return stamp, and a set of paper questionnaires. These were returned to a university address upon completion. The consent form and the RODO questionnaire were sent back in the first envelope (for purposes of anonymisation) and the completed questionnaires in the second.

Purposive selection was used to recruit participants who had been diagnosed with depression. Because of the severe restrictions on entry to hospital wards, problems with contacting parents, and restrictions on admissions at the time of the study, patients from the Department of Psychiatry in Lublin and patients recruited by psychological and educational counselling centres were included in the study, which was conducted by a specialist (either a psychiatrist or a psychologist). The clinical group with depressive episode constituted the comparison group.

The project was approved by the Research Ethics Committee of the Institute of Psychology of John Paul II Catholic University of Lublin (KEBN_43/2020).

Results

Confirmatory factor analysis

The results of confirmatory factor analysis and the best factor model for the control group (N = 300) are presented herein. Confirmatory factor analysis was considered the most suitable way to test the hypothesis given the five types of metacognitive content listed by Cartwright-Hatton et al. [21]. The R package lavaan [28] and semPlot

package were used to visualise the results of the structural equation modelling [29]. The calculations were based on the ULSMV algorithm (unweighted least squares mean – and variance-adjusted test statistic). This method makes it possible to calculate resistant estimates and corrections of standard errors because of the formal nature of observable variables [25].

Preliminary factor analysis showed that the MCQA test items 5 and 12 required a scale rotation, while items 16 and 18 did not have a significant association with "Cognitive self-consciousness" (CSC). They were therefore excluded from the model. After these operations, Cronbach's alpha was 0.874. The remaining scales oscillated around 0.724 ("Negative beliefs about the consequences of not controlling thoughts" – SPR); 0.762 ("Positive metacognitive beliefs" – PB); 0.827 ("Negative metacognitive beliefs" – UD), and 0.833 for "Cognitive confidence" (CC). The "Cognitive self-consciousness" (CSC) measure was the least reliable (0.562).

Analytical strategy for selecting a factor model

Three types of factor model were tested: (1) model of orthogonal factors assuming no correlation between the examined factors, (2) skewed model assuming correlations between factors, (3) higher-order factor model, which required the presence of the overarching MCQ-A factor and its impact on the five individual subfactors.

The results of the model comparison analysis presented in Table 1 indicate that the data significantly better fitted the skewed model than the orthogonal model. Further analysis indicated that the second-order factor model better fitted the data than the orthogonal model. The last comparison indicated that the data fitted the skewed model significantly better than the second-order factor model. All possible comparisons showed that the data were better fitted to the skewed model.

Table 1. **Coefficients of fit of data to the factor models**

Comparison	Model	df	χ^2	χ^2 difference	df difference
1	Skewed	335	496.10		
	Orthogonal	345	3721.57	265.37***	10
2	Second-order factor	340	550.92		
	Orthogonal	345	3721.57	172.44	5
3	Skewed	335	496.10		
	Second-order factor	340	550.92	15.44**	5

df = degrees of freedom; ** p <0.01; *** p <0.001; χ^2 of differences – scaling by satorra.2000 method.

Confirmatory factor analysis results

Previous analysis allowed for testing alternative versions of factor models of the studied phenomenon and selecting the system to which the collected data were best fitted.

The more accurate data-to-model statistics presented in Table 2 show that most of the statistics for the skewed model were consistent with generally agreed-upon criteria for matching structural models and their acceptance.

Overall, the data fitted well with the factor model in which correlations between the factors were assumed. Table 3 shows the results of the confirmatory factor analysis estimates, including factor loadings. The latent variables significantly influenced the variability of the indicators (the MCQ-A test items). The strength of the influence ranged from a moderate ($\beta = 0.24$ for MCQA 5) to a significant ($\beta = 0.90$ for MCQA 26).

Table 2. **Coefficients of fit of data to individual models**

Coefficient	Model		
	Orthogonal	Skewed	Second-order factor
N of parameters	61	71	66
χ^2	3721.57	496.10	550.92
df	345.00	335.00	340.00
p	<0.001	<0.001	<0.001
CFI	0.48	0.98	0.94
TLI	0.43	0.97	0.93
NFI	0.46	0.93	0.88
IFI	0.48	0.98	0.94
N	300.00	300.00	300.00
RMSEA	0.18	0.05	0.06
RMSEA lower 95% DPU	0.18	0.04	0.05
RMSEA lower 95% of the GPU	0.19	0.05	0.06
SRMR	0.18	0.06	0.08
GFI	0.76	0.97	0.95
AGFI	0.71	0.96	0.94

CFI, TLI, NFI, IFI, GFI, AGFI = (ideally if = 1, acceptable if >0.90); RMSEA = (ideally if <0.05, acceptable if <0.08); SRMR = (ideally if <0.05, acceptable if <0.10).

Table 3. **Confirmatory factor analysis estimates**

Factor	Test position	β	SE	Z	DPU	GPU
PB	MCQ-A 1	0.51	0.07	7.65***	0.38	0.64
PB	MCQ-A 7	0.55	0.07	7.71***	0.41	0.69
PB	MCQ-A 10	0.66	0.07	8.97***	0.52	0.81
PB	MCQ-A 19	0.66	0.07	9.33***	0.52	0.80
PB	MCQ-A 23	0.70	0.07	10.02***	0.56	0.83
PB	MCQ-A 28	0.48	0.08	5.99***	0.32	0.64
UD	MCQ-A 2	0.30	0.06	4.95***	0.18	0.42
UD	MCQ-A 9	0.79	0.05	17.51***	0.70	0.88
UD	MCQ-A 11	0.75	0.04	17.92***	0.67	0.83
UD	MCQ-A 15	0.69	0.05	14.74***	0.60	0.79
UD	MCQ-A 21	0.83	0.04	22.40***	0.76	0.91
UD	MCQ-A 4	0.62	0.05	12.58***	0.53	0.72
CC	MCQ-A 8	0.58	0.06	9.34***	0.45	0.70
CC	MCQ-A 14	0.67	0.05	12.36***	0.56	0.77
CC	MCQ-A 17	0.75	0.05	14.42***	0.65	0.86
CC	MCQ-A 24	0.64	0.06	11.14***	0.53	0.75
CC	MCQ-A 26	0.90	0.05	18.64***	0.80	0.99
CC	MCQ-A 29	0.52	0.07	7.65***	0.38	0.65
SPR	MCQ-A 6	0.61	0.06	10.29***	0.50	0.73
SPR	MCQ-A 13	0.34	0.06	5.40***	0.21	0.46
SPR	MCQ-A 20	0.70	0.05	14.36***	0.60	0.79
SPR	MCQ-A 22	0.65	0.05	12.91***	0.55	0.75
SPR	MCQ-A 25	0.55	0.05	10.20***	0.45	0.66
SPR	MCQ-A 27	0.33	0.07	4.87***	0.19	0.46
CSC	MCQ-A 3	0.38	0.08	4.96***	0.23	0.53
CSC	MCQ-A 5	0.24	0.06	3.91***	0.12	0.35
CSC	MCQ-A 12	0.43	0.08	5.45***	0.28	0.59
CSC	MCQ-A 30	0.46	0.08	5.59***	0.30	0.63

PB − "Positive metacognitive beliefs about worrying"; UD − "Negative metacognitive beliefs about worrying"; CC − "Cognitive confidence"; SPR − "Negative beliefs about the consequences of lack of control over thoughts"; CSC − "Cognitive self-consciousness"; β = standardised factor loading; SE = standard error for standardised factor loading; 95% PU for β = 95% confidence interval for standardised factor loading; *Z* = standardised distribution statistic; p = statistical significance.

Although the participants were of different ages (between 12 and 18), they were treated as a homogenous group in accordance with the design of the adapted questionnaire, albeit Table 4 shows the mean scores on the MCQ-A scales for each age group. Because one participant was 12 years old (age 13), she was included in the 12−13-year-old group.

Table 4. **Results of means and standard deviations by age groups for individual MCQ-A subscales**

Subscale	12–13 years olds (N = 46)	14 years olds (N = 58)	15 years olds (N = 56)	16 years olds (N = 51)	17 years olds (N = 56)	18 years olds (N = 33)
Positive metacognitive beliefs	9.84 (3.71)	9.62 (3.00)	9.71 (3.46)	8.48 (3.49)	10.25 (2.92)	10.00 (4.63)
Negative metacognitive beliefs	11.98 (4.52)	14.23 (3.70)	14.27 (5.18)	15.10 (4.85)	13.32 (4.96)	13.09 (5.00)
Cognitive confidence	12.46 (4.29)	12.05 (4.20)	12.50 (3.95)	11.66 (4.35)	12.52 (4.31)	9.91 (3.99)
SPR	14.12 (4.34)	14.38 (3.63)	13.82 (4.26)	13.93 (3.69)	13.96 (4.22)	13.82 (3.99)
Cognitive self-consciousness	16.05 (3.76)	14.45 (3.19)	15.57 (3.17)	15.84 (3.02)	16.43 (3.44)	15.52 (2.65)
Total score	64.44 (4.84)	64.73 (10.25)	65.88 (12.19)	65.01 (10.97)	66.48 (12.38)	(12.85)

Construct validity analysis

Relationships between measurements

A series of correlation analyses was carried out between the results of the MCQ--A scales and the scales of the questionnaires measuring anxiety and depression. All MCQ-A factors were positively correlated with increases in scores for trait anxiety, state anxiety and depression. Similar results of the relationship between the measurements were obtained for the clinical group. In the latter, there was no significant relationship between the "Positive metacognitive beliefs" (PB) scale and the results of trait anxiety, state anxiety and depression. The results are presented in Table 5.

Table 5. **Correlations of the MCQ-A measures with trait anxiety, state anxiety and depression in the control and clinical groups**

Control group	1	2	3	4	5	6	7
PB (1)							
UD (2)	0.14*						
CC (3)	0.26***	0.30***					
SPR (4)	0.27***	0.56***	0.28***				
CSC (5)	0.20***	0.71***	0.26***	0.47***			
CDI (6)	0.27***	0.63***	0.44***	0.48***	0.67***		
Trait anxiety (7)	0.27***	0.74***	0.33***	0.51***	0.74***	0.82***	
Trait anxiety (8)	0.16**	0.62***	0.31***	0.43***	0.67***	0.77***	0.80***
Clinical group	1	2	3	4	5	6	7
PB (1)							
UD (2)	-0.20						
CC (3)	0.01	0.39***					
SPR (4)	-0.19	0.64***	0.34**				
CSC (5)	-0.21	0.61***	0.32**	0.53***			
CDI (6)	0.09	0.60***	0.26*	0.43***	0.58***		
Trait anxiety (7)	-0.03	0.69***	0.36**	0.50***	0.68***	0.75***	
State anxiety (8)	-0.14	0.62***	0.22	0.49***	0.60***	0.64***	0.79***

PB − "Positive metacognitive beliefs about worrying"; UD − "Negative metacognitive beliefs about worrying"; CC − "Cognitive confidence"; SPR − "Negative beliefs about the consequences of lack of control over thoughts"; CSC − "Cognitive self-consciousness"; * p <0.05, ** p <0.01, *** p <0.001.

Differences between the groups in terms of the intensity of MCQ-A Measurements, trait anxiety, state anxiety, and depression

To test the differences between the study groups in terms of the intensity of MCQ--A measurements, trait anxiety, state anxiety, and depression, a series of analyses was performed using Student's *t*-test for independent samples (Table 6). The results revealed that both groups had a similar intensity of "Positive metacognitive beliefs" (PB). Further analysis showed that the clinical group exhibited a greater intensity in the other MCQ-A scores, state and trait anxiety, and the intensity of depression. Cohen's

d indicated that these differences were moderate for "Cognitive confidence" (CC) but strong in the remaining measures.

Table 6. **Differences between study groups in the intensity of MCQ-A measures, trait anxiety, state anxiety, and depression**

Measure	t	df	p	Cohen's d	95%CI for B		Clinical group (a)			Control group (b)			Difference
					DPU	GPU	M	SD	SE	M	SD	SE	
PB	1.74	373	0.083	0.22	-0.03	0.48	1.79	0.62	0.07	1.66	0.57	0.03	a = b
UD	6.75	373	<0.001	0.87	0.58	1.16	2.92	0.75	0.09	2.24	0.80	0.05	a > b
CC	3.03	373	0.003	0.39	0.13	0.65	2.22	0.91	0.10	1.93	0.71	0.04	a > b
SPR	5.91	373	<0.001	0.76	0.48	1.04	2.79	0.59	0.07	2.29	0.67	0.04	a > b
CSC	4.77	373	<0.001	0.62	0.34	0.89	2.91	0.58	0.07	2.51	0.67	0.04	a > b
CDI	10.03	373	<0.001	1.30	0.96	1.62	26.4	10.07	1.16	14.44	9.02	0.52	a > b
Trait anxiety	7.70	373	<0.001	0.99	0.69	1.29	59.36	10.07	1.16	48.60	11.01	0.64	a > b
State anxiety	8.93	373	<0.001	1.15	0.84	1.46	52.75	11.67	1.35	39.60	11.35	0.66	a > b

t – Student's t; df – degrees of freedom; p – statistical significance; Cohen's d – standardised effect size coefficient (weak d <0.30; moderate 0.30−50; strong >0.50).

Discussion

The results of the present study show that the Polish adaptation of the MCQ-A is a reliable instrument for studying metacognitive beliefs in adolescents. It comprises 28 items; Items 16 and 18 ("I always pay attention to what I think" and "I watch carefully how my mind works") were removed. The Dutch and French adaptations of the MCQ--A also omitted several items from the original tool [33, 34]. The Dutch adaptation, similar to the Polish one) had difficulties with item 16. In the Polish case, it may be that the scale statements were biased (i.e., item bias) and ecologically inadequate [35]. Adolescents may not pay as much attention to monitoring their thought processes as adults (or their peers in the clinical group), so they may not have understood the question. It is worth noting that the authors of the French adaptation encountered a similar difficulty with the "Cognitive self-consciousness" scale (Item 12 in particular) and drew the same conclusion [33].

In the case of the Polish version, the above hypothesis explaining the encountered difficulties could be verified in future research and an analysis of the equivalence of measurement scales for different age groups could be performed. This would help to resolve the question of whether particular groups of respondents perceive the con-

struct of metacognitive beliefs in the same way. The current version of the MCQ-A 28, however, shows good reliability (0.874) for the entire scale. The psychometric properties are comparable with the results presented by the authors of the English version of the MCQ-A 30 [21]. In the present study, the lowest reliability was found in "Cognitive self-consciousness," from which items were omitted. The troublesomeness of this scale may have reflected the circumstances in which the study was conducted (i.e., the pandemic, lockdown and the subsequent correspondence nature of the data collection). The participants obtained an average depression score that was defined as elevated (despite the lack of a formal diagnosis of depression). The standard deviation for this score also indicated a variation in the severity of depressive symptoms within the study group (scores ranging from low to high). The severity of depressiveness in the non-depressed participants (characteristic of people diagnosed with depression) may have been reflected in the way they rated the statements that were subsequently deleted. This would also explain the high scores for the items in that factor. If the severity of depression was differentiated in the scale, it may be important for the conceptualisation of metacognitive problems amongst young patients. Understanding the relationship between depression and adolescents' metacognitive functioning may improve treatment planning, so it would be worth further examination. Characterising adolescents' well-being during COVID-19 goes beyond the purpose of this presentation and is the subject of another study [36].

The structure of the MCQ-A 28

As has been noted, the skewed model achieved the best fit. The analysis of standardised factor loadings demonstrated that the latent variables significantly influenced the variability of the test items, the strength of the influence ranging from moderate to strong. The present study confirmed the findings of several previous studies. Wolteres et al. [34] and Lachat Shakeshaft et al. [33] confirmed the five-factor structure of the MCQ-A. Wolteres et al. [34] tested a two-tier model in their research and proposed removing the higher-order factor and sticking to five factors, as per the present study. Although the parameters of the skewed model were the most accurate in Lachat Shakeshaft et al.'s study [33], they recommended a second-order factor model, the existence of which was also confirmed in their research

Construct validity of the MCQ-A 28

The positive correlation between the five factors on the MCQ-A scale and the severity of anxiety (state and a trait) and depression in the control group could be considered to be indicators of convergent validity of the MCQ-A 28. That said, there was a lack of association between positive cognitive beliefs and anxiety and depressi-

veness in the clinical group. This may be explained by referring to the relationship between stress, neural mechanisms and motivation because it plays a significant role in depressive disorders. Hollon et al. [37] studied the impact of stress on the neural basis of motivated behaviour, concluding that it affects multiple brain areas and different neurotransmitters. The ways neuronal excitability sites depend on the severity of the stressor relate to the lack of a clear effect of stress on the individual's behaviour. In other words, differences in the nature of the experienced stress may result in behaviours that differ qualitatively and quantitatively (e.g., anxiety can act both as a motivator and a demotivator). This argument seems reasonable given that there was no difference between the clinical and control groups in terms of "Positive metacognitive beliefs" – even though there was a positive relationship with anxiety and depression in the latter. The results seemed to highlight this ambiguity.

Limitations of the present study

Because it was difficult to conduct scientific research in 2020–2021 (e.g., students were learning online and hospitalised patients had to follow very restrictive sanitary conditions), the researchers used non-random (i.e., snowball) sampling; the situation at the time (and the constant waiting for the relaxation of restrictions) did not allow for any another way to collect data. Additionally, the impact of the pandemic itself and the isolation of students from their peers may have constituted a confounding variable. The pandemic was referred to in the title of the study to draw attention to the circumstances in which it was conducted.

Practical application of the MCQ-A 28 and conclusions

The Polish version of the MCQ-A allows for a broader exploration of individual metacognitive beliefs and monitoring the progress of their cognitive behavioural therapy (also during the pandemic). The Polish version of the MCQ-A has a five-factor scale structure whose psychometric properties are comparable with the results presented by the authors of the English adaptation (MCQ-A 30) [21]. In turn, the existing discrepancies and limitations constitute grounds for further analyses and work on an adapted questionnaire.

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