

Psychological Adjustment in Adult Adoptees: A Meta-Analysis

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Abstract

Background: Little is known about the effect adoption status has on psychological adjustment (for instance, depression, anxiety, problem behaviour, or drug misuse) in adulthood. The aim of this study was to conduct a meta-analysis to study the impact of adoption status on adult adoptees' psychological adjustment. **Method:** The review included 18 quasi-experimental studies conducted between 1993 and 2019. **Results:** Adoptees had significantly worse psychological adjustment than non-adoptees across all outcomes, except for the obsessive-compulsive disorder (OCD) and antisocial personality disorder (APD). The moderating analyses showed a significant effect for ethnicity and marital status. **Conclusions:** Our results shed light on the specific groups of adoptees at a higher risk of maladjustment. The outcomes most strongly influenced by adoptive status were angry emotions (hostility and anger), psychiatric care, drug abuse, and psychotic symptoms. These findings have clinical implications with regard to the support that practitioners can provide to adoptees and their families.

Keywords: Psychological adjustment; adoption; meta-analysis.

Resumen

Ajuste Psicológico en Adultos Adoptados/as: un Meta-análisis. **Antecedentes:** sabemos poco sobre el efecto que la condición adoptiva tiene en el ajuste psicológico (por ejemplo, depresión, ansiedad, conducta problemática o abuso de drogas) en la etapa adulta. El objetivo de este estudio es realizar un meta-análisis sobre el impacto que la condición adoptiva tiene en el ajuste psicológico de adultos adoptados. **Método:** esta revisión incluyó 18 estudios cuasi-experimentales llevados a cabo entre 1993 y 2019. **Resultados:** los adultos adoptados presentaron más dificultades en todos los indicadores analizados, salvo en el trastorno obsesivo-compulsivo (TOC) y en el trastorno antisocial de la personalidad (TAP). Los análisis de moderación indicaron un efecto significativo para el grupo étnico y estado marital. **Conclusiones:** nuestros resultados arrojan luz sobre los grupos específicos con un riesgo más alto para las dificultades psicológicas. Los indicadores más fuertemente influenciados por la condición adoptiva fueron las emociones negativas, acceso a servicios psiquiátricos, consumo de drogas y síntomas psicóticos. Estos resultados tienen implicaciones clínicas en cuanto al apoyo que los profesionales puedan dar a las personas adoptadas y sus familias.

Palabras clave: ajuste psicológico; adopción; meta-análisis.

Evidence indicates that adoptees adjust well, with mental health profiles, self-esteem, behavioural and academic performance that are similar to non-adopted children (Juffer & van IJzendoorn, 2007). However, experiences associated with adoption, such as separation and loss (Brodzinsky, 2011), and issues related to attachment and identity (Juffer & Tieman, 2009) might have a negative impact on children's psychological adjustment as it has been suggested that, as a group, adoptees have more mental health difficulties than their non-adopted peers (Askeland et al., 2017).

It has been suggested that such an impact might persist into adulthood (Siskind, 2006) but little is known about the effect adoption has on adult adoptees (Palacios & Brodzinsky, 2010). There is evidence that some adults who were adopted during their childhood do not show any difficulties (Pivnick, 2010). Other studies have suggested on the other hand that adult adoptees show

worse psychological adjustment in comparison to non-adopted adults (Oke et al., 2015; Smyer et al., 1998).

To our knowledge, no meta-analytic review has attempted to examine psychological adjustment only in adult adoptees. Two meta-analyses have included adult adoptees along with adoptees of all ages (Juffer & van IJzendoorn, 2005; Wierzbicki, 1993). This evidence suggests that adoptees, especially domestic ones, are overrepresented in mental health services and that the higher levels of maladjustment in adoptees, as compared to their non-adopted peers, are more present for adolescents than for children and adults.

In terms of adult adoptees and their mental health and psychological adjustment, a number of mental health problems, such as anxiety, depression, behavioural problems, personality disorders and substance misuse have been researched. For example, a recent systematic review (Melero & Sánchez-Sandoval, 2017) concluded that adoptees fared worse than non-adoptees in depression, anxiety, neuroticism, behavioural disorders, psychiatric contact, self-esteem, self-concept, self-control, and moral self-approval and fared similarly to non-adoptees in life satisfaction, psychoticism, and psychiatric inpatient admission. In addition, disorders such as obsessive-compulsive disorder (OCD) seem to

have a higher rate in adult adoptees than in the general population (Sánchez-Sandoval & Melero, 2019; Tieman et al., 2005).

Findings regarding substance abuse support the idea that adoptees have more problems with drugs and alcohol than non-adoptees (Sánchez-Sandoval & Melero, 2019; Sullivan et al., 1995). However, this finding appeared to be inconclusive (Melero & Sánchez-Sandoval, 2017).

The literature on somatic complaints has also highlighted inconclusive findings. Somatisation has been found to be higher in adult adoptees than in their non-adopted peers (Dekker et al., 2016; Sánchez-Sandoval & Melero, 2019). In contrast, Cederblad et al. (1999) found no significant differences between both groups.

It has been argued that the mixed findings found in the adoption literature might be because research has focused on the overall effects of the adoption process, neglecting the mediating processes and the moderating factors (Grotevant, 2003). Variables such as gender, age at the time of adoption, or whether the adoption was international or domestic have been put forward as variables that might modulate the impact of adoption status. In this sense, these variables are relevant to expand our understanding of the factors that might pose a negative impact on adoptees' psychological adjustment.

Younger adult adoptees have been found to have more difficulties than older ones; specifically, in terms of more loneliness (Feeny et al., 2007) and higher emotional arousability (Passmore et al., 2006). A later age of adoption has been linked to worse mental health (Levy-Shiff, 2001) and more delinquent behaviour and psychiatric contact (Laubjerg & Petersson, 2011).

While there is evidence of no gender differences in adoptees in terms of their psychological adjustment (e. g., Levy-Shiff, 2001; Oke et al., 2015; Passmore et al., 2006), other findings have concluded that such differences exist. Women have been found to have more depression (Decker & Omori, 2009) and more psychiatric contact (Laubjerg & Petersson, 2011) whereas men have been reported to have more delinquency and substance misuse (Kendler et al., 2012; Laubjerg & Petersson, 2011) and more antisocial behaviour (Sullivan et al., 1995).

Findings regarding adoptees' attained educational level state that they perform better academically than their non-adopted twins (Smyer et al., 1998), and better than non-adopted children from similar birth circumstances and retain this advantage in later adult qualifications (Maughan et al., 1998). A related factor -employment status- has been reported to pose a difficulty for adoptees. Collishaw et al. (1998) found that adopted men were more likely to have experienced unemployment than men in the same birth cohort. However, other studies have found similar rates of employment between adoptees and non-adoptees (Borders et al., 2000; Feeny et al., 2007).

Regarding marital status, adult adoptees are less likely to be married, to cohabit with their partners or to have intimate relationships (Tieman et al., 2006). However, it has been reported that the ones who marry tend to have positive and healthy relationships (Reitz & Watson, 1992).

Little is known about the impact of domestic or international adoption in adult adoptees. No differences between domestic and international female adult adoptees were reported in Rushton et al.'s study (2013), whereas Dekker et al. (2016) found that domestic adoptees had less anxiety and depression than international ones.

The main objective of this meta-analytic review is to gain information about the effects of adoption status in the psychological adjustment of adult adoptees. The research question was: How do adopted adults adjust psychologically in comparison to non-adopted adults looking at quasi-experimental studies? Based on previous findings from the adoption literature, it is expected to find more psychological difficulties among adult adoptees comparing to their non-adopted peers. In addition, the role of several moderators will be explored to account for the variability in the psychological adjustment outcomes.

Method

Literature search and inclusion criteria

Following PRISMA guidelines (Rethlefsen et al., 2021), four inclusion and exclusion criteria were established. Firstly, a broad publication period was set due to the little data available on adult adoptees. We decided on the period between 1993 and 2019 as there is another meta-analysis conducted in 1993 (Wierzbicki, 1993). Secondly, all studies had to be quasi-experimental and to have a control group formed by non-adopted adults. Thirdly, only articles that studied adult people were included (over 18 years old). Fourthly, all studies had to be published in English.

A systematic search was then carried out through Web of Science and ProQuest databases. The keywords used were "adopted adults", "adult adoptees", "adjustment", and "psychological adjustment". Additionally, we searched reference lists of relevant studies and authors were contacted for non-published data although no information was retrieved from this procedure. The search led to 796 potential studies.

Two researchers assessed those studies. First, articles that met the inclusion criteria were selected. Secondly, titles and abstracts of the articles were read to assess their suitability. Then, an evaluation of the methodology and the design of the study was conducted, leading to 58 articles. Thirty-seven were excluded because they did not meet either the second criterion or the third criterion. In the event of a discrepancy, consensus was reached after discussing the inclusion criteria. Ultimately, 21 studies met all inclusion criteria. The sampled articles include studies with several variables but only the variables that achieved a three-article cut-off were meta-analysed. Therefore, three more articles were excluded (Figure 1). The final set of 18 articles included 12 psychological adjustment outcomes: depression, anxiety, phobic anxiety, somatisation, OCD, angry emotions (hostility and anger), problem behaviour, antisocial personality disorder (APD), alcohol use, drug abuse, psychotic symptoms, and psychiatric care (admission or contact with a psychiatric practitioner or a service). We excluded self-esteem (2 articles), interpersonal sensitivity (2), paranoid ideation (1), panic disorder (2), obsessive-compulsive personality disorder (1), and avoidant personality disorder (1).

Methodological and sample characteristics and coding of studies

Two researchers conducted the data extraction. The coding spreadsheet included outcome, sample size, effect size and effect size variance, and several independent variables regarding the methodological and sample characteristics. We included the moderators in the database from the information of the sample composition of each study. In doing so, we registered the percentage

or number of the moderator characteristic (i.e., age of placement, age of participants, gender, international adoption, ethnicity, international adoption, education, employment, marital status) in

each study of the meta-analysis, when provided. Therefore, all the moderators were continuous. We coded the age of placement as the percentage of participants who had been adopted before they

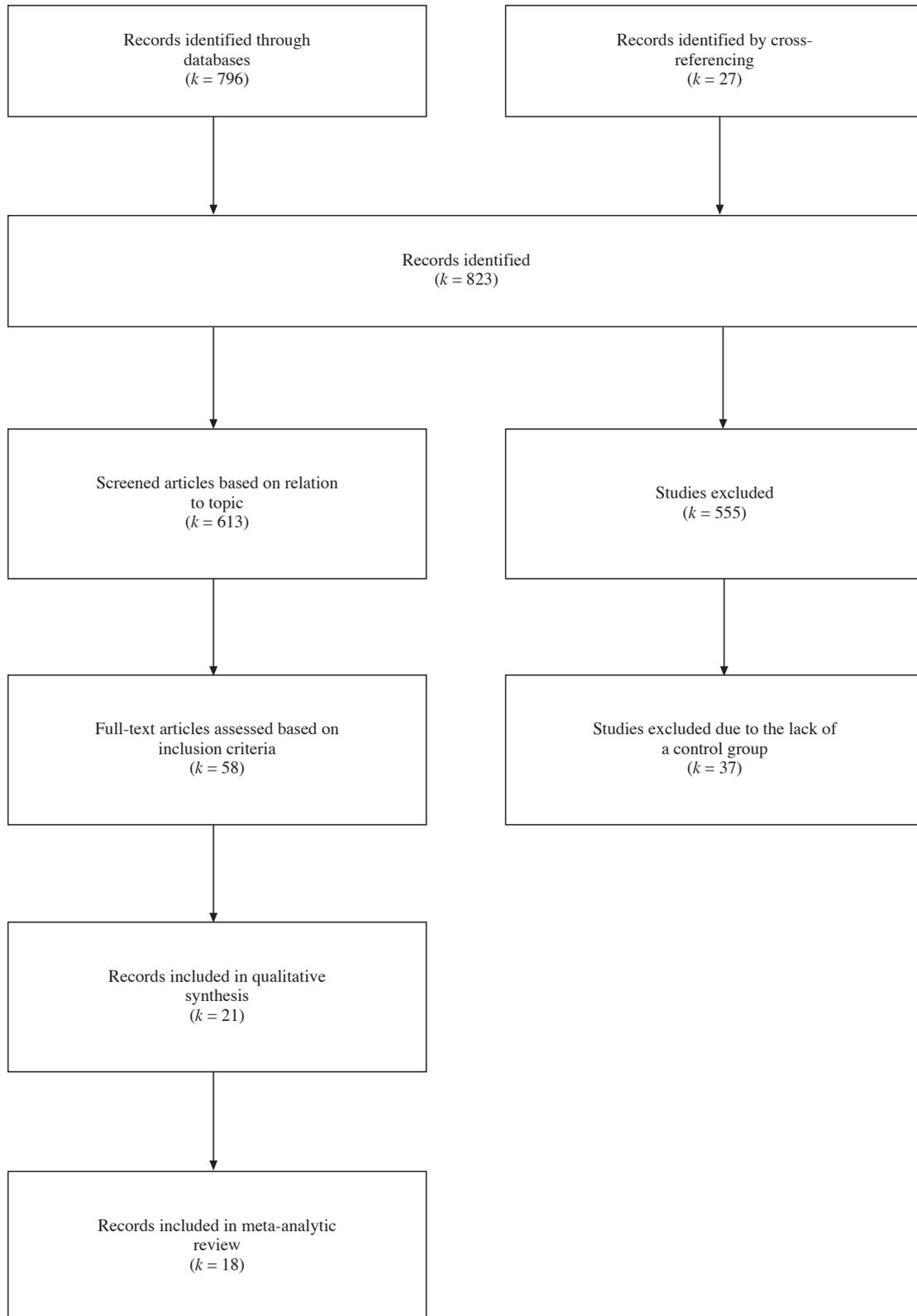


Figure 1. Flowchart of selected articles in the meta-analysis

were 1 year old; the age of participants as the mean age of the study sample; gender as the percentage of males in the study sample; international adoption as the percentage of internationally-adopted participants; ethnicity as the percentage of White participants; education as the percentage of participant who had attended university; employment as the percentage of participants who were employed; and marital status as the percentage of participants who were single. The interrater reliability across the study variables was 99%. When there were discrepancies among raters, consensus was reached after discussion.

Computation of effect sizes

We chose Hedges' g as the effect size because it outperforms Cohen's d when sample sizes are below 20 (Ellis, 2010). Hedges' g can be interpreted according to Cohen's guidelines (1988). Thus, those effects below 0.20 are considered small, between 0.20 and 0.50 medium, between 0.50 and 0.80 large, and above 0.80 very large.

We carried out the analyses using the Comprehensive Meta-Analysis 3.0 software. We applied a random effect model to compute the overall effect size (by study and by outcome) since it leads to more accurate results than fixed effect computations (Borenstein et al., 2007). Moreover, it has been stated that this approach is preferable when heterogeneity of studies is expected. Moreover, this approach lets the results to be applied beyond the included studies (Tufanaru et al., 2015). Because most studies included more than one variable, effect sizes were averaged by study to compute the overall effect.

Assessment of result stability

To assess the robustness of the obtained results, we calculated heterogeneity-homogeneity and publication bias. Q and I^2 statistics were computed to test the degree of homogeneity/heterogeneity. The null hypothesis of Q -test is that studies have homogeneous effects so, if Q -test is significant, the studies have dissimilar effects. Complementary, I^2 indicates the degree of heterogeneity of the studies being 25% low, 50% medium, and 75% high heterogeneity (Higgins et al., 2003).

We carried out the publication bias analyses by means of Fail-Safe N , Kendall's τb , and Egger's intercept. Since there is the possibility that non-published studies may annul the effect, Fail-Safe N statistic determines the number of studies with non-significant effects that would make the overall effect non-significant (Rosenthal, 1979). Complementary, Kendall's τb and Egger's intercept are formal test of the funnel plot asymmetry. A significant correlation suggests that publication bias exists, and large samples are more likely to be included in the analysis despite the size of their effect while small samples are usually included when they reflect large effects (Begg & Mazumdar, 1994; Egger et al., 1997).

Analyses of moderation effects

We examined by meta-regression the role of the study sample characteristics on explaining the effect size variability between studies. Specifically, we tested the predicted role of age of placement, age of participants, gender, international adoption, ethnicity, education, and marital status.

Results

The 18 studies led to a sample of 70 effect sizes from 2,605,196 individuals, 31,529 making up the experimental group of adult adoptees, and 2,573,676 composing the control group of non-adopted adults (Table 1).

Effect sizes of adoptees vs. non-adoptees differences on psychological adjustment

The global effect size for all studies and variables was 0.30 ($SE = 0.05$, 95% CI [0.21, 0.39]) which indicated a significant medium effect size of adoptees vs. non-adoptees on psychological adjustment. Thus, this result pointed out that adult adoptees tend to have more difficulties than their non-adopted peers do (Table 2).

The effect sizes by dependent variable in Table 2 show that adoptees had significantly worse psychological adjustment than non-adoptees in all study variables but OCD and APD.

The effect sizes ranged between 0.22 and 0.50, which indicates medium size effects in all cases. The highest effects sizes, denoting to which outcomes the adoptees' comparative maladjustment was more strongly linked to, were found for angry emotions (Hedges' $g = 0.50$, $SE = 0.18$, 95% CI [0.15, 0.85]), psychiatric care (Hedges' $g = 0.49$, $SE = 0.15$, 95% CI [0.20, 0.78]), drug abuse (Hedges' $g = 0.45$, $SE = 0.10$, 95% CI [0.25, 0.65]) and psychotic symptoms (Hedges' $g = 0.41$, $SE = 0.18$, 95% CI [0.07, 0.76]).

Stability of the effect sizes

The statistical indicators of the stability of the effect sizes are displayed in Table 3.

Regarding the heterogeneity of the results, the overall Q -test and I^2 indicated that there was a general heterogeneity of the results between studies ($Q = 55.27$, $p < .001$, $I^2 = 71.05$). Only the effect sizes concerning phobic anxiety ($Q = 6.33$, $p = .176$, $I^2 = 36.84$) and somatisation ($Q = 2.49$, $p = .288$, $I^2 = 19.71$) were statistically absent of heterogeneity. Thus, a similar effect size on phobic anxiety and somatisation across studies was found.

Regarding the publication bias, the general Fail-Safe N was 598, which implies that a high number of missed studies would be needed before the result lost statistical significance. The Fail-Safe N s by variable ranged from 7 (APD) to 474 (psychiatric care). Moreover, Kendall's τb and Egger's intercept were all non-significant. All this together suggests the absence of publication bias and the robustness of the findings.

Moderator effects

Given the presence of the heterogeneity described above, moderator analyses test if the sample characteristics may explain the variability between studies on effect size. As shown in Table 4, results of the Q -test indicated that participants' age, gender, education level and employment status were non-significant predictors of the variance between studies. Meanwhile, ethnicity and marital status had a significant effect.

Our results indicated significant differences on effect size in studies focusing on White adoptees. A greater percentage of White participants was linked to a lower effect size on the psychological adjustment. Regarding marital status, a higher percentage of single participants in the study sample was linked to a higher effect size, thus, to a greater negative impact on the psychological adjustment indicators meta-analysed.

Study	Outcome	N adoptees	N control	Hedges' g	SE	95% CI	z
Borders et al. 2000	Alcohol Use	100	70	0.16	0.16	[-0.14, 0.47]	1.05
	Depression						
	Drug abuse						
Cederblad et al. 1999	Angry emotions	27	55	0.08	0.23	[-0.37, 0.53]	0.37
	Anxiety						
	Depression						
	OCD						
Collishaw et al. 1998	Phobic anxiety	84	1,489	0.06	0.25	[-0.43, 0.55]	0.24
	Psychotic symptoms						
	Somatisation						
Coté & Lalumiere 2019	Alcohol use	316	130	0.25	0.10	[0.05, 0.45]	2.40*
	Depression						
	Problem behaviour						
Dekker et al. 2016	Psychotic symptoms	1,406	2035	0.15	0.04	[0.08, 0.22]	4.28***
	Problem behaviour						
	Somatisation						
Hjern et al. 2002	Alcohol use	11,320	853,419	0.58	0.09	[0.41, 0.76]	6.43***
	Drug abuse						
	Problem behaviour						
Hjern et al. 2018	Psychiatric care	9,396	930,944	0.18	0.02	[0.14, 0.22]	9.60***
	Depression						
	Psychiatric care						
Lindblad et al. 2003	Alcohol use	5,942	723,154	0.55	0.09	[0.37, 0.73]	6.07***
	Drug abuse						
	Psychiatric care						
Loehlin et al. 2007	Drug abuse	324	142	0.15	0.16	[-0.16, 0.45]	0.92
	Problem behaviour						
Oke et al. 2015	Depression	46	161	0.32	0.17	[-0.01, 0.65]	1.93
Passmore et al. 2006	Angry emotions	144	131	0.55	0.16	[0.24, 0.85]	3.49***
	Depression						
Rushton et al. 2013	Anxiety	72	5,115	0.03	0.18	[-0.32, 0.39]	0.18
	Depression						
	Angry emotions						
Sánchez-Sandoval & Melero 2019	Anxiety	134	530	0.52	0.10	[0.33, 0.72]	5.36***
	Depression						
	OCD						
	Phobic anxiety						
	Psychotic symptoms						
	Somatisation						
Sullivan et al. 1995	Alcohol use	24	1,212	0.55	0.40	[-0.23, 1.33]	1.38
	APD						
	Depression						
	Drug abuse						
	OCD						
Teyhan et al. 2018	Phobic anxiety	323	11,891	0.24	0.16	[-0.07, 0.55]	1.50
	Problem behaviour						
	Anxiety						
	Depression						
Tieman et al. 2005	Problem behaviour	1,484	695	0.19	0.23	[-0.27, 0.64]	0.81
	Alcohol use						
	APD						
	Depression						
	Drug abuse						
Westermeyer et al. 2015 & Yoon et al. 2012❖	OCD	378	42,503	0.31	0.12	[0.08, 0.54]	2.60**
	Phobic anxiety						
	Alcohol use						
	Anxiety						
	Psychotic symptoms						

Note: * $p < .05$, ** $p < .01$, *** $p < .001$; ❖ these two studies are presented together as the sample is the same, but the outcomes studied are different

Table 2
Adoptees and Psychological Adjustment by Outcome Variable

Outcome	k	n adoptees	n control	Hedges' g	SE	95% CI	z
Depression	12	12,444	993,437	0.22	0.05	[0.13, 0.32]	4.50***
Anxiety	6	2,418	60,789	0.23	0.10	[0.04, 0.42]	2.39*
Phobic anxiety	5	2,047	44,995	0.24	0.07	[0.10, 0.38]	3.43**
Somatisation	3	1,567	2,620	0.25	0.05	[0.16, 0.35]	5.06***
OCD	4	1,669	2,492	0.38	0.23	[-0.07, 0.82]	1.65 [†]
Angry emotions	4	621	846	0.50	0.18	[0.15, 0.85]	2.81**
Problem behaviour	6	13,713	868,829	0.29	0.09	[0.11, 0.48]	3.12**
APD	3	1,886	44,410	0.37	0.22	[-0.07, 0.81]	1.65 [†]
Alcohol use	7	19,332	1,622,542	0.33	0.09	[0.15, 0.50]	3.57***
Drug abuse	7	19,572	1,621,195	0.45	0.10	[0.25, 0.65]	4.40***
Psychotic symptoms	4	855	43218	0.41	0.18	[0.07, 0.76]	2.33*
Psychiatric care	3	26,658	2,507,517	0.49	0.15	[0.20, 0.78]	3.28***
OVERALL	17	31,520	2,573,676	0.30	0.05	[0.21, 0.39]	6.70***

Note: k = number of studies included in the meta-regression, OCD = Obsessive Compulsive Disorder, APD = Antisocial Personality Disorder
[†] p < .10. * p < .05, ** p < .01, *** p < .001

Table 3
Heterogeneity and Publication Bias Indexes for the Overall Studies and by Outcome Variable

Outcome	Heterogeneity				Fail-Safe N	Publication bias			
	Q-value	df	p	I ²		Kendall's tau b		Egger's test	
						Tau	p	t	p
Depression	31.36	11	.001	64.92	214	-0.20	.372	1.64	.131
Anxiety	11.66	5	.040	57.11	17	-0.20	.573	0.90	.417
Phobic anxiety	6.33	4	.176	36.84	15	-0.10	.807	0.98	.398
Somatisation	2.49	2	.288	19.71	24	1.00	.117	2.10	.282
OCD	12.43	3	.006	75.87	20	0	1.00	1.68	.235
Angry emotions	21.22	3	< .001	85.86	55	0	1.00	0.23	.838
Problem behaviour	62.71	5	< .001	92.03	163	0.33	.348	0.27	.801
APD	9.02	2	.011	77.84	7	0.33	.601	0.62	.647
Alcohol use	22.68	6	.001	73.55	93	0.05	.880	0.30	.774
Drug abuse	21.80	6	.001	72.48	131	0.25	.453	0.52	.623
Psychotic symptoms	17.52	3	.001	82.88	39	-0.33	.497	0.74	.536
Psychiatric care	124.93	2	< .001	98.40	474	0.33	.602	0.89	.538
OVERALL	55.27	16	< .001	71.05	598	-0.16	.365	0.87	.387

Note: OCD = Obsessive Compulsive Disorder, APD = Antisocial Personality Disorder

Table 4
Meta-regression Coefficients of Moderator Effects on Effect Size

Moderator	k	Q	β	SE	95% CI	z	r ²
% Adopted < 1 year	10	2.71 [†]	-0.005	0.003	[-0.012, 0.001]	-1.65 [†]	.51
Age	15	0.58	-0.006	0.001	[-0.021, 0.009]	-0.76	< .01
Gender (% males)	16	0.39	0.002	0.003	[-0.005, 0.009]	0.63	< .01
Ethnicity (% Whites)	4	7.16**	-0.003	0.001	[-0.006, -0.001]	-2.68**	1.00
% International adoptions	13	3.64 [†]	0.002	0.001	[> -0.001, 0.005]	1.91 [†]	< .01
Educational level (% university)	7	0.04	0.001	0.003	[-0.004, 0.006]	0.19	< .01
% Employment	7	< 0.01	> -0.001	0.004	[-0.007, 0.007]	-0.03	< .01
Marital status (% single)	6	8.14**	0.004	0.002	[0.001, 0.007]	2.85**	1.00

Note: k = number of studies included in the meta-regression, r² = index analogous to r² in linear regression which represents the ratio of explained inter-study variance, Q = contrast statistic of explained between-study variance by the moderator

Discussion

Even though there are some reports of similar level of adjustment in adult adoptees and non-adoptees (Loehlin et al., 2007), most of the literature highlights the lower levels of well-being in adult adoptees (Melero & Sánchez-Sandoval, 2017; Oke et al., 2015).

In our meta-analysis, we investigated the psychological adjustment of adopted adults. Consistent with our expectations, we found that adult adoptees showed higher rates of psychological maladjustment, as compared to their non-adopted peers. In addition, our findings show the range of symptoms and difficulties that might be experienced by adult adoptees.

One of the outcomes that emerged as most strongly influenced by adoption status compared to non-adoptee samples was angry emotions (hostility and anger). Consistent with our findings, angry emotions have been reported to be higher in adult adoptees than in non-adoptees (Côté & Lalumière, 2019; Sánchez-Sandoval & Melero, 2019).

Psychiatric care (in the form of admission or contact with a psychiatric practitioner or a service) seems to be another outcome influenced by adoption status (compared to non-adoptee samples). Regardless of the reason for that specialized care, our meta-analysis contributes to highlight that adult adoptees, as compared with non-adopted adults, seem to be requiring those services more than non-adoptees (Hjern et al., 2002; Laujberg et al., 2009). However, there is evidence pointing to the contrary (Laujberg & Peterson, 2010; 2011).

Our finding of substance abuse disorder being one of the negative impacts linked to adoption status is also consistent with previous research (Westermeyer et al., 2007). Other negative impacts reported before include alcohol use (Hjern et al., 2002; Yoon et al., 2012). Nonetheless, adoptees and non-adoptees have been found to fare similarly in alcohol use (Borders et al., 2000).

The adoption literature also suggests that adult adoptees show more problem behaviours, such as delinquency, crime, antisocial and disruptive behaviours, than their non-adopted peers (Côté & Lalumière, 2019; Hjern et al., 2002; Sullivan et al., 1995; Teyhan et al., 2018). This finding from the literature is also supported in this meta-analysis. It should be noted however that most adoptees have non-problematic adjustment (Côté & Lalumière, 2019).

The personality disorder analysed in this study – APD – yielded non-significant differences between adult adoptees and non-adoptees. However, adoption status has been linked previously not only to APD, but also to paranoid, avoidant, dependent and obsessive-compulsive personality disorders (Reichborn-Kjennerud et al., 2007; Torgersen et al., 2008).

There is evidence of the elevated prevalence of depression in adult adoptees (Melero & Sánchez-Sandoval, 2017; Westermeyer et al., 2014), although this has been found to be more prevalent in men (Storsbergen et al., 2010). Anxiety disorders have been found to be more common among adoptees than in non-adoptees (Westermeyer et al., 2014). Our findings seem to support this idea. Somatisation follows a similar pattern (Dekker et al., 2016; Sánchez-Sandoval & Melero, 2019), as observed in this meta-analysis, although no significant differences have also been reported (Cederblad et al., 1999). OCD seems to be more common among adoptees than among non-adoptees (Cederblad et al., 1999).

Our findings contribute to shed light on specific characteristics of adoptees with a higher risk of maladjustment. In our meta-analysis, studies with higher representation of single individuals

seemed to be sample with more psychological difficulties than those who had a higher presence of participants in an intimate relationship. The literature on adopted children and adolescent has described attachment issues in this population (van den Dries et al., 2009), and it seems that this pattern of disorganized attachment might expand into adulthood.

The percentage of White people, along with the percentage of international adoptions, has emerged as a strong moderator. The meta-analytic evidence gathered in this study contributes to expand our knowledge regarding the potential impact of these factors, considering the inconclusive nature of the findings in adulthood so far. Rushton et al. (2013) reported no differences in domestic and international adoptees in terms of their psychological adjustment. However, evidence pointing to international adoptees faring worse than domestic ones is also available (Dekker et al., 2016). Our findings note that ethnicity - being White- and less presence of international adoption are linked with better adjustment outcomes.

Our findings highlight that men and women are similarly influenced by adoption status in terms of the outcomes analysed as the presence of more men of women in the samples was not related to the between-studies variability. However, there is support for the idea of more internalizing difficulties in female adoptees (Decker & Omori, 2009) and more externalizing issues in male adoptees (Kendler et al., 2012; Laujberg & Petersson, 2011). Findings about adoptees' age are inconclusive. In our meta-analysis, the age at the time of the study did not emerge as a moderating factor, consistent with the findings by Côté and Lalumière (2019).

We did not find a significant effect of the attained educational level in the psychological impact of adoption status, contrary to previous research (Maughan et al., 1998; Smyer et al., 1998). Likewise, employment status did not seem to moderate the impact of adoption status, as reported before (Borders et al., 2000; Feeney et al., 2007).

Despite the limited evidence, it seems important to analyse and integrate all the relevant evidence available on the mental health and adjustment of adult adoptees. The robustness of the present results pinpoints towards the relevance of the study but also sets the need of further research in this area. In addition, several limitations should be stated. This meta-analysis did not include unpublished data, so future research should try to gather all available evidence.

We excluded some variables, setting the need for further research. Variables identified are paranoid ideation (Westermeyer et al., 2015), interpersonal sensitivity (Cederblad et al., 1999), adult attachment security (Feeney et al., 2007), parental bonding (Passmore et al., 2005), panic disorder (Sullivan et al., 1995), self-concept (Levy-Shiff, 2001) and self-esteem (Kelly et al., 1998). In addition, further research is needed to explore personality disorders, since the limited evidence seems to point out to higher rates among adoptees (Westermeyer et al., 2015).

Lastly, we need to research further the moderating role of other relevant factors, such as pre-adoptive variables (Melero & Sánchez-Sandoval, 2017), or parental readiness (Simmel, 2007). In addition, the role of searching for origins should be investigated. The limited information available on this factor has prevented us from including it, and the findings seem to be inconclusive so far (Côté & Lalumière, 2019).

This meta-analytic review contributes valuable information for practitioners and policy makers to provide education, preventative

and intervention strategies for adoptees across their life span, and for their families (Yoon et al., 2012). Clinicians and practitioners should be aware of those outcomes most strongly influenced by adoptive status, so that they can support adoptees and their families in more effective ways.

In the same fashion, these findings should be useful in order to create awareness so that support for adoptees and their families is available to them pre-, during and post- adoption. As reported in Palacios (2007), the needs of adoptees and their families in this later stage are varied and there is a need of effective support for them.

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- References marked with an asterisk indicate studies included in the meta-analysis.
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