

ASSESSMENT OF PSYCHOLOGICAL FUNCTIONING AND RISK IN HEALTHCARE SETTINGS

EDITED BY: Silvia Salcuni, Daniela Di Riso and Jian-Bin Li

PUBLISHED IN: Frontiers in Public Health and Frontiers in Pediatrics





frontiers

Frontiers eBook Copyright Statement

The copyright in the text of individual articles in this eBook is the property of their respective authors or their respective institutions or funders. The copyright in graphics and images within each article may be subject to copyright of other parties. In both cases this is subject to a license granted to Frontiers.

The compilation of articles constituting this eBook is the property of Frontiers.

Each article within this eBook, and the eBook itself, are published under the most recent version of the Creative Commons CC-BY licence.

The version current at the date of publication of this eBook is CC-BY 4.0. If the CC-BY licence is updated, the licence granted by Frontiers is automatically updated to the new version.

When exercising any right under the CC-BY licence, Frontiers must be attributed as the original publisher of the article or eBook, as applicable.

Authors have the responsibility of ensuring that any graphics or other materials which are the property of others may be included in the CC-BY licence, but this should be checked before relying on the CC-BY licence to reproduce those materials. Any copyright notices relating to those materials must be complied with.

Copyright and source acknowledgement notices may not be removed and must be displayed in any copy, derivative work or partial copy which includes the elements in question.

All copyright, and all rights therein, are protected by national and international copyright laws. The above represents a summary only. For further information please read Frontiers' Conditions for Website Use and Copyright Statement, and the applicable CC-BY licence.

ISSN 1664-8714

ISBN 978-2-88966-508-2

DOI 10.3389/978-2-88966-508-2

About Frontiers

Frontiers is more than just an open-access publisher of scholarly articles: it is a pioneering approach to the world of academia, radically improving the way scholarly research is managed. The grand vision of Frontiers is a world where all people have an equal opportunity to seek, share and generate knowledge. Frontiers provides immediate and permanent online open access to all its publications, but this alone is not enough to realize our grand goals.

Frontiers Journal Series

The Frontiers Journal Series is a multi-tier and interdisciplinary set of open-access, online journals, promising a paradigm shift from the current review, selection and dissemination processes in academic publishing. All Frontiers journals are driven by researchers for researchers; therefore, they constitute a service to the scholarly community. At the same time, the Frontiers Journal Series operates on a revolutionary invention, the tiered publishing system, initially addressing specific communities of scholars, and gradually climbing up to broader public understanding, thus serving the interests of the lay society, too.

Dedication to Quality

Each Frontiers article is a landmark of the highest quality, thanks to genuinely collaborative interactions between authors and review editors, who include some of the world's best academicians. Research must be certified by peers before entering a stream of knowledge that may eventually reach the public - and shape society; therefore, Frontiers only applies the most rigorous and unbiased reviews.

Frontiers revolutionizes research publishing by freely delivering the most outstanding research, evaluated with no bias from both the academic and social point of view. By applying the most advanced information technologies, Frontiers is catapulting scholarly publishing into a new generation.

What are Frontiers Research Topics?

Frontiers Research Topics are very popular trademarks of the Frontiers Journals Series: they are collections of at least ten articles, all centered on a particular subject. With their unique mix of varied contributions from Original Research to Review Articles, Frontiers Research Topics unify the most influential researchers, the latest key findings and historical advances in a hot research area! Find out more on how to host your own Frontiers Research Topic or contribute to one as an author by contacting the Frontiers Editorial Office: frontiersin.org/about/contact

ASSESSMENT OF PSYCHOLOGICAL FUNCTIONING AND RISK IN HEALTHCARE SETTINGS

Topic Editors:

Silvia Salcuni, University of Padua, Italy

Daniela Di Riso, University of Padua, Italy

Jian-Bin Li, The Education University of Hong Kong, Hong Kong

Citation: Salcuni, S., Riso, D. D., Li, J.-B., eds. (2021). Assessment of Psychological Functioning and Risk in Healthcare Settings. Lausanne: Frontiers Media SA.
doi: 10.3389/978-2-88966-508-2

Table of Contents

- 04** ***Mothers' Depression, Anxiety, and Mental Representations After Preterm Birth: A Study During the Infant's Hospitalization in a Neonatal Intensive Care Unit***
Carmen Trumello, Carla Candelori, Marika Cofini, Silvia Cimino, Luca Cerniglia, Marinella Paciello and Alessandra Babore
- 13** ***Gender, Personality Traits and Experience With Psychiatric Patients as Predictors of Stigma in Italian Psychology Students***
Leonardo Zaninotto, Jia Qian, Yao Sun, Giulia Bassi, Marco Solmi and Silvia Salcuni
- 23** ***Rorschach Assessment in Suicide Survivors: Focus on Suicidal Ideation***
Arianna Palmieri, Johann Roland Kleinbub, Stefania Mannarini, Sara Molinaro, Cristina Castriotta and Paolo Scocco
- 32** ***The Influences of Drug Abuse on Mother-Infant Interaction Through the Lens of the Biopsychosocial Model of Health and Illness: A Review***
Ilaria Cataldo, Atiqah Azhari, Aurora Coppola, Marc H. Bornstein and Gianluca Esposito
- 40** ***The Focal Play Therapy: A Clinical Approach to Promote Child Health and Family Well-being***
Ilaria Chirico, Federica Andrei, Paola Salvatori, Irene Malaguti and Elena Trombini
- 49** ***School Climate, Loneliness, and Problematic Online Game Use Among Chinese Adolescents: The Moderating Effect of Intentional Self-Regulation***
Chengfu Yu, Wentao Li, Qiao Liang, Xuelan Liu, Wei Zhang, Hong Lu, Kai Dou, Xiaodong Xie and Xiong Gan
- 58** ***Hospitalized Children: Anxiety, Coping Strategies, and Pretend Play***
Elisa Delvecchio, Silvia Salcuni, Adriana Lis, Alessandro Germani and Daniela Di Riso
- 66** ***Parental Reflective Functioning in Mothers and Fathers of Children With ADHD: Issues Regarding Assessment and Implications for Intervention***
Claudia Mazzeschi, Livia Buratta, Alessandro Germani, Clarissa Cavallina, Roberta Ghignoni, Michele Margheriti and Chiara Pazzagli
- 75** ***The Development of Instruments to Detect Indicators of Behavioral Changes in Therapeutic Communities: A Clinical Case Study***
Stefania Cristofanelli, Agata Ando' and Laura Ferro
- 82** ***Effectiveness of Brief Psychodynamic Therapy With Children and Adolescents: An Outcome Study***
Michela Gatta, Marina Miscioscia, Lorenza Svanellini, Andrea Spoto, Manuela Difronzo, Maxim de Sauma and Emilia Ferruzza
- 93** ***Predictive and Incremental Validity of Parental Representations During Pregnancy on Child Attachment***
Renata Tambelli, Cristina Trentini and Francesco Dentale



Mothers' Depression, Anxiety, and Mental Representations After Preterm Birth: A Study During the Infant's Hospitalization in a Neonatal Intensive Care Unit

Carmen Trumello¹, Carla Candelori¹, Marika Cofini¹, Silvia Cimino², Luca Cerniglia³, Marinella Paciello³ and Alessandra Babore^{1*}

¹ Department of Psychological, Health and Territorial Sciences, Università degli studi G.D'Annunzio Chieti Pescara, Chieti, Italy; ² Department of Dynamic and Clinical Psychology, Faculty of Psychology, Sapienza University of Rome, Rome, Italy; ³ Università Telematica Internazionale Uninettuno, Rome, Italy

OPEN ACCESS

Edited by:

Silvia Salcuni,
Università Degli Studi di Padova, Italy

Reviewed by:

Osman Sabuncuoglu,
Marmara University, Turkey
Andrew Leung Luk,
Nethersole Institute of Continuing
Holistic Health Education (NICHE),
Hong Kong

*Correspondence:

Alessandra Babore
a.babore@unich.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 17 September 2018

Accepted: 22 November 2018

Published: 07 December 2018

Citation:

Trumello C, Candelori C, Cofini M,
Cimino S, Cerniglia L, Paciello M and
Babore A (2018) Mothers'
Depression, Anxiety, and Mental
Representations After Preterm Birth: A
Study During the Infant's
Hospitalization in a Neonatal Intensive
Care Unit. *Front. Public Health* 6:359.
doi: 10.3389/fpubh.2018.00359

Aim: This paper aimed to explore psychological functioning and mental representations in mothers of preterm infants during the child's hospitalization in a Neonatal intensive care unit (NICU).

Methods: A sample including 62 mothers of premature infants (gestational age < 37 weeks) was recruited in a NICU. According to the gestational age at the time of delivery, we considered two groups: Group A included mothers whose children were born before 32 weeks of pregnancy; Group B included mothers whose children were born at or after 32 weeks of pregnancy.

Within one week of childbirth, mothers were administered two self-report questionnaires: the Edinburgh Postnatal Depression Scale (EPDS) and the State-Trait Anxiety Inventory (STAI). When their infants' medical conditions became stable, the Clinical Interview for Parents of High-Risk Infants (CLIP) was administered to mothers.

Results: The results showed high levels of depression and anxiety in both groups of mothers, with higher state anxiety scores in Group A than Group B. Besides, a series of hierarchical regression analyses were conducted with STAI, EPDS, and gestational age as predictors on the CLIP scores. Results indicated that EPDS scores predicted CLIP scores on parental self-image, support system, and readiness for discharge ($p < 0.001$); moreover, the interaction among depression, anxiety, and gestational age predicted the CLIP dimension of feeling of mutual recognition ($p < 0.005$).

Conclusions: These findings suggested that a premature birth and the child's hospitalization might exert a negative effect on the mothers' emotional state, their perception of parental self-image and, consequently, the early bond with the child—independent from the infants' gestational age at the time of the preterm delivery.

The data underlined the importance of involving NICU nurses and clinicians in order to optimize the care for mothers immediately after the preterm birth and during the infant's hospitalization, taking into account psychological needs of mothers of both very preterm and moderately preterm infants.

Keywords: neonatal intensive care unit, mothers, prematurity, maternal representations, depression, anxiety

INTRODUCTION

Preterm birth is an important issue in public health and is a major part of worldwide neonatal mortality and morbidity (1). Research has shown that premature birth is a distressing event for parents that often report symptoms of post-traumatic stress for several years (2, 3). Latva et al. (4) have shown that even 5 or 6 years after the preterm birth, mothers might have negative views of their perinatal or postnatal period. Otherwise, it is reported that mothers with positive experiences after a preterm birth have a more effective mother-child communication than those mothers who have had negative experiences (5). Parents of preterm infants face various difficulties and sudden changes in the process of bonding with their baby. Bonding with infants begins before birth and develops after it, but if the birth occurs sooner than expected or even too early, the normal bonding process could be affected. Goldberg and Divitto (6) have demonstrated that a long stay in hospital might have a disturbing effect on the bonding process. Although in the last decade the Neonatal Intensive Care Units (NICU) have undergone some changes for facilitating the presence of parents during the hospitalization of their baby, NICU remains a stressful environment for parents, as demonstrated in many studies (7). The physical environment is characterized by monitoring equipment, tubes and wires connected to infant, noises, and chemical scents. However, the major stress experienced by parents is related to the separation from their baby and to the loss of their parental role as they had previously imagined it. As suggested by Flacking et al. (8), the feelings of separation and exclusion could be related to the lack of physical and emotional closeness which are important factors in the early relationship between parents and the newborn infant. In fact, as frequently reported in the literature, the first moments of postpartum period are fundamental for the construction of early parent-infant bonding (9, 10). During hospitalization of their baby, mothers may experience several and often contradictory emotional reactions, such as grief, sadness, guilt, fear, anger, loss of self-esteem, and sense of failure (11). In fact, this situation can be so overwhelming for mothers that they might react by emotionally distancing themselves from their children (12, 13). These emotional factors might negatively affect the mothers' ideas, thoughts, and representations about the child's appearance and behavior. In particular, mothers of preterm babies often have fewer positive ideas and expectations for their children than mothers of term babies (14, 15); these could be characterized by a

communication about their child, generally positive, with specific and sensitive details about care (16). Crawford and Benoit's work (17) has shown that maternal representations could be influenced so much by traumatic events that the parent might become incapable of understanding their child's state of mind. So, when the child makes signals or expresses desires or needs, the parent might be unable to respond in a caring and appropriate way (18). As Deklyen and Greenberg's research (19) indicated, when this occurs, it constitutes a severe risk factor for mother-child relationship and for later psychopathology. Hall et al. (20) have shown that mothers, characterized by negative and unrealistic perceptions about their baby and the hospital environment, are often more intrusive, more withdrawn, and less sensitive toward the 6-month-old infants. In light of the aforementioned factors that might negatively affect the early postpartum period—considered the “sensitive time” (10) for mother-child bonding—it is very important to explore the mothers' emotional experience after a premature birth and during the hospitalization in the NICU. For this purpose, a useful tool that specifically explores parents' experience in NICU is the Clinical Interview for Parents of High-Risk Infants [CLIP; (21)]. The CLIP allows parents to reflect on and express their feelings and concerns; it could be useful to analyze the maternal representations after a preterm delivery and to detect early disruptions in the mother-infant relationship at the nursery (5, 22). Several studies have investigated the psychological symptoms in mothers of premature infants in terms of the symptoms of depression and anxiety. In fact, mothers of premature infants generally show higher rates of postpartum depression than mothers of full-term infants (23, 24). In literature, there is a broad consensus that early depressive symptoms of mothers have a negative effect on their relationship with the infant and on their parenting role, especially after a preterm birth (25). Mothers with depressive symptoms show negative perceptions of themselves, their baby, and their relationship (26, 27). Although most studies about the effects of mothers' postnatal mood on child development focus above all on postpartum depression, in the last decades, researchers have found that postpartum anxiety has independent effects, just as postpartum depression (28). In case of premature birth, mothers show high levels of anxiety symptoms (24, 29) that might compromise the maternal functions and the mother-infant interactions (30, 31). Besides, as Lotterman et al. (32) noticed in their recent study, a lot of research that explores psychological symptoms (including depression and anxiety) and the experience of mothers with premature infants in NICU, focuses mainly on very preterm gestational age range. Compared to this field of research, studies on moderate-to late preterm infants are less, although this gestational age range characterizes

Abbreviations: CLIP, Clinical Interview for Parents of High-Risk Infants; EPDS, Edinburgh Postnatal Depression Scale; NICU, Neonatal Intensive Care Unit; STAI, State-Trait Anxiety Inventory.

a high percentage of preterm births. Moreover, as far as we know, a few studies have compared maternal representations of moderately preterm and very preterm infants in the NICU during the first moments after birth. Despite the outcomes of very preterm birth are increasingly acknowledged, less attention is given to parents of moderately preterm infants. Furthermore, it remains unclear which specific factors could be most predictive of the quality of maternal representation in the NICU. Starting from the above considerations, our study aimed to more deeply explore the maternal and emotional experience in terms of mental representations, as reflected in the CLIP interview, considering depression, anxiety symptoms, and gestational age at the time of delivery.

MATERIALS AND METHODS

Objectives

This paper overall aimed to explore differences in psychological functioning and mental representations of the infant and themselves as parents between mothers of moderately preterm infants and mothers of very preterm infants. In order to differentiate the two groups, we have referred to recent research that set the turning point at 32 weeks of gestational age (33, 34).

In particular, the current study considered two groups: Group A included mothers whose children were born before 32 weeks of pregnancy (very preterm); Group B included mothers whose children were born at or after 32 weeks of pregnancy (moderately preterm). The study had the following specific objectives:

- To verify whether Group A and Group B differ with regards to the possible presence of anxiety and depressive symptoms in mothers;
- To verify whether Group A and Group B differ with regards to the mothers' representations about the delivery and their relationship with the premature child;
- To verify whether the mothers' anxiety and depressive symptoms predict the quality of their representations of the child and of themselves as parents, considering gestational age.

Participants

Our study is part of a longitudinal project in which mothers and fathers of preterm infants were followed since the hospitalization in NICU till up to 2 years post-partum.

The participants were 62 mothers of preterm babies born before 37 weeks of gestation recruited in NICU of the Chieti University Hospital with the Director's, pediatricians', and nurses' collaboration. Inclusion criteria were: absence of child's genetic illnesses, neonatal deformities, and neurological damages clinically identifiable at birth, mother's age at least 18-year-old, mother's good knowledge of the Italian language, and absence of mother's drug or alcohol addiction.

Maternal and infants' basic characteristics are shown in **Table 1**. All parents were Caucasian and most (79%) were of middle socio-economic status [SES; (35)]. A majority (95%, $N = 59$) of the parents lived together, 80.6% ($N = 50$) of the mothers were employed, and 69.4% ($N = 43$) of the children were

TABLE 1 | Maternal and infant characteristics at NICU ($N = 62$).

Characteristics	Frequency (%)	<i>M</i>	<i>SD</i>
MOTHERS			
Age		33.98	4.76
Education (Years)		14.62	3.30
Middle school	8 (13.6%)		
High school	34 (54.6%)		
University	20 (31.8%)		
Maternity			
Primipara	43 (69.4%)		
Multipara	19 (30.6%)		
Currently Employed			
Yes	50 (80.6%)		
No	12 (19.4%)		
Marital Status			
Married or cohabitating	59 (95%)		
Not married or cohabitating	3 (5%)		
INFANTS			
Gender			
Male	28 (45%)		
Female	34 (55%)		
Gestational Age (In Weeks)		32.28	2.352
< 32 weeks	40 (35.5%)		
≥ 32 weeks	22 (64.5%)		
Birth weight (gr)		1685.42	525.394

firstborn. The mean age of the mothers was 33.98 years (standard deviation [*sd*] = 4.76). The children were 45% ($N = 28$) males and 55% ($N = 34$) females.

Procedures and Measures

Within one week after the childbirth, a group of trained psychologists administered the mothers a demographical and anamnestic form and two self-report questionnaires: Edinburgh Postnatal Depression Scale [EPDS, (36)], State-Trait Anxiety Inventory [STAI, (37)].

The EPDS is a uni-dimensional self-reported checklist, designed as a screening tool for identifying mothers at risk for post-partum depression in community settings. Subjects were asked to rate their symptoms in the past seven days on one of four response categories ranging from "0" = "not at all" to "3" = "most of the time/quite often." The possible scores, after reversing all positive-worded items, ranged from 0 to 30 with a higher score reflecting a higher risk for post-partum depression (PPD). In the present paper, we used the Italian validated version and its related cut-off, i.e., 8/9 (38).

The STAI is a self-report anxiety behavioral instrument consisting of two separate 20-item subscales that measure trait (baseline) and state (situational) anxiety in adults. The STAI trait subscale measures relatively stable individual differences in their proneness to anxiety (i.e., differences in the tendency to experience anxiety), and the STAI state subscale measures transitory anxiety state (i.e., subjective feelings of apprehension,

tension, and worry that vary in intensity and fluctuate based on the situation). In this paper, we used the Italian validated version and its related cut-off, i.e., 39/40 (39).

For the second step, when the infants' medical conditions were stable, a clinical interview [CLIP, (21)] was administered to the mothers by a second group of psychologists who were blind to its administration and the results of self-report questionnaires.

The CLIP was originally developed by the authors to assess the feelings and perceptions of preterm children's parents. It consists of a semi-structured interview allowing the clinician to extensively explore the parental experience. Further, its flexibility allows the clinician to adapt the questions according to the conversational flow, to better explore the parent's emotional experience. This interview requires about 1 h to be completed and addresses eight main areas: infant's current condition, pregnancy course, labor and delivery, relationship with the baby and feelings as a parent, reactions to NICU environment and staff, relationship with the family and social support, discharge and beyond, and a final wrapping up.

The CLIP is audio-recorded and transcribed verbatim; the authors recommended coding the interview through a content analysis; afterwards, Keren et al. (5) developed a coding system to analyze two areas: "readiness for parenthood" and "parental rejection."

Clinical interviews were administered in an empathetic and understanding environment. The interviews lasted an average of 1 h and were audio-recorded with the mothers' permission and subsequently transcribed verbatim, as previously indicated by the authors.

After administering all the measures, two sub-groups were created on the basis of gestational age (33, 34, 40, 41): Group A (*very preterm*) included mothers whose children were born between 28 and 31 weeks; Group B (*moderately preterm*) included mothers whose children were born between 32 and 36 weeks of pregnancy.

Participation in the study was voluntary. All the participants received a letter containing detailed information on the main aims of the study and signed a written informed consent. The questionnaires were alphanumerically coded in order to guarantee anonymity. In the current observational study any diagnostic process was performed; in addition, it involved women who had no history or ongoing evidence of any psychiatric illness; hence, we believe that the approval of the study by the Ethics Committee was not appropriate. Nevertheless, an additional opinion was asked to the Psychological Review Board of our Department. The Board found that all the employed procedures and measures were fully compliant with the Ethics Code of the Italian Board of Psychology—the national authority that provides ethical guidelines for research and clinical practice.

Data Analysis

Descriptive analyses attested that all variables were normally distributed. The analyses of variance (ANOVAs) were used to test significant differences between Group A and Group B scores on STAI, EPDS, and CLIP, and Bonferroni's *post hoc* tests were applied. The calculated *p*-values are reported with their respective *F* statistics and degrees of freedom (*df*), with

TABLE 2 | Mean scores and standard deviations [M(sd)] values of STAI-Y1, STAI-Y2 and EPDS in Group A and Group B.

	STAI-Y1	STAI-Y2	EPDS
Group A	48.55 (13.68)	38.27 (8.64)	13.05 (5.25)
Group B	42.85 (12.69)	37.21 (10.36)	11.33 (5.78)
<i>p</i>	<0.01	n.s	n.s

values < 0.05 being considered significant. Mean values are reported with standard deviations (*sd_s*). Finally, a series of hierarchical regression analyses were conducted to investigate the influence of specific anxious and depressive symptoms (STAI and EPDS) on the mothers' representations about the delivery and their relationship with the premature child (CLIP). In all the analyses we conducted, the child's gender and mothers' age showed no significant effect on the variables. All analyses were performed on the SPSS software (Version 18.0).

RESULTS

Differences in Group A and Group B Scores on the Symptoms of Anxiety and Depression

An ANOVA conducted on Group A and Group B scores on STAI-Y1 showed a group effect [$F_{(1,60)} = 7.418$; $p < 0.01$]. *Post-hoc* analysis showed that Group A has significantly higher scores than Group B on STAI-Y1 (State Anxiety) ($p < 0.01$); 72% of the subjects in Group A and 45% in Group B exceeded the clinical cut-off for STAI-Y1 for the Italian population (39).

An ANOVA conducted on Group A and Group B scores on STAI-Y2 showed no group effect [$F_{(1,60)} = 0.647$; $p > 0.5$]. Although no statistically significant differences were found between the two groups on STAI-Y2 (Trait Anxiety), 36% of subjects in Group A, and 37.5% in Group B exceeded the clinical cut-off for STAI-Y2 for the Italian population (39).

An ANOVA conducted on Group A and Group B scores on EPDS showed no group effect [$F_{(1,60)} = 0.66$; $p > 0.5$]. Although no statistically significant differences were found between the two groups on EPDS, 68% of subjects in Group A and 60% in Group B exceeded the clinical cut-off for EPDS for Italian population (38).

Table 2 shows mean scores and standard deviations values.

Differences in Group A and Group B Scores on the Mothers' Representations About the Delivery and Their Relationship With the Premature Child

An ANOVA conducted on Group A and Group B scores on CLIP showed a group effect on several dimensions ($p < 0.05$). *Post-hoc* analysis showed that Group A had significantly higher scores than Group B on CLIP dimension of: perceived infant's current condition ($F_{(1,60)} = 0.016$; $p < 0.05$), first feelings toward baby ($F_{(1,60)} = 0.035$; $p < 0.05$), readiness for discharge ($F_{(1,60)} = 0.003$; $p < 0.05$), and organization of content ($F_{(1,60)} = 0.016$; $p < 0.05$). No other statistically significant

TABLE 3 | Mean scores, standard deviations and *p*-values on CLIP main areas and subscales in Group A and Group B.

CLIP main area	CLIP subscale	Group A	Group B	<i>p</i>
Infant's current condition		0.68 (1.68)	0.35 (0.70)	<0.05
Pregnancy	First reaction to pregnancy	1.32 (0.65)	1.18 (0.45)	n.s
	Planned pregnancy	1.45 (0.51)	1.38 (0.49)	n.s
Course of pregnancy	Physical and/or emotional complications	2.05 (1.13)	2.48 (1.24)	n.s
	Timing of "pregnancy feeling real"	2.14 (1.11)	1.97 (1.12)	n.s
Labor and delivery	Readiness for delivery	2.45 (0.60)	2.41 (0.64)	n.s
	Fear of loss during delivery	2.32 (0.65)	2.05 (0.57)	n.s
Relationship with baby and feelings as a parent	First feelings toward baby	1.55 (0.60)	1.20 (0.41)	<0.05
	Present feelings toward baby	1.33 (0.48)	1.15 (0.36)	n.s
	Feeling of mutual recognition	1.52 (0.68)	1.46 (0.55)	n.s
	Parental self-image	1.33 (0.58)	1.33 (0.53)	n.s
	Reaction to staff	1.43 (0.51)	1.32 (0.53)	n.s
Reaction to NICU	Reaction to NICU setting	1.67 (0.62)	1.93 (0.92)	n.s
		1.32(0.48)	1.30 (0.46)	n.s
Support system		1.50 (0.67)	1.23 (0.43)	n.s
Discharge and beyond	Foreseen future for baby			
	Readiness for discharge	1.70 (0.70)	1.24 (0.43)	<0.05
Affect		1.68(0.65)	1.53 (0.56)	n.s
Organization of content		1.36(0.58)	1.26 (0.44)	<0.05
Richness of content		1.62(0.59)	1.46 (0.60)	n.s

difference was found on the other CLIP subscales ($p > 0.5$). **Table 3** shows mean scores and standard deviations values.

Impact of Mothers' Anxiety and Depressive Symptoms on the Quality of Their Representations of the Child and of Themselves as Parents, With Respect to the Gestational Age

A series of hierarchical regressions have been conducted with STAI, EPDS, and gestational age as predictors on the CLIP scores. The results showed that EPDS scores predicted CLIP scores on parental self-image, support system, and readiness for discharge ($p < 0.01$); gestational age predicts scores on the CLIP main area of course of pregnancy ($p < 0.05$); STAI-Y1 scores, interacting with gestational age, predict the CLIP main area of affect ($p < 0.01$). EPDS, interacting with STAI-Y1, STAI-Y2 scores, and gestational age, predict the CLIP subscale scores of feeling of mutual recognition ($p < 0.05$).

Table 4 shows results and values of the regression analyses (significant results only).

DISCUSSION

Premature delivery and the subsequent hospitalization in NICU are considered early adverse experiences, which could affect

TABLE 4 | Results and values of the regression analyses (significant results).

STAI/EPDS/gestational age	CLIP main areas and subscales			
	R ²	β	t	p
EPDS	Parental self-image			
	0.061	0.671	29.431	<0.001
	Support system			
	0.031	0.767	32.123	<0.001
Gestational age	Readiness for discharge			
	0.045	0.369	3.475	<0.001
	Course of pregnancy			
	0.069	0.537	2.465	<0.05
STAI-Y1 • gestational age	Affect			
	0.052	0.613	2.324	<0.001
EPDS • STAI-Y1 • STAI-Y2 • gestational age	Feeling of mutual recognition			
	0.089	0.413	2.328	<0.005

• Scores in association with.

the emotive states of mothers, their mental representations, their perceptions of infants, and their relationship in the early postpartum moments, that are assumed to be significant for maternal bonding to the infant.

Our study aimed to explore the maternal emotional states in NICU, with reference to anxiety and depressive symptoms, mental representations, and gestational age at the time of delivery.

With regard to the first aim, results showed that mothers of premature babies experience high levels of psychological distress in both the investigated groups, namely very preterm (Group A) and moderately preterm (Group B) children.

In reference to symptoms of anxiety, the mothers' scores significantly differed between the two groups. More specifically, the State Anxiety seemed to be the only one influenced by the baby's gestational age, in fact mothers in Group A showed higher anxiety levels than those in Group B.

These findings are consistent with the previous studies reporting that mothers of very preterm infants may be more concerned and worried about their babies' survival as compared to those of moderately preterm infants (42, 43).

On the contrary, there are no differences in Trait Anxiety levels when the two groups were compared, despite a large number of mothers of the whole sample exceeding the clinical cut-off for the Italian population (39). This result is in line with other ones that highlight elevated anxiety symptoms following a premature delivery (44, 45). An alternative explanation of the high levels of state anxiety in our sample may not exclude a post-traumatic state of the mothers, following the very preterm delivery. In fact, several recent studies found that posttraumatic stress represented the most common reactions after a premature childbirth (46, 47). However, this hypothesis could be more suitably explored in future research using the STAI alongside with other more specific tools for post-traumatic stress disorder.

If we move to consider depressive symptoms, contrary to general expectations, we do not find significant differences

between the two groups, despite a high percentage of mothers exceeding the clinical cut-off for EPDS for the Italian population (38), regardless of the gestational age at the time of delivery. In our sample, during the infant's NICU hospitalization, maternal depressive symptoms in both the groups were equally elevated which was in line with other studies (48–51).

We may hypothesize that, in case of preterm birth, the precarious conditions of the child, the cold and sterile environment of the NICU, and the ambiguity of maternal role in the hospital setting make the mothers more vulnerable to depressive symptoms, even in the case of moderately preterm infants.

The mothers' feelings of helplessness, exclusion, and alienation could further increase the level of distress and might thus impact their transition to motherhood (52, 53). In fact, previous studies showed that the prevalence of postpartum depression after premature delivery can be estimated up to 70% (54–56).

Our finding of higher levels of anxiety and depressive symptoms in mothers of preterm infants is consistent with other research that explored the distress in mothers of premature infants as compared to mothers of full-term infants (31, 57, 58).

In the literature, few studies have examined the level of symptoms immediately after birth or during NICU hospitalization. The current study has estimated maternal symptomatology during the infant's hospitalization, 1 week after delivery. Our results showed that beyond the infant's gestational age, mothers present a high risk of anxious and depressive symptomatology. Therefore, it could be important to pay close attention to mothers' emotional experiences related to premature birth since the first moments after delivery.

Since the first contact between a mother and her child takes place inside the NICU, it is very important to provide the mothers with psychological support or assistance right from birth in order to ensure their well-being and prevent future problems.

Another purpose of this research was to deeply explore the maternal representations during the NICU stay. More specifically, with regard to the second aim, mothers of very preterm infants differ from mothers of moderately preterm infants only in four areas of maternal representations, as reflected in the CLIP. Specifically, as compared to the mothers of moderately preterm infants, mothers of very preterm babies showed more negative experiences and perceptions relating to their infants and their relationship with them. In fact, these mothers were characterized by a greater "fear of loss of the baby" (a dimension related to the area of maternal perception of the child's current condition) and more negative "first feelings toward the baby." Additionally, they did not feel ready for discharge and the narratives of their representations were disorganized.

These major difficulties of mothers of very preterm children in the narrative organization of representations, their negative feelings toward the infant, and the low confidence in their role could be related to the perception of greater vulnerability of their baby, that increases their fear of loss (59). Seeing their infants as fragile and in danger in the NICU is very stressful for mothers, and it may generate an "emotive crisis" (7, 60).

The mothers of preterm infants often show feelings of ambivalence about their relationship with their child and feelings of unreality of "being mothers" during the NICU stay (61). In fact, in the case of very preterm infants, mothers spend more time in the NICU, where they are continuously in touch with the experience of the infants' fragility and risk of mortality (62). Living in a state of psychological and physical separation from their babies is intensified by the artificial environment of the NICU. All these early and difficult experiences could affect the development of maternal mental representations.

Finally, in reference to the third objective of the study, according to our results, depressive symptoms were the strongest predictors of the quality of maternal representations of the child and of themselves as mothers and of the child. In particular, depression seemed to predict more areas of representations with respect to the other variables we had considered. It predicted an insecure parental self-image, negative perception of support system, and lower readiness for discharge (this last area investigated the mothers' impression and expectations about homecoming and the baby's future development).

Generally, premature birth is considered a stressful and potentially traumatizing event (63) followed by the hospitalization in the NICU, where there is a prolonged separation between the mother and the infant. This situation might generate feelings of depression and the mothers' poorer psychological well-being which may lead to lesser psychological investment in relationship with the infant (15) and altered perception of both the mothers' parental role and the support system.

In addition, our findings showed that depressive symptoms, in interaction with anxiety (Trait and State) and gestational age, predict the CLIP area "feeling of mutual recognition," regarding the mothers' perception of being recognized by their children in their parental role. It could be concluded that in presence of the comorbidity of anxiety and depression, the lower the gestational age at the birth, the less the mothers feel to be recognized by their infants.

As suggested by Feldman (64), close proximity, nurturing, and interaction with the baby play an important role for the early mother-child interaction, consolidating mothers' confidence in her parenting role. In the NICU, these conditions are absent: the early separation between the mothers and their infants, the loss of maternal role (60), the feeling of responsibility for the unhealthy state of the infants (65), and negotiation of the infant's care with nurses and medical staff within the unit (66) are associated with a higher risk of long-term psychological problems, such as depression, anxiety, feelings of isolation, and fear for the child's well-being (67). These emotive and psychological states, with a lower gestational age, that usually requires prolonged hospitalization, seem to influence above all the aspect concerning "recognition" and "reciprocity." In fact, physical closeness represents the prerequisite for early parent-to-infant bonding for maternal behaviors and for reciprocity between the mother and her child (64, 68). These data are in line with other research that underlined that the NICU stay could

hinder the development of the intuitive parental capacities in the mothers of very preterm infants (69, 70).

Further research is needed to explore the mechanism behind the development of maternal representations in the particular situation of premature birth. Indeed, several studies have demonstrated that maternal representations influence the way in which a mother interacts with her baby (71).

Overall, our research highlights some important aspects of mothers' experience and their emotional state in the early moments of the child's life during the hospitalization in NICU in a situation of high risk for the infant.

Nevertheless, our study has some limitations, such as the small sample size and its recruitment in only one NICU; this may limit the generalizability of the results. In addition, we did not consider a comparison group of mothers with full-term children to test depressive and anxiety levels. Hence, future research could try to replicate these findings using larger and more diversified samples, also referring to non-Italian mothers, given the wide cross-cultural variations in maternal reactions to preterm delivery.

However, the present study makes a relevant contribution to knowledge regarding the emotional state of the mothers of premature babies, highlighting a difficult emotional situation not only for the mothers of very preterm babies but also for those of moderately preterm babies. Often, it happens that high-risk mother-infant dyads receive more psychological attention than low-risk ones (5). To improve care, it is very important to also

understand the experiences of these mothers who are at the risk of being neglected. In addition, our study integrated different tools (questionnaires and interviews) and the use of a clinical interview tool—the CLIP—built specifically for parents of premature babies, that allowed us to extensively analyze maternal representations, retracing the path from pregnancy to experience in NICU with the mothers. Undeniably, not prematurity in itself but the presence of certain emotive states, negative thoughts, and perceptions in parents might be indicative of the difficulties in parent-infant relationship (72).

Parenting interventions in the NICUs play an important role in facilitating the bonding between the mother and the infant, providing support for these vulnerable families. Benzies et al. (73), in their meta-analysis, showed that early interventions in NICU decreased maternal anxiety and depressive symptoms and increased the mothers' sense of self-efficacy.

In fact, although NICU's primary function is medical assistance for infants, it is also the place where there is the first mother-child encounter and where all the early dynamics of their relationship begin. For this reason, it is crucial to conduct further research in this area.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

REFERENCES

- WHO. March of Dimes, PMnCH, Save the Children. In: Howson CP, Kinney MV, Lawn JE, editors. *Born Too Soon: The Global Action Report on Preterm birth*. Geneva, Switzerland: World Health Organization (2012). p. 1–124.
- Jotzo M, Poets CF. Helping parents cope with trauma of premature birth: an evaluation of a trauma-preventive psychological intervention. *Pediatrics* (2005) 115:915–9. doi: 10.1542/peds.2004-0370
- Karatzias A, Chouliara Z, Maxton F, Freer Y, Power, F. Post-traumatic symptomatology in parents with premature infants: a systematic review of the literature. *J Prenatal Perinatal Psychol Health* (2007) 3:249–60.
- Latva R, Korja R, Salmelin LL, Tamminen T. How is maternal recollection of the birth experience related to the behavioral and emotional outcome of preterm infants? *Early Hum Dev.* (2008) 84:587–94. doi: 10.1016/j.earlhumdev.2008.02.002
- Keren M, Feldman R, Eidelman AI, Sirota L, Lester B. Clinical interview for high-risk parents of premature infants (CLiP) as a predictor of early disruptions in the mother-infant relationship at the nursery. *Infant Mental Health J.* (2003) 24:93–110. doi: 10.1002/imhj.10049
- Goldberg S, Divitto B. Parenting children born preterm. In: Bornstein MD, editor. *Handbook of parenting*. Mahwah, NJ: Erlbaum (2002). p. 329–54.
- Franck LS, Cox S, Allen A, Winter I. Measuring neonatal intensive care unit-related parental stress. *J Adv Nurs.* (2005) 49:608–15. doi: 10.1111/j.1365-2648.2004.03336.x
- Flacking R, Lehtonen L, Thomson G, Axelin A, Ahlqvist S, Moran VH, et al. Closeness and separation in neonatal intensive care. *Acta Paediatr.* (2012) 101:1032–7. doi: 10.1111/j.1651-2227.2012.02787.x
- Klaus MH, Kennell JH, Klaus PH. *Bonding: Building the Foundations of Secure Attachment and Independence*. U.S: A Merloyd Lawrence Book/ Addison-Wesley Publishing Company (1995).
- Feldman R. Sensitive periods in human social development: New insights from research on oxytocin, synchrony, and high-risk parenting. *Dev Psychopathol.* (2015) 27:369–95. doi: 10.1017/S0954579415000048
- Miles MS, Holditch-Davis D. Parenting the prematurely born child: pathways of influence. *Semi Perinatol.* (1997) 21:254–66. doi: 10.1016/S0146-0005(97)80067-5
- Müller-Nix C, Ansermet F. Prematurity risk factors and protective factors. In: Zeanah CH, editor. *Handbook of Infant Mental Health*. New York, NY: The Guilford Press (2009). p. 180–96.
- Shah PE, Clements M, Poehlmann J. Maternal resolution of grief after preterm birth: implications for infant attachment security. *Pediatrics* (2011) 127:284–92. doi: 10.1542/peds.2010-1080
- Borghini A, Pierrehumbert B, Miljkovitch R, Muller-Nix C, Forcada-Geux, M, Ansermet, F. Mother's attachment representations of their premature infant at 6 and 18 months after birth. *Infant Mental Health J.* (2006) 27:494–508. doi: 10.1002/imhj.20103
- Forcada-Guex M, Borghini A, Pierrehumbert B, Ansermet F, Müller-nix C. Prematurity, maternal posttraumatic stress and consequences on the mother-infant relationship. *Early Hum Dev.* (2011) 87: 21–26. doi: 10.1016/j.earlhumdev.2010.09.006
- Tooten, A. *First Connections. The Impact of Preterm Birth on Mothers and Fathers*. Dissertation's thesis. Tilburg University (2014).
- Crawford A, Benoit D. Caregivers' disrupted representations of the unborn child predicts later infant-caregiver disorganized attachment and disrupted interactions. *Infant Mental Health J.* (2009) 30:124–44. doi: 10.1002/imhj.20207
- Rollé L, Prino LE, Sechi C, Vismara L, Neri E, Polizzi C, et al. Parenting stress, mental health, dyadic adjustment: a structural equation model. *Front Psychol.* (2017) 8:839. doi: 10.3389/fpsyg.2017.00839
- Deklyen M, Greenberg MT. Attachment and psychopathology in childhood. In: Cassidy J, Shaver PR. *Handbook of Attachment: Theory, Research and Clinical Applications*. New York, NY: The Guilford Press (2008). p. 637–65.

20. Hall RA, Hoffenkamp HN, Tooten, A, Braeken J, Vingerhoets AJ, van Bakel HJ. Longitudinal associations between maternal disrupted representations, maternal interactive behavior and infant attachment: a comparison between full-term and preterm dyads. *Child Psychiatry Hum Dev.* (2015) 46:320–31. doi: 10.1007/s10578-014-0473-3
21. Meyer EC, Zeanah CH, Boukydis CFZ, Lester BM. A clinical interview for parents of high-risk infants: concept and applications. *Infant Mental Health J.* (1993) 14:192–207. doi: 10.1002/1097-0355(199323)14:3<192::AID-IMHJ2280140305>3.0.CO;2-R.
22. Candelori C, Trumello C, Babore A, Keren M, Romanelli R. The experience of premature birth for fathers: the application of the clinical interview for parents of high-risk infants (CLIP) to an Italian sample. *Front Psychol.* (2015) 6:1444. doi: 10.3389/fpsyg.2015.01444
23. Beck CT. Recognizing and screening for postpartum depression in mothers of NICU infants. *Adv Neonatal Care* (2003) 3:37–46. doi: 10.1053/adnc.2003.50013
24. Lefkowitz DS, Baxt C, Evans JR. Prevalence and correlates of posttraumatic stress and postpartum depression in parents of infants in the neonatal intensive care unit (NICU). *J Clin Psychol Med Settings.* (2010) 17:230–7. doi: 10.1007/s10880-010-9202-7
25. Moehler E, Brunner R, Wiebel A, Reck C, Resch F. Maternal depressive symptoms in the postnatal period are associated with long-term impairment of mother-child bonding. *Arch Women's Mental Health* (2006) 9:273–8. doi: 10.1007/s00737-006-0149-5
26. Ahlqvist-Björkroth S. *Challenges for the Transition into Early Parenthood: Prenatal Depressive Symptoms, Marital Distress, and the Premature Birth of an Infant.* Dissertation's thesis. Turku: University of Turku (2017).
27. Vismara L, Rollè L, Agostini F, Sechi C, Fenaroli V, Molgora S, et al. Perinatal parenting stress, anxiety, and depression outcomes in first-time mothers and fathers: a 3- to 6-months postpartum follow-up study. *Front Psychol.* (2016) 7:938. doi: 10.3389/fpsyg.2016.00938
28. Field T. Postnatal anxiety prevalence, predictors and effects on development: A narrative review. *Infant Behav Dev.* (2018) 51:24–32. doi: 10.1016/j.infbeh.2018.02.005
29. Feeley N, Zelkowitz P, Cormier C, Charbonneau L, Lacroix A, Papageorgiou A. Posttraumatic stress among mothers of very low birthweight infants at 6 months after discharge from the neonatal intensive care unit. *Appl Nurs Res.* (2011) 24:114–7. doi: 10.1016/j.apnr.2009.04.004
30. Schmücker G, Brisch KH, Köhntop B, Betzler S, Österle M, Pohlandt F, et al. The influence of prematurity, maternal anxiety, and infants' neurobiological risk on mother–infant interactions. *Infant Mental Health J.* (2005) 26:423–41. doi: 10.1002/imhj.20066
31. Brandon DH, Tully KP, Silva SG, Malcolm WF, Murtha AP, Turner BS, et al. Emotional Responses of Mothers of Late-Preterm and Term Infants. *J Obstet, Gynecol Neonatal Nurs.* (2011) 40:719–31. doi: 10.1111/j.1552-6909.2011.01290.x
32. Lotterman JH, John M, Lorenz HM, Bonanno GA. You Can't Take Your Baby Home Yet: a longitudinal study of psychological symptoms in mothers of infants hospitalized in the NICU. *J Clin Psychol Med Settings* (2018) doi: 10.1007/s10880-018-9570-y. [Epub ahead of print].
33. Nordvall-Lassen M, Hegaard HK, Obel C, Lindhard MS, Hedegaard M, Henriksen TB. Leisure time physical activity in 9- to 11-year-old children born moderately preterm: a cohort study. *BMC Pediatrics* (2018) 18:163. doi: 10.1186/s12887-018-1141-8
34. Taine M, Charles MA, Beltrand J, Rozé JC, Léger J, et al. Early postnatal growth and neurodevelopment in children born moderately preterm or small for gestational age at term: a systematic review. *Paediatr Perinatal Epidemiol.* (2018) 32:268–80. doi: 10.1111/ppe.12468
35. Hollingshead AA. *Four-Factor Index of Social Status.* New Haven, CT: Yale University (1975).
36. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item edinburgh postnatal depression scale. *Br J Psychiatry* (1987) 150:782–6. doi: 10.1192/bjp.150.6.782
37. Spielberger CD, Gorsuch RL, Lushene RL. *Manual for the State-Trait Anxiety Inventory: STAI (Self-evaluation Questionnaire).* Palo Alto, CA: Consulting Psychologist Press. (1970).
38. Benvenuti P, Ferrara M, Niccolai C, Valoriani V, Cox JL. The edinburgh postnatal depression scale: validation for an Italian sample. *J Affect Disord.* (1999) 53:137–41. doi: 10.1016/S0165-0327(98)00102-5
39. Pedrabissi L, Santinello M. *Inventario per l'ansia di Stato e di Tratto: Nuova versione Italiana Dello STAI-forma Y [Manual for the State-Trait Anxiety Inventory: New Italian Version of the STAY-Y form].* Firenze: Organizzazioni Speciali (1989).
40. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. *Lancet* (2008) 371:75–84. doi: 10.1016/S0140-6736(08)60074-4
41. Sansavini A, Guarini A. Nuove prospettive di ricerca nella popolazione dei nati pretermine. In: Sansavini A, Faldella G, editor. *Lo Sviluppo Dei Bambini Nati Pretermine. Aspetti Neuropsicologici, Metodi di Valutazione e Interventi.* Milano: Franco Angeli (2013). p. 27–39.
42. Engle WA, Tomashek KM, Wallman C. The committee on fetus and newborn "Late-preterm" infants: a population at risk. *Pediatrics* (2007) 120:1390–401. doi: 10.1542/peds.2007-2952
43. Shapiro-Mendoza CK, Lackritz EM. Epidemiology of late and moderate preterm birth. *Semi Fetal Neonatal Med.* (2012) 17:120–5. doi: 10.1016/j.siny.2012.01.007
44. Singer LT, Salvator A, Guo S, Collin M, Lilien L, Baley J. Maternal psychological distress and parenting stress after the birth of a very low-birth-weight infant. *J Am Med Assoc.* (1999) 28:799–805. doi: 10.1001/jama.281.9.799
45. Misund AR, Nerdum P, Braten S, Pripp AH, Diseth TH. Long-term risk of mental health problems in women experiencing preterm birth: a longitudinal study of 29 mothers. *Ann Gen Psychiatry* (2013) 12:33. doi: 10.1186/1744-859X-12-33
46. Suttora C, Spinelli M, Monzani D. From prematurity to parenting stress: The mediating role of perinatal post-traumatic stress disorder. *Eur J Dev Psychol.* (2014) 11:478–93. doi: 10.1080/17405629.2013.859574
47. Misund AR, Nerdum P, Diseth TH. Mental health in women experiencing preterm birth. *BMC Pregnancy Childbirth* (2014) 14:263. doi: 10.1186/1471-2393-14-263
48. Mew AM, Holditch-Davis D, Belyea M, Miles MS, Fishel A. Correlates of depressive symptoms in mothers of preterm infants. *Neonatal Network* (2003) 22:51–60. doi: 10.1891/0730-0832.22.5.51
49. Yurdakul Z, Akman I, Kuscü MK, Karabekiroğlu A, Yaylali G, Demir F, et al. Maternal psychological problems associated with neonatal intensive care admission. *Int J Pediatr.* (2009) 591359:7. doi: 10.1155/2009/591359
50. Rogers CE, Kidokoro H, Wallendorf M, Inder TE. Identifying mothers of very preterm infants at-risk for postpartum depression and anxiety before discharge. *J Perinatol.* (2013) 33:171–6. doi: 10.1038/jp.2012.75
51. Vasa R, Eldeirawi K, Kuriakose VG, Nair GJ, Newsom C, Bates J. Postpartum depression in mothers of infants in neonatal intensive care unit: risk factors and management strategies. *Am J Perinatol.* (2014) 31:425–34. doi: 10.1055/s-0033-1352482
52. Chertok IR, McCrone S, Parker D, Leslie N. Review of interventions to reduce stress among mothers of infants in the NICU. *Adv Neonatal Care* (2014) 14:30–7. doi: 10.1097/ANC.0000000000000044
53. Tambelli R, Cerniglia L, Cimino S, Ballarotto G. Parent-infant interactions in families with women diagnosed with postnatal depression: a longitudinal study on the effects of a psychodynamic treatment. *Front Psychol.* (2015) 6:1210. doi: 10.3389/fpsyg.2015.01210
54. Younger JB, Kendell MJ, Pickler RH. Mastery of stress in mothers of preterm infants. *J Soc Pediatr Nurses* (1997) 2:29–35. doi: 10.1111/j.1744-6155.1997.tb00197.x
55. Davis L, Edwards H, Mohay H, Wollin J. The impact of very premature birth on the psychological health of mothers. *Early Hum Dev.* (2003) 73:61–70. doi: 10.1016/S0378-3782(03)00073-2
56. Miles MS, Holditch-Davis D, Scher M, Schwartz T. A longitudinal study of depressive symptoms in mothers of prematurely born infants. *J Dev Behav Pediatrics* (2007) 28:36–44. doi: 10.1097/01.DBP.0000257517.52459.7a
57. Voegtline KM, Stifter CA. The family life project investigators. late-preterm birth, maternal symptomatology, and infant negativity. *Infant Behav Dev.* (2010) 33:545–54. doi: 10.1016/j.inhbeh.2010.07.006
58. Zanardo V, Gambina I, Begley C, Litta P, Cosmi E, Giustardi A, et al. Psychological distress and early lactation performance in

- mothers of late preterm infants. *Early Hum Dev.* (2011) 87:321–3. doi: 10.16/j.earlhumdev.2011.01.035
59. Beck CT, Harrison L. Posttraumatic stress in mothers related to giving birth prematurely: A mixed research synthesis. *J Am Psychiatric Nurs Assoc.* (2017) 23:241–57. doi: 10.1177/1078390317700979
 60. Alkozei A, McMahon E, Lahav A. Stress levels and depressive symptoms in NICU mothers in the early postpartum period. *J Maternal-Fetal Neonatal Med.* (2014) 27:1738–43. doi: 10.3109/14767058.2014.942626
 61. Jackson K, Ternestedt B, Schollin J. From alienation to familiarity: experiences of mothers and fathers of preterm infants. *J Adv Nurs.* (2003) 43:120–9. doi: 10.1046/j.1365-2648.2003.02686.x
 62. Clotey M, Dillard DM. Post-traumatic stress disorder and neonatal intensive care. *Int J Childbirth Edu.* (2013) 28:23–9.
 63. Kersting A, Dorsch M, Wesselmann U, Ludorff K, Witthaut J, Ohrmann P, et al. Maternal posttraumatic stress response after the birth of a very low-birth-weight infant. *J Psychosom Res.* (2004) 57:473–6. doi: 10.1016/j.jpsychores.2004.03.011
 64. Feldman-Winter L, Goldsmith JP, AAP Committee on fetus and newborn, aap task force on sudden infant death syndrome. Safe sleep and skin-to-skin care in the neonatal period for healthy term newborns. *Pediatrics* (2016) 138:e20161889 doi: 10.1542/peds.2016-1889
 65. Kawafha MM. Parental stress in the neonate intensive care unit and its association with parental and infant characteristics. *J Neonatal Nurs.* (2018) 24:266–72. doi: 10.1016/j.jnn.2018.05.005
 66. Lupton D, Fenwick J. 'They've forgotten that I'm the mum': constructing and practising motherhood in special care nurseries. *Social Sci Med.* (2001) 53:1011–21. doi: 10.1016/S0277-9536(00)00396-8
 67. Howe TH, Sheu CF, Wang TN, Hsu YW. Parenting stress in families with very low birth weight preterm infants in early infancy. *Res Dev Disabil.* (2014) 35:1748–56. doi: 10.1016/j.ridd.2014.02.015
 68. Feldman R, Weller A, Leckman JF, Kuint J, Eidelman AI. The nature of the mother's tie to her infant: Maternal bonding under conditions of proximity, separation, and potential loss. *J Child Psychol Psychiatry Allied Discipl.* (1999) 40:929–39. doi: 10.1017/S0021963099004308
 69. Papoušek H, Papoušek M. Intuitive parenting: A dialectic counterpart to the infant's integrative competence. In: Osofsky JD, editor. *Wiley Series on Personality Processes Handbook of Infant Development.* Oxford, England: John Wiley & Sons (1987). p. 669–720.
 70. Guillaume S, Michelin N, Amrani E, Benier B, Durrmeyer X, et al. Parents' expectations of staff in the early bonding process with their premature babies in the intensive care setting: a qualitative multicenter study with 60 parents. *BMC Pediatrics* (2013) 13:18. doi: 10.1186/1471-2431-13-18
 71. Tooten A, Hall RA, Hoffenkamp HN, Braeken J, Vingerhoets AJ, van Bakel HJ. Maternal and paternal infant representations: a comparison between parents of term and preterm infants. *Infant Behav Dev.* (2014) 37:366–79. doi: 10.1016/j.infbeh.2014.05.004
 72. Hoffenkamp HN, Tooten A, Hall RAS, Braeken J, Eliëns MPJ, et al. Effectiveness of hospital-based video interaction guidance on parental interactive behavior, bonding, and stress after preterm birth: a randomized controlled trial. *J Consult Clin Psychol.* (2015) 83:416–29. doi: 10.1037/a0038401
 73. Benzies KM, Magill-Evans JE, Hayden KA, Ballantyne M. Key components of early intervention programs for preterm infants and their parents: a systematic review and meta-analysis. *BMC Pregnancy Childbirth* (2013) 13:S10. doi: 10.1186/1471-2393-13-S1-S10

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2018 Trumello, Candelori, Cofini, Cimino, Cerniglia, Paciello and Babore. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



Gender, Personality Traits and Experience With Psychiatric Patients as Predictors of Stigma in Italian Psychology Students

Leonardo Zaninotto^{1*}, Jia Qian^{2,3}, Yao Sun⁴, Giulia Bassi⁴, Marco Solmi⁵ and Silvia Salcuni⁴

¹ Department of Mental Health, Local Health Unit n. 6 ("Euganea"), Padova, Italy, ² Department of Information Engineering, University of Padova, Padova, Italy, ³ Department of Applied Mathematics and Computer Science, Technical University of Denmark, Kongens Lyngby, Denmark, ⁴ Department of Developmental Psychology and Socialisation, University of Padova, Padova, Italy, ⁵ Department of Neurosciences, University of Padova, Padova, Italy

OPEN ACCESS

Edited by:

Frederick Robert Carrick,
Bedfordshire Centre for Mental Health
Research in association with the
University of Cambridge
(BCMHR-CU), United Kingdom

Reviewed by:

Yuan-Pang Wang,
University of São Paulo, Brazil
Daniel Rossignol,
Rossignol Medical Center,
United States

*Correspondence:

Leonardo Zaninotto
leonardo.zaninotto@aulss6.veneto.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 16 September 2018

Accepted: 26 November 2018

Published: 18 December 2018

Citation:

Zaninotto L, Qian J, Sun Y, Bassi G,
Solmi M and Salcuni S (2018) Gender,
Personality Traits and Experience With
Psychiatric Patients as Predictors of
Stigma in Italian Psychology Students.
Front. Public Health 6:362.
doi: 10.3389/fpubh.2018.00362

A sample of undergraduate Psychology students ($n = 1005$), prevalently females (82.4%), mean age 20.5 (sd 2.5), was examined regarding their attitudes toward people suffering from mental illness. The survey instrument included a brief form for demographic variables, the Attribution Questionnaire-9 (AQ-9), the Ten Items Personality Inventory (TIPI), and two questions exploring attitudes toward open-door and restraint-free policies in Psychiatry. Higher levels of stigmatizing attitudes were found in males (Pity, Blame, Help, and Avoidance) and in those (76.5%) who had never had any experience with psychiatric patients (Danger, Fear, Blame, Segregation, Help, Avoidance and Coercion). A similar trend was also found in those who don't share the policy of no seclusion/restraint, while subjects who are favorable to open-door policies reported higher Coercion scores. No correlations were found between dimensions of stigma and personality traits. A machine learning approach was then used to explore the role of demographic, academic and personality variables as predictors of stigmatizing attitudes. Agreeableness and Extraversion emerged as the most relevant predictors for blaming attitudes, while Emotional Stability and Openness appeared to be the most effective contributors to Anger. Our results confirmed that a training experience in Psychiatry might successfully reduce stigma in Psychology students. Further research, with increased generalizability of samples and more reliable instruments, should address the role of personality traits and gender on attitudes toward people suffering from mental illness.

Keywords: stigma, machine learning, psychology, student, personality

INTRODUCTION

The Canadian sociologist Erving Goffman defined stigma as "the situation of the individual who is disqualified from full social acceptance," and characterized it as a relationship between "an attribute and a stereotype" [(1), p. 9]. In other words, stigma can be defined as a "mark" (attribute) that links a person to undesirable characteristics (stereotypes) (2) producing separation, status loss, and discrimination (3).

There are two main types of stigma against people suffering from mental illness: public stigma and self-stigma (4). Public stigma refers to the attitudes and beliefs held by the general public, while self-stigma occurs when the subjects endorse the negative public

attitudes assigned to them (5). As a consequence of public stigma, people with mental illness suffer from discrimination in many areas of daily life (6, 7), while self-stigma may lead to reluctance to use mental health services (8–10).

Stigmatizing attitudes can also be found among mental health professionals (11–15), leading to poorer consumer's satisfaction (16) and poorer outcomes (17). Another possible source of stigma and a potential barrier against help seeking may be the negative image of Psychiatry deriving from the controversial issues of compulsory treatments and coercive practices. The semantic domain of seclusion and coercion is symbolically represented by the policy of locked doors in acute psychiatric wards, which further potentiates the notion of psychiatric patients as dangerous (18).

Among mental health professionals, psychologists are those who most directly get involved in relationship with the consumer, being also free from the charge of medications and compulsory treatments. Further, since in many contexts patients and caregivers tend to refer to less stigmatizing professionals first (19), psychologists are often regarded as the “front men” of mental health practitioners. Some studies showed that psychologists and psychiatrists might have more negative ratings than the general public on stereotypes, restriction of the individual's rights, and social distance (20, 21). Conversely, when compared to other mental health professionals, psychologists seem to have the lowest scores in negative emotions (anger, perceived dangerousness and fear) and in negative behavioral responses (coercion, segregation, and avoidance) (22).

Exploring possible predictors of stigmatizing attitudes among future professionals, such as Medicine or Psychology students, may be of crucial importance in order to define possible targets for anti-stigma interventions, as their attitudes and beliefs are supposed to be more easily modifiable (23). A growing body of evidence has shown that medical students usually express distancing attitudes toward people with mental illness (23–25), while Psychology students tend to define subjects with serious mental illness as unpredictable, antisocial and dangerous (26).

The primary aim of our study was to adopt Corrigan's (27) attributional model of public discrimination to explore the way undergraduate Psychology students perceive subjects with serious mental illness. Further, since a previous work by our group (28) has evidenced a relationship among professional variables, personality traits and avoidant attitudes toward patients in a sample of mental health professionals, our secondary aim was to apply a similar prediction model to a sample of Psychology students in order to detect possible associations among stigmatizing attitudes and: (a) some demographic and academic variables, and (b) some personality traits.

MATERIALS AND METHODS

Subjects

The Inter-departments Research Ethics Committee of Psychology of the University of Padova approved our research protocol (nr. 2538/2018). The study was questionnaire-based and cross-sectional. The survey was conducted over two academic semesters (fall and spring) during the year 2017–2018, on a sample of undergraduate Psychology students from the

University of Padova¹. At Padova Psychology School there are four different undergraduate programmes: L1, Cognitive Psychology and Psychobiology; L2, Developmental and Educational Psychology; L3, Social and Work Psychology; L4, Psychology of Personality and Interpersonal Relationships. Study participants were enrolled from ten different classes across the three academic years: three classes from the 1st year (L1, L3, L4), three classes from the 2nd year (L1, L3, L4), and four classes from the 3rd year (L1, L2, L3, L4). Two undergraduate students from the L4 program were employed to distribute the questionnaire to each class at the end of a lesson. Classes and lessons were chosen based on previous agreements between the professor and one the authors (SS). Approximately 1060 questionnaires were distributed; of these, 53 (5%) were returned back blank. Data collection was completely anonymous: no personal records about participants were collected, and no information about those who refused to take part in the study was gathered.

The recruitment procedure finally resulted in 1005 participants, prevalently females (82.39%), mean age 20.51 ($SD = 2.50$; range 18–47); all participants were unmarried. A description of the sample is reported in **Table 1**.

Measures

The survey instrument included: a brief demographic form, a short version of the Attribution Questionnaire-27, the Attribution Questionnaire-9 (AQ-9) (29), two dichotomous (i.e., yes/no) Opinion Questions (OQ) exploring attitudes toward open-door and restraint-free policies in Psychiatry (OQ1: *Do you think in principle it would be possible to unlock the doors of acute psychiatric wards?* OQ2: *Do you think in principle it would be possible to give up on practices of seclusion and physical restraint in acute psychiatric wards?*), and the Ten Item Personality Inventory (TIPI) (30). All instruments were selected because of their simplicity and brevity, since a large number of items was supposed to increase respondent fatigue, measurement error, and misclassification. At the end of the booklet, a demographic form included the following items: age, gender, civil status, years of education, undergraduate program, academic year, and a question about any previous experience with psychiatric patients (i.e., stages in mental health services).

The AQ-9 (29) was developed after the AQ-27 (27, 31). The AQ-27 has been developed by Corrigan based on the Attribution Theory (32), and has been widely used in stigma research (33–37). It provides a clinical vignette describing an individual with schizophrenia (Harry) and asks the respondents to endorse their attitudes and beliefs toward Harry on a nine-point ordinal scale (9 = very much), with higher scores representing more stigmatizing attitudes. An Italian version of the AQ-27 has recently been validated (38). The AQ-9 was derived from the AQ-27 by extracting the nine items with the highest factor loadings, and it refers to the same domains as the AQ-27 (1 item = 1 domain): Pity (“I would feel pity for Harry”), Dangerousness (“How dangerous would you feel Harry is?”), Fear (“How scared

¹The higher education system in Italy adopts a 3+2 organization, where first level (Laurea Triennale) may correspond to a Bachelor Degree, while the two additional years (Laurea Magistrale) may be assimilated to a Master Degree.

TABLE 1 | Description of the sample, including demographic and academic features, personality traits, AQ-9 domains, and response to the Opinion Questions (OQ).

n = 1005	N/Mean	%/SD
Females	828	82.39
Age	20.51	2.50
Education (years)	14.72	1.42
Academic year		
1st year	421	41.89
2nd year	269	26.77
3rd year	315	31.34
Undergraduate programmes		
L1	297	29.55
L2	99	9.85
L3	325	32.34
L4	284	28.26
Previous experience in Psychiatry (n = 1003)		
No	767	76.47
Yes	236	23.53
I-TIPI		
Extraversion (n = 999)	3.95	1.48
Agreeableness (n = 1000)	5.17	1.08
Conscientiousness (n=995)	4.98	1.18
Emotional Stability (n = 996)	3.91	1.33
Openness to new experiences (n = 999)	4.84	1.15
AQ-9 domains		
Pity	5.85	1.87
Danger (n = 1003)	4.23	1.70
Fear (n = 999)	3.96	1.83
Blame (n = 997)	1.43	0.89
Segregation (n = 1003)	2.66	1.75
Anger (n = 1003)	1.41	0.93
Help (n = 996)	3.26	2.00
Avoidance (n = 995)	2.97	1.76
Coercion (n = 1004)	5.64	2.26
OQ1 (n = 987)		
Yes	884	89.56
No	103	10.44
OQ2 (n = 989)		
Yes	547	55.31
No	442	44.69

OQ1, Opinion Question 1: “Do you think in principle it would be possible to unlock the doors of acute psychiatric wards?”

OQ2, Opinion Question 2: “Do you think in principle it would be possible to drop practices of seclusion and/or physical restraint in acute psychiatric wards?”

of Harry would you feel?”), Blame (“I would think that it was Harry’s own fault that he is in the present condition”), Segregation (“I think it would be best for Harry’s community if he were put away in a psychiatric hospital”), Anger (“How angry would you feel at Harry?”), Help (“How likely is it that you would help Harry?”), Avoidance (“I would try to stay away from Harry”), and Coercion (“How much do you agree that Harry should be forced into treatment with his doctor even if he does not want to?”) (27, 31). No items are reverse scored,

but for the “Help” item responses range from “definitely would help” (score=1) to “definitely would not help” (score=9). In our sample the Cronbach’s alpha for the AQ-9 was 0.71.

Personality traits were evaluated using an Italian version (39) of the TIPI (30), a short instrument based on the Five-Factor Model (FFM) of personality (40), designed to assess the personality dimensions of Extraversion, Agreeableness, Conscientiousness, Emotional Stability and Openness to new experiences. The questionnaire consists of 10 items with a common stem “I see myself as” including two descriptors representing a pole of the Big-Five personality dimensions, for example: “I see myself as dependable, self-disciplined” (Item 3), “I see myself as open to new experience, complex” (Item 5). Each item is rated on a 7-point scale ranging from 1 (disagree strongly) to 7 (agree strongly). The score on each of the TIPI personality dimensions’ subscales is measured, and ranges from 2 to 14. Although somewhat inferior to the standard Big-Five instruments, the TIPI takes about only 1 min to complete, and its convergent and discriminant validity, test–retest reliability, and as well as patterns of external correlates has reached an adequate level (30).

Statistical and Machine Learning Analysis

STATISTICA 6.0 software package (Dell Software, Tulsa, OK, USA) was used for descriptive statistics and linear correlations. All tests were two-tailed and significance was set with an alpha value of 0.05. Our main outcome variables (AQ-9 items) were processed by a series of Student’s *t*-tests and one-way analysis of variance (ANOVAs) tests to detect possible differences across demographic and academic variables. Pearson product-moment correlation tests were also used to detect possible correlations with continuous variables, including TIPI personality dimensions. For the present study, only “moderate” to “strong” ($r > 0.40$) correlations were considered.

In recent years, machine learning approaches have gained interest in mental health as a method for building models to improve the diagnostic and therapeutic process (41, 42), to predict suicidality (43), as well as to analyse patterns of public stigma (44). Machine learning methods and, specifically, Gradient Boosting algorithms have been widely used in prediction models, to make decisions or to generate strategies (45–48), especially when there’s no theory-driven framework about the potential relationships among variables (49).

To detect the most critical predictors for our outcome variables, we applied a Gradient Boosting Regressor (GBR) algorithm to our sample. GBR is a supervised machine learning algorithm based on a decision tree model. Decision trees are statistical models that recursively partition the input space in order to find rules, which are predictive of the output. The learning procedure consecutively fits new models to provide a more accurate estimate of the response variable.

In our GBR models target variables were all AQ-9 items, while input variables were gender, academic year, undergraduate course and personality traits. Python 3.0 software package (Python Software Foundation, Wilmington, DE, USA) was used for machine learning.

RESULTS

A description of the sample is reported in **Table 1**. The majority of subjects was recruited among 1st year students. The L1 program included a higher proportion of males compared to the others (Chi-sq = 16.11, d.f. = 3, $p = 0.001$), while no significant difference was found in the male/female ratio across academic years. More than three in four had never had any experience with psychiatric patients, and gender or choice of undergraduate program had no effect on this ratio. Conversely, almost one in three students attending the 3rd year had already had at least one experience in Psychiatry (1st year = 21.72% vs. 2nd year = 18.22% vs 3rd year = 30.48%; Chi-sq = 13.43, d.f. = 2, $p = 0.001$). Female students were younger (20.43 ± 2.45 vs. 20.88 ± 2.69 ; $t = -2.19$, d.f. = 1003, $p = 0.029$) and reported higher scores on the personality traits of Agreeableness (5.23 ± 1.09 vs. 4.93 ± 1.00 , $t = 3.30$, d.f. = 998, $p = 0.001$) and Conscientiousness (5.04 ± 1.18 vs. 4.71 ± 1.14 , $t = 3.42$, d.f. = 993, $p = 0.001$), while male students reported higher scores on Emotional Stability (4.31 ± 1.41 vs. 3.82 ± 1.30 , $t = -4.48$, d.f. = 994, $p < 0.001$).

Regarding opinion questions (**Table 1**), the majority of survey respondents (89.56%) declared to be in favor of unlocking the doors of acute psychiatric wards (OQ1). A higher proportion of favorable subjects was found among students attending the 1st year (1st year = 93.46% vs. 2nd year = 90.19% vs. 3rd year = 83.82%, Chi-sq = 17.74, d.f. = 2, $p < 0.001$) and the L1 class (L1 = 94.16% vs. L2 = 88.89% vs. L3 = 85.27% vs. L4 = 89.93%, Chi-sq = 12.96, d.f. = 3, $p = 0.005$). Conversely, opinions about the practice of restraint (OQ2) were not affected by academic year or undergraduate program. A history of previous direct experience with psychiatric patients resulted in no significant effect on answers to either OQ1 or OQ2.

As regards personality traits, a small significant difference was found across years in terms of Openness, with the highest levels in the 1st year (1st year = 4.96 ± 1.18 vs. 2nd year = 4.80 ± 1.08 vs 3rd year = 4.72 ± 1.14 ; $F = 4.21$, d.f. = 2,996, $p = 0.015$). Some differences across undergraduate programmes were also found in terms of Openness (L1 = 4.97 ± 1.13 vs. L2 = 4.61 ± 1.05 vs. L3 = 4.77 ± 1.18 vs. L4 = 4.86 ± 1.14 ; $F = 3.01$, d.f. = 3,995, $p = 0.029$) and Agreeableness (L1 = 5.14 ± 1.09 vs. L2 = 5.20 ± 1.17 vs. L3 = 5.05 ± 1.05 vs. L4 = 5.34 ± 1.06 ; $F = 3.79$, d.f. = 3,996, $p = 0.010$), while a history of previous experiences in Psychiatry was associated to higher levels of Extraversion (4.17 ± 1.42 vs. 3.88 ± 1.49 , $t = 2.63$, d.f. = 995, $p = 0.009$). Higher scores on Openness were found in those who declared to be in favor of open-doors (4.87 ± 1.12 vs. 4.57 ± 1.33 , $t = 2.51$, d.f. = 979, $p = 0.012$) and no-restraint policies (4.93 ± 1.10 vs. 4.74 ± 1.18 , $t = 2.62$, d.f. = 981, $p = 0.009$), the latest also reporting higher scores on Conscientiousness (5.14 ± 1.14 vs. 4.86 ± 1.19 , $t = -3.72$, d.f. = 978, $p < 0.001$).

Exploring the effect of demographic and academic variables on AQ-9 domains (**Table 2**), we found that male students scored significantly higher on Pity, Blame, Help and Avoidance, while no relevant effect was found for age or duration of education. Students attending the L1 program showed higher scores on Pity and lower scores on Danger, while the L2 program was associated

to higher Coercion scores. Those who answered positively to the OQ1 resulted to be higher in Coercion, while those who declared to be in favor of no-restraint policies (OQ2) were lower in all stigmatizing attitudes except Pity and Anger. Finally, a previous experience with psychiatric patients was associated to lower scores on Danger, Fear, Segregation, Help, and Avoidance.

As regards bivariate correlations (**Table 3**), perceived dangerousness (Danger) showed a significant positive correlation with negative emotions (Fear) and negative behavioral responses (Segregation, Avoidance and Coercion). Fear was also positively correlated with Segregation and Avoidance, while avoidant attitudes increased together with Segregation and Help. Although some significant correlations were found between some personality traits and the AQ-9 domains, they were in the range of “very weak” (<0.19) linear relationships.

Hence, we introduced GBR as a complementary approach to explore the latent relationship among all the aforementioned variables. Given the fact that OQ items were well-explained by their association with AQ-9 dimensions, they were not included in our models.

By leveraging the Machine Learning technique, Blame and Anger resulted to be the most predictable targets, their accuracy being 65.6 and 70.9%, respectively. According to our models, Agreeableness and Extraversion emerged as the most relevant predictors for Blame (**Figure 1**), while Emotional Stability and Openness to new experiences emerged as the most effective contributors to Anger (**Figure 2**).

DISCUSSION

This study explores the role of some demographic, academic and personality features on the development of stigmatizing attitudes in a large sample of undergraduate Psychology students. Machine learning was adopted as a complementary tool to explore any association among variables that could not be detected by traditional statistical methods.

First glance, our findings seem to support the view of a “gender effect” on stigma (50–52), since male students reported significantly higher scores on several AQ-9 items (Pity, Blame, Help and Avoidance) when compared to their female peers. No association could be gathered for the other demographic variables (age, level of education and civil status), probably because of the homogeneity of the sample.

However, attitudes toward people with mental illness may vary to a small extent only depending on socio-demographic characteristics, and findings about a specific “gender effect” have shown to be quite inconsistent (53). Thus, a higher level of negative attitudes in male students may also depend on other factors, such as a different conceptualization of mental illness. Indeed, women are more likely to endorse psychosocial conceptualizations instead of biological explanations of mental illness (54), and when compared to other causal explanations, a biological understanding of mental health problems has been repeatedly associated to more negative attitudes toward patients (26, 55–58).

TABLE 2 | Effect of gender and academic variables on AQ-9 domains.

	Pity	Danger	Fear	Blame	Segregation	Anger	Help	Avoidance	Coercion
GENDER									
Females	5.76 (1.89)	4.23 (1.69)	4.01 (1.84)	1.40 (0.86)	2.68 (1.79)	1.40 (0.92)	3.17 (2.00)	2.91 (1.73)	5.69 (2.26)
Males	6.28 (1.71)	4.24 (1.72)	3.74 (1.75)	1.60 (1.01)	2.58 (1.54)	1.46 (0.97)	3.70 (1.93)	3.25 (1.85)	5.40 (2.26)
<i>t</i> (<i>p</i>)	−3.41 (0.001)	−0.05 (n.s.)	1.74 (n.s.)	−2.7 (0.007)	0.71 (n.s.)	−0.86 (n.s.)	−3.21 (0.001)	−2.34 (0.019)	1.53 (n.s.)
ACADEMIC YEAR									
1st year	5.75 (1.90)	4.15 (1.73)	3.85 (1.88)	1.46 (0.95)	2.70 (1.77)	1.37 (0.98)	3.31 (2.01)	3.03 (1.83)	5.55 (2.34)
2nd year	6.10 (1.75)	4.38 (1.71)	4.14 (1.78)	1.52 (0.83)	2.74 (1.80)	1.46 (0.94)	3.29 (1.98)	2.96 (1.71)	5.89 (2.15)
3rd year	5.76 (1.91)	4.21 (1.63)	3.95 (1.79)	1.42 (0.86)	2.55 (1.69)	1.41 (0.85)	3.16 (2.00)	2.89 (1.71)	5.53 (2.22)
<i>F</i> (<i>p</i>)	3.41 (0.033)	1.47 (n.s.)	2.09 (n.s.)	0.21 (n.s.)	1.00 (n.s.)	0.71 (n.s.)	0.53 (n.s.)	0.57 (n.s.)	2.35 (n.s.)
UNDERGRADUATE PROGRAMMES									
L1	6.06 (1.80)	4.00 (1.55)	3.89 (1.83)	1.45 (0.86)	2.49 (1.59)	1.33 (0.80)	3.30 (2.02)	2.98 (1.82)	5.73 (2.18)
L2	5.54 (1.82)	4.18 (1.53)	3.91 (1.71)	1.39 (0.91)	2.69 (1.73)	1.34 (0.67)	3.02 (1.87)	2.68 (1.52)	6.12 (2.05)
L3	5.69 (1.90)	4.36 (1.83)	4.05 (1.90)	1.48 (0.93)	2.81 (1.86)	1.48 (1.05)	3.33 (2.02)	3.07 (1.77)	5.42 (2.43)
L4	5.90 (1.90)	4.35 (1.72)	3.95 (1.80)	1.38 (0.89)	2.66 (1.78)	1.43 (0.98)	3.22 (1.99)	2.94 (1.75)	5.62 (2.19)
<i>F</i> (<i>p</i>)	3.41 (0.017)	2.98 (0.031)	0.41 (n.s.)	0.75 (n.s.)	1.75 (n.s.)	1.64 (n.s.)	0.69 (n.s.)	1.28 (n.s.)	2.65 (0.048)
PREVIOUS EXPERIENCE									
Yes	5.75 (1.93)	3.99 (1.74)	3.56 (1.78)	1.44 (0.93)	2.37 (1.70)	1.39 (1.02)	2.97 (1.91)	2.54 (1.50)	5.42 (2.24)
No	5.88 (1.85)	4.31 (1.68)	4.09 (1.83)	1.43 (0.88)	2.75 (1.76)	1.41 (0.90)	3.35 (2.02)	3.10 (1.81)	5.71 (2.26)
<i>t</i> (<i>p</i>)	−0.91 (n.s.)	−2.57 (0.010)	−3.83 (<0.001)	0.1 (n.s.)	−2.93 (0.003)	−0.34 (n.s.)	−2.58 (0.010)	−4.29 (<0.001)	−1.72 (n.s.)
OQ1									
Yes	5.84 (1.87)	4.22 (1.70)	3.96 (1.82)	1.42 (0.88)	2.67 (1.73)	1.39 (0.91)	3.26 (2.01)	2.93 (1.73)	5.71 (2.22)
No	5.78 (1.91)	4.34 (1.66)	3.86 (1.94)	1.52 (0.97)	2.64 (1.92)	1.46 (1.01)	3.33 (2.01)	3.24 (1.94)	5.14 (2.41)
<i>t</i> (<i>p</i>)	0.34 (n.s.)	−0.68 (n.s.)	0.49 (n.s.)	−1.11 (n.s.)	0.14 (n.s.)	−0.66 (n.s.)	−0.33 (n.s.)	−1.68 (n.s.)	2.43 (0.015)
OQ2									
Yes	5.78 (1.88)	4.06 (1.70)	3.78 (1.81)	1.38 (0.81)	2.40 (1.67)	1.39 (0.98)	3.08 (1.96)	2.76 (1.63)	5.40 (2.27)
No	5.95 (1.86)	4.40 (1.66)	4.19 (1.81)	1.50 (1.00)	2.99 (1.80)	1.43 (0.86)	3.45 (2.02)	3.18 (1.85)	5.95 (2.20)
<i>t</i> (<i>p</i>)	−1.49 (n.s.)	−3.48 (0.001)	−3.54 (<0.001)	−2.18 (0.030)	−5.31 (<0.001)	−0.68 (n.s.)	−2.85 (0.005)	−3.80 (<0.001)	−3.85 (<0.001)

Statistics for each AQ-9 item are reported under means and SDs (in brackets).

Significant *p*-values are reported in bold.

In our sample, a higher proportion of males was found in the L1 program, which is supposed to provide a cognitive and neurobiological approach to mental health problems, but the same class also included a higher proportion of subjects who declared to be in favor of open-door policies in Psychiatry (OQ1). Further, L1 students reported less perceived dangerousness (Danger), and more piteous attitude (Pity) than their peers, while those who enrolled in the L2 program scored higher in Coercion. Thus, these findings seem to suggest that biogenetic causal models of mental illness, when compared to other models (i.e., developmental and educational), may not only be associated to more negative attitudes in general, but they may as well reduce notions of self-responsibility and subsequently evoke less negative responses such as pity and help (59). Nevertheless, since no specific instrument was adopted to assess opinions about mental illness, we can only make a tentative but challenging hypothesis about a possible association among gender, choice of academic profile and attitudes toward people with mental illness.

Some personality traits, such as Openness and Agreeableness, resulted to play a major role on stigmatizing attitudes. Indeed,

although bivariate correlations were in the range of very weak associations, according to our machine learning algorithms, Agreeableness and Extraversion were predictive of blaming attitudes (Blame), while Emotional Stability and Openness to new experiences emerged as the most effective contributors to Anger (the direction of effect deriving from GBR algorithms could not be determined, but may be partly inferred from significant bivariate correlations). Further, higher scores on Openness were found in those who declared to be in favor of open-doors and no-restraint policies in Psychiatry.

To our knowledge there are very few studies addressing the relationship between personality and mental health related stigma. A recent work by our group (28) on a sample of mental health professionals evidenced a negative correlation between Openness and avoidant attitudes toward patients. A previous study by Brown et al. (60) on a sample of college students, found that Openness predicted a decreased perception of dangerousness and less social distancing, while lower scores on Agreeableness predicted a negative emotionality toward subjects suffering from mental illness. Interestingly, Openness and Agreeableness were also found to be positively associated to empathy toward patients in a sample of medical students (61).

TABLE 3 | Bivariate correlations expressed by *r* and *p* values (in brackets) among AQ-9 items and personality traits.

<i>n</i> = 940 case-wise deletion of missing data	Pity	Danger	Fear	Blame	Segregation	Anger	Help	Avoidance	Coercion	Extraversion	Agreeable- ness	Conscientious- ness	Emotional Stability	Openness
Pity	1.00 (<i>p</i> = —)													
Danger	0.26 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)												
Fear	0.21 (<i>p</i> < 0.001)	0.63 (<i>p</i> = 0.00)	1.00 (<i>p</i> = —)											
Blame	0.01 (<i>p</i> = n.s.)	0.13 (<i>p</i> < 0.001)	0.11 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)										
Segregation	0.08 (<i>p</i> = 0.01)	0.37 (<i>p</i> = 0.00)	0.38 (<i>p</i> = 0.00)	0.24 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)									
Anger	0.07 (<i>p</i> = 0.02)	0.20 (<i>p</i> < 0.001)	0.20 (<i>p</i> < 0.001)	0.25 (<i>p</i> < 0.001)	0.27 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)								
Help	0.03 (<i>p</i> = 0.33)	0.15 (<i>p</i> < 0.001)	0.23 (<i>p</i> < 0.001)	0.12 (<i>p</i> < 0.001)	0.18 (<i>p</i> < 0.001)	0.08 (<i>p</i> = 0.01)	1.00 (<i>p</i> = —)							
Avoidance	0.11 (<i>p</i> = 0.001)	0.41 (<i>p</i> = 0.00)	0.48 (<i>p</i> = 0.00)	0.21 (<i>p</i> < 0.001)	0.31 (<i>p</i> = 0.00)	0.28 (<i>p</i> < 0.001)	0.44 (<i>p</i> = 0.00)	1.00 (<i>p</i> = —)						
Coercion	0.11 (<i>p</i> = 0.001)	0.30 (<i>p</i> = 0.00)	0.28 (<i>p</i> < 0.001)	0.01 (<i>p</i> = n.s.)	0.22 (<i>p</i> < 0.001)	0.10 (<i>p</i> = 0.002)	0.13 (<i>p</i> < 0.001)	0.21 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)					
Extraversion	0.02 (<i>p</i> = n.s.)	0.03 (<i>p</i> = n.s.)	0.00 (<i>p</i> = n.s.)	0.06 (<i>p</i> = n.s.)	0.03 (<i>p</i> = n.s.)	0.03 (<i>p</i> = n.s.)	0.00 (<i>p</i> = n.s.)	−0.06 (<i>p</i> = n.s.)	0.09 (<i>p</i> = 0.004)	1.00 (<i>p</i> = —)				
Agreeableness	0.07 (<i>p</i> = 0.039)	0.03 (<i>p</i> = n.s.)	0.04 (<i>p</i> = n.s.)	0.00 (<i>p</i> = n.s.)	−0.03 (<i>p</i> = n.s.)	−0.06 (<i>p</i> = 0.049)	−0.01 (<i>p</i> = n.s.)	−0.07 (<i>p</i> = 0.046)	0.09 (<i>p</i> = 0.007)	−0.09 (<i>p</i> = 0.004)	1.00 (<i>p</i> = —)			
Conscientiousness	−0.04 (<i>p</i> = n.s.)	0.03 (<i>p</i> = n.s.)	0.06 (<i>p</i> = n.s.)	−0.02 (<i>p</i> = n.s.)	0.05 (<i>p</i> = n.s.)	−0.08 (<i>p</i> = 0.016)	−0.03 (<i>p</i> = n.s.)	−0.06 (<i>p</i> = n.s.)	0.14 (<i>p</i> < 0.001)	−0.11 (<i>p</i> = 0.001)	0.18 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)		
Emotional Stability	−0.06 (<i>p</i> = n.s.)	−0.01 (<i>p</i> = n.s.)	−0.04 (<i>p</i> = n.s.)	0.03 (<i>p</i> = n.s.)	0.05 (<i>p</i> = n.s.)	−0.04 (<i>p</i> = n.s.)	0.08 (<i>p</i> = 0.016)	−0.01 (<i>p</i> = n.s.)	−0.04 (<i>p</i> = n.s.)	0.03 (<i>p</i> = n.s.)	0.17 (<i>p</i> < 0.001)	0.15 (<i>p</i> < 0.001)	1.00 (<i>p</i> = —)	
Openness	−0.01 (<i>p</i> = n.s.)	−0.10 (<i>p</i> = 0.002)	−0.16 (<i>p</i> < 0.001)	−0.01 (<i>p</i> = n.s.)	−0.16 (<i>p</i> < 0.001)	−0.06 (<i>p</i> = 0.048)	−0.15 (<i>p</i> < 0.001)	−0.19 (<i>p</i> < 0.001)	−0.09 (<i>p</i> = 0.009)	0.26 (<i>p</i> < 0.001)	0.12 (<i>p</i> < 0.001)	−0.10 (<i>p</i> = 0.003)	0.03 (<i>p</i> = n.s.)	1.00 (<i>p</i> = —)

Significant moderate-to-high correlations are evidenced in bold.

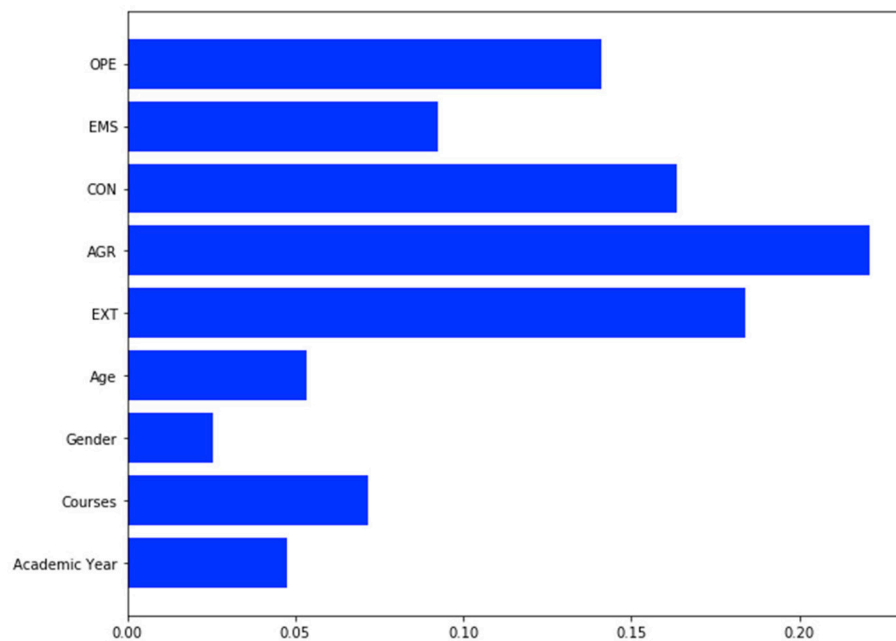


FIGURE 1 | GBR prediction model for Blame item. OPE, Openness; EMS, Emotional Stability; CON, Conscientiousness; AGR, Agreeableness; EXT, Extraversion. Accuracy for Blame is 0.656.

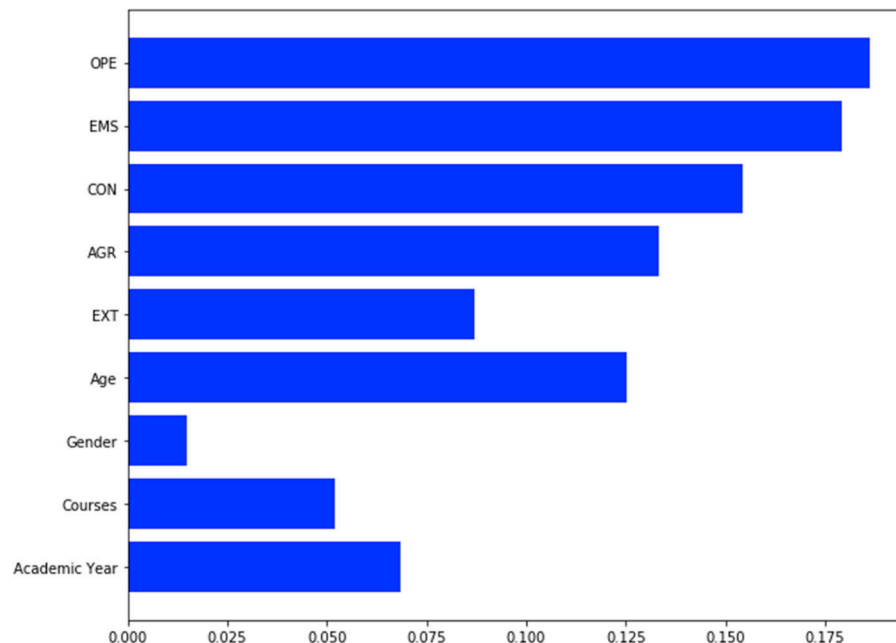


FIGURE 2 | GBR prediction model for Anger item. OPE, Openness; EMS, Emotional Stability; CON, Conscientiousness; AGR, Agreeableness; EXT, Extraversion. Accuracy for Anger is 0.709.

Finally, a previous experience with psychiatric patients (i.e., a training experience in a psychiatric unit) was associated to lower scores on Danger, Fear, Segregation, Help and Avoidance. Fear, perceived dangerousness and desire for social distance are

supposed to decrease as familiarity with psychiatric patients increases (62). A recent review by Yamaguchi et al. (63) has evidenced that the most effective interventions to reduce mental health related stigma in university and college students were

those implying any kind of contact. A contact element, even of indirect nature (i.e., video- or audio-taped testimonies), may be the most relevant factor in tackling the stigma attached to mental illness (64–66).

The main limitation of our study is represented by its cross-sectional design. The generalizability of results cannot be assumed due to the limited representativeness of the sample, which prevalently comprised young females with a high level of education. Another limitation is the lack of information about those subjects who did not take part in the study, since students who did not choose to participate might have vastly different opinions on stigma. However, the sample's homogenous nature might have been important for our results on the role of personality, because FFM traits are supposed to be characterized by unique changes during the emerging adulthood phase (67, 68). Additionally, our findings are based on self-reported attitudes, which inherently have risk of response bias, including social desirability. Familiarity with mental health problems was only explored through the indirect index of training experiences with psychiatric patients, while personal experience with mental illness (i.e., a family member) was not considered. Finally, unlike the traditional statistical approach, the relationship between predictors and variables in machine learning models are rather vague, and the interpretation and explanation of results generated by such processes may be challenging. However, as claimed Woo et al. (69), the use of innovative technique starts with testing and exploration.

Notwithstanding these limitations, this study provides evidence that: (a) male Psychology students may report greater

negative attitudes toward patients than their female peers; (b) any direct experience with psychiatric patients may have a significant effect in lessening stigmatizing attitudes; (c) some personality traits, such as Agreeableness and Openness to new experiences may have a relevant role in the development of some components of mental health stigma.

These results seem to confirm that a training experience including a direct personal experience with psychiatric patients may exert a substantial influence on shaping less negative attitudes toward mental illnesses and Psychiatry. Our findings seem also to suggest that the personality of students should be taken into account in developing anti-stigma programs in undergraduate education. Further research, with increased generalizability of samples and more valid measures should be undertaken to disentangle the complex relationship among demographic features, academic variables, personality traits and attitudes toward people suffering from mental illness.

AUTHOR CONTRIBUTIONS

All the authors actively contributed to the production of the research paper. LZ, SS, and MS developed the research project. JQ, YS, and GB contributed to statistical analyses. All authors participated in writing the paper.

ACKNOWLEDGMENTS

The authors would like to thank Miss Anna Francesca Riggi for data collection.

REFERENCES

- Goffman E. *Stigma: Notes on the Management of Spoiled Identity*. Englewood Cliffs, NJ: Prentice-Hall (1963).
- Jones E, Farina A, Hastorf A, Markus H, Miller DT, Scott R. *Social Stigma: The Psychology of Marked Relationships*. New York, NY: Freeman (1984).
- Link B, Phelan J. Conceptualizing stigma. *Annu Rev Sociol.* (2001) 27:363–85. doi: 10.1146/annurev.soc.27.1.363
- Corrigan P. *On the Stigma of Mental Illness*. Washington DC: American Psychological Association (2005).
- Corrigan P. How stigma interferes with mental health care. *Am Psychol.* (2004) 59:614–25. doi: 10.1037/0003-066X.59.7.614
- Rusch N, Angermeyer MC, Corrigan PW. Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *Eur Psychiatry* (2005) 20:529–39. doi: 10.1016/j.eurpsy.2005.04.004
- Thornicroft G. *Shunned: Discrimination against People with Mental Illness*. Oxford, UK: Oxford University Press (2006).
- Kessler RC, Mickelson KD, Williams DR. The prevalence, distribution, and mental health correlates of perceived discrimination in the United States. *J Health Soc Behav.* (1999) 40:208–30. doi: 10.2307/2676349
- Regier DA, Farmer ME, Rae DS, Myers JK, Kramer M, Robins LN, et al. One-month prevalence of mental disorders in the United States and sociodemographic characteristics: the Epidemiologic Catchment Area Study. *Acta Psychiatr Scand.* (1993) 88:35–47. doi: 10.1111/j.1600-0447.1993.tb03411.x
- Thornicroft G. Stigma and discrimination limit access to mental health care. *Epidemiol Psychiatr Soc.* (2008) 17:14–9. doi: 10.1017/S1121189X0002621
- Gabbidon J, Farrelly S, Hatch SL, Henderson C, Williams P, Bhugra D, et al. Discrimination attributed to mental illness or race-ethnicity by users of community psychiatric services. *Psychiatr Serv.* (2014) 65:1360–6. doi: 10.1176/appi.ps.201300302
- Lauber C, Anthony M, Ajdacic-Gross V, Rossler W. What about psychiatrists' attitude to mentally ill people? *Eur Psychiatry* (2004) 19:423–7. doi: 10.1016/j.eurpsy.2004.06.019
- Ono Y, Satsumi Y, Kim Y, Iwade T, Moriyama K, Nakane Y, et al. Schizophrenia: is it time to replace the term? *Psychiatry Clin Neurosci.* (1999) 53:335–41. doi: 10.1046/j.1440-1819.1999.00555.x
- Thornicroft C, Wyllie A, Thornicroft G, Mehta N. Impact of the "Like Minds, Like Mine" anti-stigma and discrimination campaign in New Zealand on anticipated and experienced discrimination. *Aust N Z J Psychiatry* (2014) 48:360–70. doi: 10.1177/0004867413512687
- Ucok A, Polat A, Sartorius N, Erkoc S, Atakli C. Attitudes of psychiatrists toward patients with schizophrenia. *Psychiatry Clin Neurosci.* (2004) 58:89–91. doi: 10.1111/j.1440-1819.2004.01198.x
- Garman AN, Corrigan PW, Morris S. Staff burnout and patient satisfaction: evidence of relationships at the care unit level. *J Occup Health Psychol.* (2002) 7:235–41. doi: 10.1037/1076-8998.7.3.235
- Gowdy EL, Carlson LS, Rapp CA. Practices differentiating high-performing from low-performing supported employment programs. *Psychiatr Rehabil J.* (2003) 26:232–9. doi: 10.2975/26.2003.232.239
- Gudeman J. Closing doors on acute psychiatric units: time to change? *Psychiatr Serv.* (2005) 56:1047. doi: 10.1176/appi.ps.56.9.1047
- Volpe U, Fiorillo A, Luciano M, Del Vecchio V, Palumbo C, Calo S, et al. Pathways to mental health care in Italy: results from a multicenter study. *Int J Soc Psychiatry* (2014) 60:508–13. doi: 10.1177/0020764013501648
- Jorm AF, Korten AE, Jacomb PA, Christensen H, Henderson S. Attitudes towards people with a mental disorder: a survey of the Australian public and health professionals. *Aust N Z J Psychiatry* (1999) 33:77–83. doi: 10.1046/j.1440-1614.1999.00513.x

21. Nordt C, Rossler W, Lauber C. Attitudes of mental health professionals toward people with schizophrenia and major depression. *Schizophr Bull.* (2006) 32:709–14. doi: 10.1093/schbul/sbj065
22. Del Olmo-Romero F, Gonzalez-Blanco M, Sarro S, Gracio J, Martin-Carrasco M, Martinez-Cabezon AC, et al. Mental health professionals' attitudes towards mental illness: professional and cultural factors in the INTER NOS study. *Eur Arch Psychiatry Clin Neurosci.* (2018). doi: 10.1007/s00406-018-0867-5. [Epub ahead of print].
23. Korszun A, Dinos S, Ahmed K, Bhui K. Medical student attitudes about mental illness: does medical-school education reduce stigma? *Acad Psychiatry* (2012) 36:197–204. doi: 10.1176/appi.ap.10110159
24. Gray AJ. Stigma in psychiatry. *J R Soc Med.* (2002) 95:72–6. doi: 10.1177/014107680209500205
25. Mukherjee R, Fialho A, Wijetunge A, Checinski K, Surgenor T. The stigmatisation of psychiatric illness: the attitudes of medical students and doctors in a London teaching hospital. *Psychiatr Bull.* (2002) 26:178–81. doi: 10.1192/pb.26.5.178
26. Read J, Harré N. (2001). The role of biological and genetic causal beliefs in the stigmatisation of “mental patients.” *J Ment Health* 10:223–5. doi: 10.1080/09638230123129
27. Corrigan P, Markowitz FE, Watson A, Rowan D, Kubiak MA. An attribution model of public discrimination towards persons with mental illness. *J Health Soc Behav.* (2003) 44:162–79. doi: 10.2307/1519806
28. Zaninotto L, Rossi G, Danieli A, Frasson A, Meneghetti L, Zordan M, et al. Exploring the relationships among personality traits, burnout dimensions and stigma in a sample of mental health professionals. *Psychiatry Res.* (2018) 264:327–33. doi: 10.1016/j.psychres.2018.03.076
29. Corrigan PW, Powell KJ, Michaels PJ. Brief battery for measurement of stigmatizing versus affirming attitudes about mental illness. *Psychiatry Res.* (2014) 215:466–70. doi: 10.1016/j.psychres.2013.12.006
30. Gosling SD, Rentfrow PJ, Swann WB Jr. A very brief measure of the Big-Five personality domains. *J Res Pers.* (2003) 37:504–28. doi: 10.1016/S0092-6566(03)00046-1
31. Corrigan PW, Rowan D, Green A, Lundin R, River P, Uphoff-Wasowski K, et al. Challenging two mental illness stigmas: personal responsibility and dangerousness. *Schizophr Bull.* (2002) 28:293–309. doi: 10.1093/oxfordjournals.schbul.a006939
32. Weiner B. *Judgements of Responsibility: A Foundation for a Theory of Social Conduct.* New York, NY: Guilford Press (1995).
33. Brown SA. Implementing a brief hallucination simulation as a mental illness stigma reduction strategy. *Community Ment Health J.* (2010) 46:500–4. doi: 10.1007/s10597-009-9229-0
34. Halter MJ. The stigma of seeking care and depression. *Arch Psychiatr Nurs.* (2004) 18:178–84. doi: 10.1016/j.apnu.2004.07.005
35. Hudes S. *Multiple Factors That Affect Stigma Toward People with Schizophrenia: Previous Knowledge, Level of Familiarity, and New Information.* Dissertation, ProQuest, Ann Arbor, MI (2007).
36. Kanter JW, Rusch LC, Brondino MJ. Depression self-stigma: a new measure and preliminary findings. *J Nerv Ment Dis.* (2008) 196:663–70. doi: 10.1097/NMD.0b013e318183f8af
37. Law GU, Rostill-Brookes H, Goodman D. Public stigma in health and non-healthcare students: attributions, emotions and willingness to help with adolescent self-harm. *Int J Nurs Stud.* (2009) 46:107–18. doi: 10.1016/j.ijnurstu.2008.08.014
38. Pingani L, Forghieri M, Ferrari S, Ben-Zeev D, Artoni P, Mazzi F, et al. Stigma and discrimination toward mental illness: translation and validation of the Italian version of the Attribution Questionnaire-27 (AQ-27-I). *Soc Psychiatry Psychiatr Epidemiol.* (2012) 47:993–9. doi: 10.1007/s00127-011-0407-3
39. Chiorri C, Bracco F, Piccinno T, Modafferi C, Battini V. Psychometric properties of a revised version of the ten item personality inventory. *Eur J Psychol Assess.* (2015) 31:109–19. doi: 10.1027/1015-5759/a000215
40. Costa PT, McCrae RR. *Revised NEO Personality Inventory and NEO Five Factor Inventory Professional Manual.* Odessa, FL: Psychological Assessment Resources (1992).
41. Iwabuchi SJ, Liddle PE, Palaniyappan L. Clinical utility of machine-learning approaches in schizophrenia: improving diagnostic confidence for translational neuroimaging. *Front Psychiatry* (2013) 4:95. doi: 10.3389/fpsy.2013.00095
42. Salvador R, Radua J, Canales-Rodriguez EJ, Solanes A, Sarro S, Goikolea JM, et al. Evaluation of machine learning algorithms and structural features for optimal MRI-based diagnostic prediction in psychosis. *PLoS ONE* (2017) 12:e0175683. doi: 10.1371/journal.pone.0175683
43. Walsh C, Ribeiro J, Franklin J. Predicting risk of suicide attempts over time through machine learning. *Clin Psychol Sci.* (2017) 5:457–69. doi: 10.1177/2167702617691560
44. Tokmic F, Hadzikadic M, Cook JR, Tcheremissine OV. Development of a behavioral health stigma measure and application of machine learning for classification. *Innov Clin Neurosci.* (2018) 15:34–42.
45. Ayaru L, Ypsilantis PP, Nanapragasam A, Choi RC, Thillanathan A, Min-Ho L, et al. Prediction of Outcome in Acute Lower Gastrointestinal Bleeding Using Gradient Boosting. *PLoS ONE* (2015) 10:e0132485. doi: 10.1371/journal.pone.0132485
46. Chen HY, Yu SL, Chen CH, Chang GC, Chen CY, Yuan A, et al. A five-gene signature and clinical outcome in non-small-cell lung cancer. *N Engl J Med.* (2007) 356:11–20. doi: 10.1056/NEJMoa060096
47. Dodd S, Berk M, Kellin K, Zhang Q, Eriksson E, Deberdt W, et al. Application of the Gradient Boosted method in randomised clinical trials: participant variables that contribute to depression treatment efficacy of duloxetine, SSRIs or placebo. *J Affect Disord.* (2014) 168:284–93. doi: 10.1016/j.jad.2014.05.014
48. Gurm HS, Kooiman J, LaLonde T, Grines C, Share D, Seth M. A random forest based risk model for reliable and accurate prediction of receipt of transfusion in patients undergoing percutaneous coronary intervention. *PLoS ONE* (2014) 9:e96385. doi: 10.1371/journal.pone.0096385
49. Natekin A, Knoll A. Gradient boosting machines, a tutorial. *Front Neurobot.* (2013) 7:21. doi: 10.3389/fnbot.2013.00021
50. Farina A. Are women nicer people than men? sex and the stigma of mental disorders. *Clin Psychol Rev.* (1981) 1:223–43. doi: 10.1016/0272-7358(81)90005-2
51. Mackay N, Barrowclough C. Accident and emergency staff's perceptions of deliberate self-harm: attributions, emotions and willingness to help. *Br J Clin Psychol.* (2005) 44:255–67. doi: 10.1348/014466505X29620
52. Wang J, Fick G, Adair C, Lai D. Gender specific correlates of stigma toward depression in a Canadian general population sample. *J Affect Disord.* (2007) 103:91–7. doi: 10.1016/j.jad.2007.01.010
53. Angermeyer MC, Dietrich S. Public beliefs about and attitudes towards people with mental illness: a review of population studies. *Acta Psychiatr Scand.* (2006) 113:163–79. doi: 10.1111/j.1600-0447.2005.00699.x
54. Holzinger A, Floris F, Schomerus G, Carta MG, Angermeyer MC. Gender differences in public beliefs and attitudes about mental disorder in western countries: a systematic review of population studies. *Epidemiol Psychiatr Sci.* (2012) 21:73–85. doi: 10.1017/S2045796011000552
55. Angermeyer MC, Holzinger A, Carta MG, Schomerus G. Biogenetic explanations and public acceptance of mental illness: systematic review of population studies. *Br J Psychiatry* (2011) 199:367–72. doi: 10.1192/bjp.bp.110.085563
56. Magliano L, Read J, Rinaldi A, Costanzo R, De Leo R, Schioppa G, et al. The influence of causal explanations and diagnostic labeling on psychology students' beliefs about treatments, prognosis, dangerousness and unpredictability in Schizophrenia. *Community Ment Health J.* (2016) 52:361–9. doi: 10.1007/s10597-015-9901-5
57. Pescosolido BA, Martin JK, Long JS, Medina TR, Phelan JC, Link BG. A disease like any other? A decade of change in public reactions to schizophrenia, depression, and alcohol dependence. *Am J Psychiatry* (2010) 167:1321–30. doi: 10.1176/appi.ajp.2010.09121743
58. Speerforck S, Schomerus G, Pruess S, Angermeyer MC. Different biogenetic causal explanations and attitudes towards persons with major depression, schizophrenia and alcohol dependence: is the concept of a chemical imbalance beneficial? *J Affect Disord.* (2014) 168:224–8. doi: 10.1016/j.jad.2014.06.013
59. Corrigan PW. Mental health stigma as social attribution: implications for research methods and attitude change. *Clin Psychol Sci Pract.* (2000) 7:48–67. doi: 10.1093/clipsy.7.1.48
60. Brown SA. The contribution of previous contact and personality traits to severe mental illness stigma. *Am J Psychiatr Rehab.* (2012) 274–89. doi: 10.1080/15487768.2012.703553

61. Magalhaes E, Costa P, Costa MJ. Empathy of medical students and personality: evidence from the five-factor model. *Med Teach.* (2012) 34:807–12. doi: 10.3109/0142159X.2012.702248
62. Angermeyer MC, Matschinger H, Corrigan PW. Familiarity with mental illness and social distance from people with schizophrenia and major depression: testing a model using data from a representative population survey. *Schizophr Res.* (2004) 69:175–82. doi: 10.1016/S0920-9964(03)00186-5
63. Yamaguchi S, Wu SI, Biswas M, Yate M, Aoki Y, Barley EA, et al. Effects of short-term interventions to reduce mental health-related stigma in university or college students: a systematic review. *J Nerv Ment Dis.* (2013) 201:490–503. doi: 10.1097/NMD.0b013e31829480df
64. Galletly C, Burton C. Improving medical student attitudes towards people with schizophrenia. *Aust N Z J Psychiatry* (2011) 45:473–6. doi: 10.3109/00048674.2011.541419
65. Stubbs A. Reducing mental illness stigma in health care students and professionals: a review of the literature. *Australas Psychiatry* (2014) 22:579–84. doi: 10.1177/1039856214556324
66. Thornicroft G, Mehta N, Clement S, Evans-Lacko S, Doherty M, Rose D, et al. Evidence for effective interventions to reduce mental-health-related stigma and discrimination. *Lancet* (2016) 387:1123–32. doi: 10.1016/S0140-6736(15)00298-6
67. Lucas RE, Donnellan MB. Personality development across the life span: longitudinal analyses with a national sample from Germany. *J Pers Soc Psychol.* (2011) 101:847–61. doi: 10.1037/a0024298
68. McCrae RR, Costa PT. Jr, Terracciano A, Parker WD, Mills CJ, et al. Personality trait development from age 12 to age 18: longitudinal, cross-sectional, and cross-cultural analyses. *J Pers Soc Psychol* (2002) 83:1456–68. doi: 10.1037/0022-3514.83.6.1456
69. Woo CW, Chang LJ, Lindquist MA, Wager TD. Building better biomarkers: brain models in translational neuroimaging. *Nat Neurosci.* (2017) 20:365. doi: 10.1038/nn.4478

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2018 Zaninotto, Qian, Sun, Bassi, Solmi and Salcuni. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



Rorschach Assessment in Suicide Survivors: Focus on Suicidal Ideation

Arianna Palmieri^{1,2}, Johann Roland Kleinbub¹, Stefania Mannarini^{1,3}, Sara Molinaro¹, Cristina Castriotta⁴ and Paolo Scocco^{4,5*}

¹ Department of Philosophy, Sociology, Education and Applied Psychology, University of Padova, Padova, Italy, ² Padova Neuroscience Center, University of Padova, Padova, Italy, ³ Interdepartmental Center for Family Research, University of Padova, Padova, Italy, ⁴ Soprox Onlus, Padova, Italy, ⁵ Mental Health Center, ULSS 6 Euganea, Padova, Italy

OPEN ACCESS

Edited by:

Jian-Bin Li,
The Education University of
Hong Kong, Hong Kong

Reviewed by:

Shahanawaz Syed,
University of Hail, Saudi Arabia
Chiara Conti,
Università degli Studi G.
d'Annunzio Chieti e Pescara, Italy

*Correspondence:

Paolo Scocco
paolosocco61@gmail.com

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 13 September 2018

Accepted: 21 December 2018

Published: 11 January 2019

Citation:

Palmieri A, Kleinbub JR, Mannarini S,
Molinaro S, Castriotta C and
Scocco P (2019) Rorschach
Assessment in Suicide Survivors:
Focus on Suicidal Ideation.
Front. Public Health 6:382.
doi: 10.3389/fpubh.2018.00382

Background: The study of Suicidal ideation (SI) in people bereaved through suicide (Suicide Survivors, SSs) could be hampered by the person's willingness to admit it, or by their limited awareness of it. Our main hypothesis is that SI is common in these people, especially if they are parents or children of the victim. For its potential in shedding light on specific unconscious processes, Rorschach test was chosen for our investigation, for the first time in SSs literature. Rorschach suicide ideation and selected variables were further analyzed to better delineate their psychological profile.

Method: Rorschach according to Exner's Comprehensive System was administered to 21 people bereaved through suicide presenting as outpatients at SOPROXI Project Service—Padova Mental Health Center- and 23 healthy controls. Beck Depression Inventory (BDI) was routinely administered to SSs and considered in the study.

Results: T-tests showed significantly higher mean SI score (S-Con) as it emerged from the Rorschach test S-Con scores in SSs compared to control participants. SI found only weak correlation with the BDI item in which SSs can explicitly state the desire for their death. Within-group analysis revealed higher S-Con mean scores in bereaved children and parents of the victim compared to other kind of kinships. Morbid content (MOR) has been found as the most characterizing variable in SSs' S-Con in terms of effect size, followed by a low number of responses with an ordinary form (X +%). Human movements (M), Special Scores related to thought slippage (ALOG, FABCOM2, INCOM2, and CONTAM) and poor human representations (PHR) have been shown to be more significantly present in SSs compared controls.

Discussion: Psychodynamic interpretations of our results are provided. Clinical practice should consider Rorschach as one of eligible tools of investigation on this field.

Keywords: suicide, survivor, Rorschach, suicidal ideation, health risk

INTRODUCTION

A person who lost a friend, family member, or other loved ones through suicide have been also defined as suicide survivor (SSs). It has been described that a great percentage of SSs reported that the suicide of the one's beloved had significantly "disrupted" their lives (1).

According to an anecdotal figure often reported in literature spanning the last 30 years, about six people are left behind following every suicide. However, a recent study by Cerel et al.

(2), on a huge U.S. sample, calculated that each suicide resulted in an average of 135 people exposed (i.e., who knew the deceased person) during their lifetime (resulting, in that case, in 5.5 million of people only in the Kentucky State).

This estimation provides an idea of the strong need of deepening the comprehension of the psychological consequences of being a person bereaved through suicide, in order to inform and guide the clinical practice.

A comprehensive review by Sveen and Walby (3) suggested that SSs report higher levels of rejection, shame, stigma, and blaming than other bereaved people, while sharing with them complicated grief, depression, PTSD symptoms, anxiety, and suicidal behavior. Among the psychological reactions to the loss of a beloved person, suicidal ideation (SI) has indeed been identified as one of the prominent features in SSs and it is still a challenging topic in this field. For instance, one of the first empirical contribution on SI in people bereaved through suicide, by Mitchell et al. (4), showed a strong association between complicated grief and SI, also controlling for depression levels.

More recently, in a large-sample study, Pitman et al. (5) found that SSs have a significantly increased risk of SI and suicide attempts compared with people bereaved by other sudden deaths. A possible issue in investigating the prominence of SI in this population is the fact that SI is generally hidden or neglected by a resistance to admit it or even acknowledging it (6–9).

In line with recent literature (4, 5, 10–12, 12–21), we hypothesize greater SI in people bereaved through suicide compared to a healthy control group. Specifically, we intend to investigate SI through a projective test able to assess this clinical phenomenon even overcoming the participants' conscious or unconscious resistance to its expression, i.e., Rorschach Inkblot test coded and interpreted according to Exner's Comprehensive System (22, 23). We choose the Rorschach Inkblot test as it is based on the assumption that conscious and unconscious ways of feeling and thinking (namely cognitive, perceptual, affective, problem-solving, and coping resources) are reflected (projected) on the ambiguous materials of the test which can provide data about the person's functioning in the immediate present (24). According to a recent review by Kumar et al. (25), in the last 50 years the Rorschach test has been the most widely employed projective measure used to assess SI (22, 26, 27). Rorschach test has also indeed been employed extensively in recent studies to characterize psychiatric populations and/or people suffering from seriously impacting bereavement [e.g., (28–33)], revealing psychological characteristics of patients who had escaped the research classically based on self-report questionnaires. For instance, Palmieri et al. (31) assessed with Rorschach test people affected by Amyotrophic Lateral Sclerosis, a terminal disease in which patients must face the anticipated mourning of themselves, highlighting greater SI than expected on the basis of self-report questionnaires or interviews (namely one third of the patients recruited in the sample showed high SI).

In detail, the CS is employed by 96% of health professionals using the Rorschach test (34), and contains a variables constellation specifically addressed to assess SI. Such constellation, named "S-Con," demonstrated considerable

predictive validity of self-destructive behaviors as well as near-lethal and lethal suicide behaviors (22, 26, 27, 35). Exner (22) reported that S-Con has been able to identify around 75% of suicidal patients (22). Hence, S-Con score was chosen as our main dependent variable. We expect only partial convergence between the patient's S-Con score and their explicitly expressed desire for death, considering interpersonal and intrapsychic resistance related to suicidal ideation.

To substantiate the hypothesized discrepancy between the SI and its explicit expression, we used Beck Depression Inventory [BDI; (36)], routinely administered to these outpatients, by comparing their S-Con score and the score obtained at the BDI 9th item, which regards the idea of putting an end to one's own life. Our second hypothesis is that the expected greater SI in SSs participants, depends on the kinship with the deceased person, in terms of increasing SI if the victim is a child or a parent. The literature has already provided some elements to support the hypothesis that strict relatives bereaved by suicide may be at particular risk for suicide themselves (12, 13, 15, 18–21, 37).

Namely, it has been proved that a family history of suicide increases up to ten times the suicide risk in the family members (21) compared to the risk of general population, independently of possible inherited vulnerability for mental disorders shared with the victim (18). Recently, Campos et al. (13) and Santos et al. (19) found that, in a large European sample of SSs, being a strict relative of the suicided person, significantly contributed to the suicide risk. Similar results were found in Asian population: Song et al. (37) found that individuals who lost a family member have in their lifetime 4.5 times more probability of SI, whereas if the victim was a friend or an acquaintance the SI probability was, respectively 3.7 times and 2.2 times that of people without such experience.

Finally, to provide a more exhaustive picture, our third aim is to deepen into patients' Rorschach protocols. In the third part of the manuscript we present in detail all the S-CON variables scores to highlight which is the most characterizing SSs in such a constellation. In order to offer a profile of such population and to deeper investigate the way in which patients conceive others and relationships, we also investigated illogical combination of ideas (FABCOM2, INCOM2, CONTAM, ALOG), and poor human representations (PHR) as crucial variables to better delineate patients' ways of feelings and thinking, and total human movements responses (M), crucial, in our opinion for clinical practice in such at-risk population (details in Method section). Our expectation was that these variables were more frequent in patients than the control group. If significantly more present, these indexes would indicate a disturbance of thought, typical of patients who suffered a severe trauma and those at risk of suicide, aggression and dysphoric feelings in perceiving themselves and relationships with others, but also great resources in particular entering into empathic resonance with others, a typical aspect of those who survived from trauma suffering (38, 39). In detail, we introduced the latter variable, M, together with the other ones strongly aimed at highlighting psychopathological aspects, to investigate also the presence of a positive feature that could represent a basis for the reflection on the psychological interventions' planning in favor of these patients.

In synthesis, we mainly aimed to investigate the implicit suicidal ideation in SSs patients through the administration of a projective test, the Rorschach Inkblot Test based on CS.

Our first hypothesis was that the Suicide Constellation score should be higher in these patients compared to healthy controls. Furthermore, we compared patients S-CON's score to the score of one specific item of the BDI, expecting a lack of clear association between the explicit and projective-based assessment of SI.

Secondly, we hypothesized a higher S-CON score in the case of being a parent or a child of the suicide victim, compared to other kind of bonding.

Thirdly, to further delineate SSs profile, we deepened on S-Con variables to individuate which are the most characterizing this sample, and investigated further variables expected as peculiar in people bereaved through suicide.

To the best of our knowledge, this is the first study exploring SSs psychological features through a projective test: identifying, with such kind of assessment, the common features of people bereaved through suicide, mainly those related to SI, could be provided an original perspective helpful both for research and for clinical practice.

MATERIALS AND METHODS

Participants

Between 2015 and 2017, eligible SSs were recruited consecutively from user of SOPROXI Project (40, 41). Soproxiproject (www.soproxiproject.it) was established in Padua, Italy, in 2006, to offer information, support, treatment provision, awareness-building and educational campaigns, to people -mainly relatives and friends- who have experienced the suicide of someone close.

Inclusion criteria of our experimental sample were: be at least 18 years old, have lost someone close by suicide and be able to reach the outpatient office of Soproxiproject at the Mental Health Center (Padova Hospital). Exclusion criteria were the presence of a frank cognitive impairment or other impediment to the understanding of the Italian language.

The Rorschach test according to CS procedure was administered to all 22 selected people according to inclusion and exclusion criteria. Since brief protocols (number of responses $[R] < 14$) are considered invalid, as Exner (42) reported that the temporal stability of CS scores was lower when the Rorschach protocols had fewer than 14 responses, one SSs' protocol was excluded from the study, resulting in 21 valid protocols.

Twenty-one control subjects were then recruited mainly from local voluntary associations. Same SSs inclusion and exclusion criteria were applied. No statistical differences were found between the two groups in terms of age, $t_{(39,37)} = -0.39$, $p = 0.697$, educational level, $t_{(38,47)} = 0.15$, $p = 0.884$, and gender distribution $\chi^2_{(1, N=42)} = 0$, $p > 0.999$. All demographic data are reported in Table 1.

Measures

Rorschach Test and Selected Variables

All Rorschach systems use the same set of 10 inkblot stimuli originally created by Rorschach (43), in which examinees are invited to look at each inkblot and say what it looks like or

TABLE 1 | demographics.

	Patients		Controls	
	Mean	SD	Mean	SD
Age (years)	46.05	12.48	47.67	14.18
Education (years)	12.9	4.61	12.71	3.77
Gender	F = 16 M = 05		F = 15 M = 06	

what it might be, giving one or more responses per inkblot. The Rorschach Comprehensive System [CS; (44)] we used in our study includes the CS suicide constellation "S-Con" (23), on which we focused our study, is an index composed by the number of variables exceeding (or being comprised within) specific threshold values, among a set of 12 variables (Sum VF + FD > 2; C-S Bl > 0; Ego > 0.31 > 0.44; MOR > 3; Zd > ± 3.5 ; es > EA; CF + C > FC; X+ % < 70; S < 3; P < 3 > 8; Pure H < 2; R < 17); a value equal or > 8 in S-Con is considered as a cut-off sensitive in detecting people with significant suicidal ideations on the basis of empirical findings. Hence, it is suggested that the protocol of any person reaching the S-Con cut-off must be taken very seriously [for further details see (45–47)]. Namely, according to Mihura et al.' recent seminal review, the interpretation of each S-con variable can be synthesized as follows: high Vista and Dimension responses (Sum V + FD), which stand for depth perceived by gradations of dark and light or by shape, reflect negative self-perception, feelings of discomfort, jointly with personal introspection; high color over form responses (FC < CF + C) reflect self-control failure by an external or internal stimulation, placed by an exaggerated emotional reaction; High color shading blends (C-S Bl), which stands for color and its shading as seen simultaneously, reflects simultaneous experiencing joy and pain; Low Conventional Ordinary Form Quality (low X+ %), which stands for low number of conventional perceptions of blot areas, reflects abnormal ability to perceive the world as others do, and maybe impaired reality testing; very high or very low Ego Index, which is a composite measure based on the number of reflections and pairs of objects, may be associated with an impaired ego organization and a capacity to meet internal and external demands and stressors: the Ego index can be either narcissistic or distress related (when high) or related to a negative self-image (when low); high white responses (S), provided when white background space is used in the response, reflects oppositional tendencies, and feelings of anger and aggression; High responses with damaged, dysphoric or morbid content (MOR) reflect morbid imagery and are associated with depressive and/or destructive thoughts or feelings; low or high Popular responses (P; i.e., the 13 most statistically common objects reported by at least one third of the normative sample) reflect, when low, unusual and, when high, stereotyped perceptions of reality; high or low scores in the processing efficiency (Zd), reflects, respectively excessive or impaired information processing or accounting; a low number of Images of whole, realistic human figures (Pure H), reflects an impaired perception of Self and others viewed as whole;

Experienced Stimulation greater than Experience Actual ($es > EA$) reflects the current level of coping abilities in terms of experiencing more stress than what can be handled; finally a low number of total responses given to the whole protocol (R) reflects a limited ability to provide ideas, or solutions to a given issue.

Further four variables were considered in our analysis: the number of Human Movements (M), which reflect, respectively mental abilities (i.e., planning, empathic behaviors); moreover, since impaired reality testing and illogical combination of ideas can occur in loss and dysphoria, we grouped indices reflecting more serious forms of cognitive disarray (i.e., incongruous combination, INCOM level 2 + Fabulized combination, FABCOM level 2 + Contamination, CONTAM); finally, we considered poor Human Representation (poor H), i.e., Human or quasi-human images that are illogical, aggressive, damaged, or poorly formed, as they reflect disturbed and maladaptive understanding of others.

Beck Depression Inventory

The BDI (36) is one of the most widely used self-report inventory for measuring the severity of depression. It consists of 21 item on a 4-points Likert scale in which a score of 0 corresponds to “I don’t have any thoughts of killing myself,” 1 corresponds to “I have thoughts of killing myself, but I would not carry them out,” 2 corresponds to “I would like to kill myself” and 3 corresponds to “I would kill myself if I had the chance.”

Procedure

The assessment took place in a clinical setting, and careful efforts were provided to make available for the participants emotional support during the interview. The Rorschach was administered by S.M (fourth author), a psychologist trained on Rorschach CS (third author of the study). The test administration lasted about 90 min.

Patients were given the choice to receive a brief report on the findings from their Rorschach protocol. Nine of them asked for it and received a written report. In 4 cases among these 9, patients requested and obtained a further clinical interview to discuss the reports content.

Since the BDI (36) was routinely administered to SSs attending at outpatient office of Soproxi project at the Mental Health Center, the item 9 of the inventory was employed as a measure of explicit expression of own death thoughts.

At the end of the whole process, five patients’ protocols and five controls’ ones were chosen at random and re-scored independently by the first author (A.P.), who was unaware of the fourth author’s (S.M.) scores and was blind on the group belonging. The two sets of scored protocols were compared, and Kappa values were calculated for S-Con global index (Kappa = 0.94), M (Kappa = 1.0), and M- (Kappa = 1.0). Rater agreement on scoring the four signs was very high, demonstrating that these psychodynamic Rorschach variables can be reliably scored. Furthermore, for those who have overcome the clinical cut-off of suicidal ideation (namely, 3 people bereaved by suicide), team meetings have been held and,

depending on the case, particular clinical attention has been dedicated to the theme of suicidal ideation in subsequent clinical interviews. Of note, all them had previously asked the Soproxi clinical team for a psychotherapy or clinical supportive aid. Informed consent to the aims of the study was obtained from each individual participant, in accordance with the guidelines of the 1995 Declaration of Helsinki [as revised in (48)]. This Soproxi Project has been approved by Ethics Committee of Clinical Experimental Projects of Padova Hospital (protocol number 0020095).

Statistical Analyses

Cohen’s Kappa was used to assess interrater reliability. One-tailed *t*-tests, using Welch approximation to the degrees of freedom for unequal variances, were performed to assess the difference in S-Con mean scores, respectively between patients and control participants and, between people bereaved through suicide that were parents or sons vs. other type of kinships with the victim. Further *t*-tests were performed to assess the difference between patients and controls in the M and PHR indexes, as well as a composite index obtained by the sum of Incom2, Fabcom2, and Contam indexes (IFC).

To further describe the difference between people bereaved through suicide and control groups, Cohen’s *d* (49) for all S-Con components were reported to provide a standardized comparison scale. Extending the original classification of Cohen (49); Sawilowsky (50) provides the following classification of *d* values, which was employed in the analyses: *d* (0.01) = very small, *d* (0.2) = small, *d* (0.5) = medium, *d* (0.8) = large, *d* (1.2) = very large, and *d* (2.0) = huge.

RESULTS

Statistical analyses showed a significant difference, $t_{(39,69)} = 2.45$, $p = 0.009$, between the S-Con scores of SSs ($M = 5.95$, $SD = 1.77$) and control participants ($M = 4.67$, $SD = 1.62$), with patients having higher scores than controls, and a medium to large effect size ($d = 0.76$). Moreover, of 21 bereaved people who received the Rorschach test, 3 exceeded the cut-off rate of 8 score for the suicide ideation level, and 8 obtained a sub-threshold score between 5 and 7. In the control consisting of 23 subjects instead, instead no individual exceeded the cut-off, 5 subjects scored 5 and 2 scored 6.

The correlation between patients’ BDI suicidal ideation item and their S-CON scores was found to be weak ($r = 0.29$). Moreover, the within patient’s analysis showed a significant effect of kinship with the victim, $t_{(18,85)} = 3.11$, $p = 0.003$, with the sons or parents ($M = 7.00$, $SD = 1.33$) having a greater S-Con score than other type or relatives ($M = 5.00$, $SD = 1.61$), the Cohen’s *d* = 1.35 indicates a very large effect.

“M” scores were found higher in SSs ($M = 2.6$, $SD = 2.27$) than in control participants ($M = 0.79$, $SD = 0.85$), $t_{(25,54)} = 3.43$, $p = 0.001$, with a large effect size ($d = 1.06$); PHR scores showed a similar result, $t_{(29,31)} = 3.45$, $p < 0.001$, with patients ($M = 4.95$, $SD = 3.57$) showing higher scores than controls ($M = 1.95$,

TABLE 2 | Scores of S-Con components by group.

	Patients		Controls		Cohen's d	
	Mean	SD	Mean	SD		
sumVFD	1	0.95	1.55	1.59	0.42	Small
ColShdBI	8.24	4.68	6.48	4.64	0.38	Small
EgoIndex	0.42	0.24	0.35	0.16	0.33	Small
MOR	3.86	2.39	0.62	0.97	1.77	Very large
Zd	-1.55	5.78	-2.93	3.21	0.3	Small
esEA	5.62	6.19	4.07	6.92	0.24	Small
CFpCmFC	0.46	1.86	0.05	2.03	0.21	Small
X+%	41.24	13.69	52.62	14.88	0.8	Large
S	5.38	2.94	3.33	2.44	0.76	Medium
P	4.33	1.49	5.14	1.11	0.62	Medium
PureH	2.57	1.66	2.24	1.26	0.23	Small
R	26.62	8.63	23.38	7.53	0.4	Small

$SD = 1.77$) and a large effect size ($d = 1.06$). Finally, the IFC composite index results showed patients ($M = 0.81$, $SD = 1.12$) presenting a positive mean score, while all control participants scored zero, $t_{(20)} = 3.3$, $p = 0.002$, $d = 1.02$.

Descriptive statistics and effect sizes of all S-Con components are reported in **Table 2**.

Ten patients scored "0" on the selected BDI item, other ten patients reported a score of "1," and there was one response "2" and no response "3." The correlation between this measure and S-Con scores was low, $r = 0.22$.

DISCUSSION

In line with our main hypothesis, we found a greater SI in patients bereaved through suicide when compared to control participants as assessed with Rorschach test according Exner's System, consistently with recent literature findings on the topic of SI in SSs (4, 5, 10–21, 37).

Of note, the presence of elevated suicidal ideation does not correspond *sensu strictu* to the consequent manifest suicidal act. It has been indeed documented the existence of a continuum in severity in suicidal ideation and behavior, ranging from death thoughts to suicide planning, with behaviors (attempted and completed suicide) being less frequent phenomena, that is the majority of people do not act on their suicidal ideation (7, 9, 51, 52). In this vein, Viglione and Hilsenroth (35), suggest the S-Con should not be used to rule out suicide risk but to increase awareness about self-destructive behavior and suicide. Both false-positives and false-negatives are indeed possible during objective assessments. From a health professional's point of view false positive in the domain of suicide assessment is not very disturbing but any false-negative case is a matter of grave concern. A false-negative case on objective assessment implicates that the individual has suicidal ideations but does not express it explicitly. In such situations, the use of projective tests becomes more important as on the ambiguous stimuli of these tests, the individual may indicate his/her suicidal ideations.

Anyhow, the high presence of this type of ideation in the SSs group also confirmed with the investigation based on a projective test confirms the intensity of this type of ideation and the need to further deepen this issue in people bereaved thorough suicide. The mental processes that are activated in the production of Rorschach responses, indeed, tap into and trigger the underlying personality structures of the respondent, which are not captured by self-report measures or interviews (53) because self-reports depend on the respondents' willingness to reveal the asked-for information about themselves, their perceived risk by revealing certain information, such as SI, and their self-knowledge.

We also found a lack of clear association between the score obtained with the S-Con and what was explicitly stated at item 9 of the BDI related to the desire for one's own death.

This fact corroborates the idea that IS in SSs may be outside of awareness, or there may be a strong resistance to admit it. According to scientific literature on the topic of suicide as a whole, thirty-seven of the patients attempting suicide had communicated their suicidal intentions to people around them, but all of them used only protracted indirect verbal communication (9). About one-third to one-half of all suicide victims have communicated their intent to family members, and a roughly similar proportion to health care professionals during the final few months (7). Furthermore, research has shown that the majority of high school students would tell a friend if they were thinking of suicide, not a parent or counselor (6, 8). In general perspective, it has been shown that there is a profound discrepancy between conscious and unconscious level regarding one's own mental states and the concept of health (54–56), especially in clinical subjects (57). This could indeed lead to underestimate the magnitude of the phenomenon, which could be even more pervasive than commonly thought.

Moreover, consistently with our second hypothesis, i.e., that within our group of people bereaved through suicide, being a parent or child of a suicide victim generates more SI than other types of relationship / kinship also according to Rorschach test results, the association with S-Con Score was significantly higher in the case of being a parent or a child of the victim.

Scientific literature has already provided evidence in this direction (12, 13, 15, 18–21, 37), noting associations between levels of psychopathology and degree of kinship with the victim of suicide. Even in these cases, however, the survey was based on self-report measures or by means of interviews based on explicit questions, and never before with the use of a projective measure.

The psychodynamic perspective can provide a meaningful interpretation of this second result, i.e., that being a parent or child of a suicide victim is associated to higher SI than other types of relationship / kinship. In the classical psychodynamic interpretation (58) the concept of secondary identification to which we refer in the following, typically occurs in mournful experiences: it allows the lost object (suicidal person, in this case) to survive in the ego of the one who remains. In this vein, the dynamic of identification in the parent-child relationship is intensely present and reciprocal in the parent-child transgenerational axis, and characterize, at different level, various stages of evolutionary development (59). In

“Mourning and Melancholia,” Freud (58) theorized that the loss of a loved object generates an unconscious identification with that object, ambivalently perceived both desirable (i.e., “good”) than abandoning (i.e., “bad”). The outcome of this pathological identification is an unconscious confusion between the self and the lost object. In that process, some aspects of the ego are split-off and come to represent the abandoning object. Hence, aggressive feelings toward that lost, abandoning object are directed against the split-off aspect of the ego which serves as a stand-in for the object. These hostile feelings directed against the self can result in self-destructive fantasies. In the case of death by suicide, this dynamic can be particularly intense because, unlike other casual death or loss, the suicide victim—the lost object—appears to be a person who has consciously and voluntarily chosen to abandon his/her loved child or parent. In a further psychodynamic interpretation (60, 61), the introjected aggression toward the original love object is enlisted by the Super-ego, fueling attacks against the ego. In this formulation the Super-ego, in which arises sense of guilt and desire of auto-punishment, acts a relentless attack on the ego. In this case as well, the psychic dynamics can be exacerbated in the people bereaved through suicide, in which the sense of inadequacy and guilt for not having done enough to save the suicide victim from the choice of the extreme act can be enormous in the case of a children or a parent. Asch’s words (62) elegantly sum up this perspective: “much of the meaning of the usual suicidal act can be understood once we recognize that there is frequently a double aim of first cleansing the self, and then uniting (actually reuniting) with an omnipotent love object” (p. 52).

In line with this psychodynamic premise, it follows that suicidal ideation can be more activated when the suicide victim is a child or a parent. In the first case, it is perhaps superfluous to say that surviving one’s own children represents a huge conflict, and it is common clinical experience that is perceived by the parents as being “against nature.” Even more, when the child voluntarily chooses to end his life, this act can be perceived by the parents as an existential failure. The literature has in fact been very dedicated to this theme, highlighting the particular drama of this condition (12, 13, 15, 18–21, 37). In the second case, relating to the death by suicide of a parent, the drama and the anger facing the self can be similarly enormous, because the SS was not able to save the life to who gave life to him/her.

As a third objective of our study we were focused in investigating the S-Con variables resulting to have the widest effect size. The greatest one is the morbid content (MOR), revealing as the most characterizing variable among those constituting S-Con in our SSs sample. MOR is a code used for any response in which an object is identified as dead, destroyed, damaged, injured, or characterized by clearly dysphoric feeling (63). As MOR responses pertain most directly to issues of self-image, its incisive presence signals that patients’ thinking is marked by a pessimistic set, thus implicating a tendency to conceptualize the self and the relationship to the world with a sense of discouragement. Exner (63) highlight that when MOR is particularly high in a protocol, pessimism can be joint to disorganized ideation. Interestingly, as Since S-Con has been validated only in adult population, Silberg and Armstrong (27)

searched for an experimental index designed to detect SI in adolescents, founding that MOR, alone, discriminates suicidality in adolescents as well. In trauma research literature, particularly rich in empirical studies based on evaluation with the Rorschach test, MOR content variables have been indeed often associated with traumatic experiences (64) and it has been included in the “Trauma Index” (65). Our result is therefore in line with the pathognomonic relevance that the MOR index has also revealed in other contexts of study.

The second variable revealing a remarkable effect size among those of S-Con is Conventional Ordinary Form Quality (X+%), with mean SSs’ mean scores lower than those of controls. The X+% represent the proportion of formal ordinary responses in the protocol. When its score is within normal range, it means that the person mediational decisions tend to be common or conventional. When it is low, as in this case, it signifies that the person tends to translate stimulus field in atypical ways. Such a prominence in SSs can be usefully interpreted jointly to the other selected indices besides S-Con. In detail, the sum of indices reflecting severe cognitive disarray (INCOM level 2 + FABCOM level 2 + CONTAM). As a whole, the occurrence of these marked in SSs variables can reflect an impaired reality testing and thought disorder, similarly to what has been often found in trauma research based on Rorschach assessment (66, 67). Ephraim (68) highlight, in this vein, that cognitive disturbances are associated with intrusive recollections, and underlined the importance of acknowledging their trauma-related nature, seen as important indications of the potential perceptual idiosyncrasies and difficulties with reality testing of traumatized individuals, as in the case of SSs.

A higher number of poor Human representations (PHR), namely human or quasi-human images that are illogical, aggressive, damaged, or poorly formed were found, as expected, in our SSs Sample compared to controls. In this vain, Varvin and Rosenbaum (69) argued that the experience of helplessness and object loss are the two most salient aspects of psychological trauma. This concerns both the loss of important objects in the external world and the loss of what is conceptualized as internal representations of comforting objects.

This aspect is particularly fitting in the psychic dynamics that typically can involve a suicide survivor, as described in detail above.

Finally, as hypothesize, Human Movements (M) were found as higher in SSs compared to control subjects. M is mostly interpreted as an indication of resources, commonly related to how people view themselves and others and to empathy: an association between the presence of M responses and the activation of the mirror neural mechanism was indeed found (32), corroborating such evidence. As stated by Weiner (70), it might be the single component of the test most revealing of the individual’s role in interpersonal relationships. Therefore, the high presence of M responses could suggest the presence of a marked sensitivity of SSs, typical of people who understand the pain of others because they have experienced direct trauma and loss: such attitude has been highlighted both in clinical and in neuroscientific perspective (38, 39).

In summary, as regards the third purpose of this study, the variables among those that seem to best characterize the constellation of suicidal ideation are the responses with morbid content (MOR), which reflect an image of oneself and of the damaged and dysphoric world, and the low number of ordinary form content, reflecting a distort, or at least unconventional, individuals' perception of the world. Consistently with the analyses of the other selected variables, marked illogical thinking, higher when compared to that of control group, indicating "traumatic thought disorders" emerged in our SSs sample. It can be seen as important indications of the potential perceptual idiosyncrasies and difficulties with reality testing by SSs, jointly to a distorted perception of the self and the others, probably characterized by anger.

The significant presence of these indices, as a whole, is well suited to the characteristics already described in these SSs, as previously emerged from self-report measures studies, such as depression, complicated grief and PTSD symptoms, other than suicidal ideation [e.g., see (3), for a review]. In these psychopathological frameworks, apparently distinct, some clinical signs and symptoms overlaps in terms of negative thoughts about yourself, other people or the world, self-destructive behavior, irritability, angry outbursts, or aggressive behavior, and distorted perception of reality caused by numbness or detachment.

The indices provided by our Rorschach study could hence represent, in future research, the starting point for identifying a composite index or a pathognomonic constellation useful to systematically detect the main psychopathological cues of suffering in SSs.

Of note, positive signs of marked empathic abilities and high cognitive resources were also found, as expected, in our sample. In this vein, Cerel and colleagues yet underlined SSs' motivation to help others like themselves (71), highlighting the fact that support groups are the most frequently utilized form of treatment for most people bereaved by beloved one's suicide. However, with a few exceptions, the investigation of the SSs' positive psychological resources is almost always placed in the background in research, which is mainly aimed at investigating their psychopathological reactions. It should be also considered that scientific literature is very fruitful in the study of psychological prevention and postvention of SSs [for a review see (3)], but many of the studies aimed at testing the effectiveness of the interventions are inspired by the main patients' psychopathological cues to outline targeted interventions, as in the case, for instance, by Testoni et al. (72), who suggest to focus on forgiveness toward the facilitation of the elaboration of self-blame.

Acting with awareness, non-judging and non-reacting seem to be dimension with a protective effect on psychological distress in SSs; for this reason, Mindfulness-based weekend retreats could be a further effective intervention in alleviating the suffering of this particular population of users (73).

To improve the patient's condition focusing indeed on the pathological dimensions and on the source of suffering is undoubtedly the main road on planning efficacious psychological intervention; however, to implement clinical approaches also

considering the individuals' peculiar resources could represent a strength point in an effective intervention planning strategy. In this case, the SSs' ability to empathize and the cognitive complexity wealth inherited from their suffering, as evidenced by the high number of M responses, could be a potential starting point the intervention strategies.

In conclusion, one of the main messages that this article intends to provide is to not underestimate the SI in the SSs, even when this was explicitly denied by them, especially if the victim of suicide is a parent or a child. Rorschach test scored and interpreted according CS (22), can represent a useful tool in such a psychodiagnostic investigation.

As recently emerged in the study by Pitman et al. (5), indeed, the physical health of SSs is poor, and odds mortality ratio are higher to those reported in the normal population. In this context, one of the future research directions could be aimed at better investigating the causes of the mortality of SSs. It is not possible, in fact, to exclude in some situations the presence of "masked suicides," or that people unconsciously risk their physical safety without incurring a deliberate suicidal act, according the unconscious psychodynamics described above, that would lead to a reunion with the loved object putting at the same time an end to the pain and supporting self-punitive drives (58, 60, 62). Among the many implications on health care which arise from our argumentations, the hospital staff and its setting, in particular the psychiatric one, to which patients bereaved by suicide often address to, has a pivotal role. As stated by Jordan and McMenamy (74), the psychiatric hospital setting is one of the elective setting for diagnosis and for the planning of treatments -both at the psychotherapy and pharmacotherapy level- for this population which, in turn, is at risk of suicide.

Our study suffers from some limitations, such as the reduced number of subjects recruited in our clinical sample and the lack of an additional control group, in addition to that constituted by healthy subjects. A third representative group of a bereaved people for sudden loss of loved ones in a different way from suicidal act would have allowed a comparison useful to better delineate the specific characteristics of SSs' sample. Further studies are warranted to fill the questions that these limits can inherently raise. A further limitation of the study is to have investigated a population of bereaved by suicide who asked for a psychological support, therefore only partially representative of the entire population of the SSs.

Despite these limitations, our first study using the Rorschach test in the people bereaved by suicide is hoped to have contribute to better delineate some psychological characteristics of these individuals, and in particular to focus the attention of health professionals toward the need to actively assess and be vigilant mainly in terms of suicidal ideation in at-risk population such as suicide survivors.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this manuscript will be made available by the authors, without undue reservation, to any qualified researcher.

AUTHOR CONTRIBUTIONS

AP and PS designed the study and interpreted the results. PS, SaM and CC carried out the study and acquitted the data (with the direction of PS). JRK and StM conceived the statistical design and performed the data analyses. AP wrote the main part of the article. All authors helped to shape the research,

critically revised the article and gave their final approval.

ACKNOWLEDGMENTS

We are grateful to Fabia Procarione, Federica Caccia, Francesca Cavana and Guia Nerli for their precious help in collecting data and systematized data set.

REFERENCES

- Cerel J, Maple M, van de Venne J, Moore M, Flaherty C, Brown M. Exposure to suicide in the community: prevalence and correlates in one U.S. State. *Public Health Rep.* (2016) 131:100–7. doi: 10.1177/003335491613100116
- Cerel J, Brown MM, Maple M, Singleton M, van de Venne J, Moore M, et al. How many people are exposed to suicide? Not six. *Suicide and Life-Threatening Behav.* (2018). doi: 10.1111/sltb.12450. [Epub ahead of print].
- Sveen CA, Walby FA. Suicide survivors' mental health and grief reactions: a systematic review of controlled studies. *Suicide Life-Threatening Behav.* (2008) 38:13–29. doi: 10.1521/suli.2008.38.1.13
- Mitchell AM, Kim Y, Prigerson HG, Mortimer MK. Complicated grief and suicidal ideation in adult survivors of suicide. *Suicide Life-Threatening Behav.* (2005) 35:498–506. doi: 10.1521/suli.2005.35.5.498
- Pitman AL, Osborn DP, Rantell K, King MB. Bereavement by suicide as a risk factor for suicide attempt: a cross-sectional national UK-wide study of 3432 young bereaved adults. *BMJ Open* (2016) 6:e009948. doi: 10.1136/bmjopen-2015-009948
- Hennig CW, Crabtree CR, Baum D. Mental health CPR: peer contracting as a response to potential suicide in adolescents. *Arch Suicide Res.* (1998) 4:169–87. doi: 10.1023/A:1009672330315
- Isometsä ET. Psychological autopsy studies—a review. *Eur Psychiatry* (2001) 16:379–85. doi: 10.1016/S0924-9338(01)00594-6
- Ross CP. Teaching children the facts of life and death: Suicide prevention in the schools. In Peck M. L., Farberow N. L., and Litman R. E., editors, *Youth Suicide*. New York, NY: Springer (1985). p. 147–69.
- Wolk-Wasserman D. Suicidal communication of persons attempting suicide and responses of significant others. *Acta Psychiatrica Scand.* (1986) 73:481–99. doi: 10.1111/j.1600-0447.1986.tb02715.x
- Agerbo E. Midlife suicide risk, partner's psychiatric illness, spouse and child bereavement by suicide or other modes of death: a gender specific study. *J Epidemiol Community Health* (2005) 59:407–12. doi: 10.1136/jech.2004.024950
- Bolton JM, Au W, Leslie WD, Martens PJ, Enns MW, Roos LL, et al. Parents bereaved by offspring suicide: a population-based longitudinal case-control study. *JAMA Psychiatry* (2013) 70:158–67. doi: 10.1001/jamapsychiatry.2013.275<underline
- Brent DA, Melhem N. Familial transmission of suicidal behavior. *Psychiatric Clin North Am.* (2008) 31:157–77. doi: 10.1016/j.psc.2008.02.001
- Campos RC, Holden RR, Santos S. Exposure to suicide in the family: Suicide risk and psychache in individuals who have lost a family member by suicide. *J Clin Psychol.* (2018) 74:407–17. doi: 10.1002/jclp.22518
- Crosby AE, Sacks JJ. Exposure to suicide: incidence and association with suicidal ideation and behavior: United States, 1994. *Suicide Life-Threatening Behav.* (2002) 32:321–8. doi: 10.1521/suli.32.3.321.22170
- Goodwin RD, Beautrais AL, Fergusson DM. Familial transmission of suicidal ideation and suicide attempts: evidence from a general population sample. *Psychiatry Res.* (2004) 126:159–65. doi: 10.1016/j.psychres.2004.02.010
- Jordan JR. Bereavement after suicide. *Psychiatric Ann.* (2008) 38:679–85.
- Latham AE, Prigerson HG. Suicidality and bereavement: complicated grief as psychiatric disorder presenting greatest risk for suicidality. *Suic Life Threaten Behav.* (2004) 34:350–62. doi: 10.1521/suli.34.4.350.53737
- Qin P, Agerbo E, Mortensen PB. Suicide risk in relation to family history of completed suicide and psychiatric disorders: a nested case-control study based on longitudinal registers. *Lancet* (2002) 360:1126–30. doi: 10.1016/S0140-6736(02)11197-4
- Santos S, Campos RC, Tavares S. Suicidal ideation and distress in family members bereaved by suicide in Portugal. *Death Stud.* (2015) 39:332–41. doi: 10.1080/07481187.2014.946626
- Tal I, Mauro C, Reynolds CF III, Shear MK, Simon N, Lebowitz B, et al. Complicated grief after suicide bereavement and other causes of death. *Death Stud.* (2017) 41:267–75. doi: 10.1080/07481187.2016.1265028
- Kim CD, Seguin M, Therrien N, Riopel G, Chawky N, Lesage AD, et al. Familial aggregation of suicidal behavior: a family study of male suicide completers from the general population. *Am J Psychiatry* (2005) 162:1017–9. doi: 10.1176/appi.ajp.162.5.1017
- Exner JE Jr. *The Rorschach: A Comprehensive System: Vol. 1. Basic Foundations. 3rd Edn.* New York, NY: Wiley (1993).
- Exner JE Jr, Wylie J. Some rorschach data concerning suicide. *J Personality Assess.* (1977) 41:339–48. doi: 10.1207/s15327752jpa4104_1
- McGrath RE. The Rorschach in the context of performance-based personality assessment. *J Personality Assess.* (2008) 90:465–75. doi: 10.1080/00223890802248760
- Kumar D, Nizamie SH, Abhishek P, Prasanna LT. Identification of suicidal ideations with the help of projective tests: a review. *Asian J Psychiatry* (2014) 12:36–42. doi: 10.1016/j.ajp.2014.07.004
- Fowler JC, Hilsenroth MJ, Piers C. An empirical study of seriously disturbed suicidal patients. *J Am Psychoanal Assoc.* (2001) 49:161–86. doi: 10.1177/00030651010490010901
- Silberg JL, Armstrong JG. The Rorschach test for predicting suicide among depressed adolescent inpatients. *J Personality Assess.* (1992) 59:290–303. doi: 10.1207/s15327752jpa5902_6
- Balottin L, Mannarini S, Candeloro D, Mita A, Chiappedi M, Balottin U. Rorschach evaluation of personality and emotional characteristics in adolescents with migraine versus epilepsy and controls. *Front Neurol.* (2018) 9:160. doi: 10.3389/fneur.2018.00160
- Calvo V, Bianco F, Benelli E, Sambin M, Monsurrò MR, Femiano C, et al. Impact on children of a parent with ALS: a case-control study. *Front Psychol.* (2015) 6:288. doi: 10.3389/fpsyg.2015.00288
- Mellano D, Salcuni S, Zennaro A, Lis A, Sedona P. Aspetti di personalità di pazienti dermatologici affetti da iperidrosi essenziale rilevati tramite il test di Rorschach valutato col metodo comprensivo di Exner. *Medicina Psicosomatica* (2001) 46. Available online at: <http://www.psychomedia.it/simp/medpsic/articoli/mellano.htm>
- Palmieri A, Sorarù G, Albertini E, Semenza C, Vottero-Ris F, D'Ascenzo C, et al. Psychopathological features and suicidal ideation in amyotrophic lateral sclerosis patients. *Neurol Sci.* (2010) 31:735–40. doi: 10.1007/s10072-010-0332-3
- Porcelli P, Giromini L, Parolin L, Pineda JA, Viglione DJ. Mirroring activity in the brain and movement determinant in the Rorschach test. *J Personal Assess.* (2013) 95:444–56. doi: 10.1080/00223891.2013.775136
- Sultan S, Porcelli P. A critical review on using the Rorschach method in somatic illnesses. *Rorschachiana* (2006) 28:36–57. doi: 10.1027/1192-5604.28.1.36
- Meyer GJ, Hsiao WC, Viglione DJ, Mihura JL, Abraham LM. Rorschach scores in applied clinical practice: a survey of perceived validity by experienced clinicians. *J Personality Assess.* (2013) 95:351–65. doi: 10.1080/00223891.2013.770399

35. Viglione DJ, Hilsenroth MJ. The Rorschach: Facts, fictions, and future. *Psychological Assess.* (2001) 13:452. doi: 10.1037/1040-3590.13.4.452
36. Beck AT, Epstein N, Brown G, Steer RA. An inventory for measuring clinical anxiety: Psychometric properties. *J Consult Clin Psychol.* (1988) 56:893–7. doi: 10.1037/0022-006X.56.6.893
37. Song IH, Kwon SW, Kim JE. Association between suicidal ideation and exposure to suicide in social relationships among family, friend, and acquaintance survivors in South Korea. *Suicide Life-Threatening Behav.* (2015) 45:376–90. doi: 10.1111/sltb.12158
38. Singer T, Frith C. The painful side of empathy. *Nat Neurosci.* (2005) 8:845–6.
39. Staub E, Vollhardt J. Altruism born of suffering: The roots of caring and helping after victimization and other trauma. *Am J Orthopsychiatry* (2008) 78:267. doi: 10.1037/a0014223
40. Scocco P, Frasson A, Costacurta A, Pavan L. SOPRoX: a research-intervention project for suicide survivors. *Crisis* (2006) 27:39–41. doi: 10.1027/0227-5910.27.1.39
41. Scocco P, Toffol E, Totaro S, Castriotta C, Ferrari A. Postvention Initiatives in Italy. In: Andriessen K, Kryszka K, Grad O, editors. *Postvention in Action*. Boston, MA: Hogrefe (2017). p. 341–6.
42. Exner JE Jr. Problems with brief Rorschach protocols. *J Personality Assess.* (1988) 52:640–7. doi: 10.1207/s15327752jpa5204_4
43. Rorschach H. *Psychodagnostik* (Hans Huber Verlag, Trans). Bern: Bircher (1942). (Original work published in 1921).
44. Exner JE Jr. *The Rorschach: A Comprehensive System*. Vol. 1:1st ed. New York, NY: Wiley (1974).
45. Exner JE Jr. *A Rorschach Workbook for the Comprehensive System*, 4th ed. Ashville, NC: Rorschach Workshops (1995).
46. Mihura JL, Meyer GJ, Dumitrascu N, Bombel G. The validity of individual rorschach variables: systematic reviews and meta-analyses of the comprehensive system. *Psychol Bull.* (2013) 139:548. doi: 10.1037/a0029406
47. Perry W, Viglione DJ. The Ego Impairment Index as a Predictor of Outcome in Melancholic Depressed Patients Treated with Tricyclic Antidepressants. *Journal of Personality Assessment* (1991) 56:487–501. doi: 10.1207/s15327752jpa5603_10
48. Peters GJ, Kok G, Crutzen R, Sanderman R. Health Psychology Bulletin: improving publication practices to accelerate scientific progress. *Health Psychol Bull.* (2017) 1:1–6. doi: 10.5334/hpb.2
49. Cohen J. *Statistical power analysis for the behavioral sciences*. New York, NY: Routledge Academic (1988).
50. Sawilowsky SS. New effect size rules of thumb. *J Modern Appl Stat Methods* (2009) 8:26. doi: 10.22237/jmasm/1257035100
51. Paykel ES, Myers JK, Lindenthal JJ, Tanner J. Suicidal feelings in the general population: a prevalence study. *Br J Psychiatry* (1974) 124:460–9. doi: 10.1192/bjp.124.5.460
52. Scocco P, De Leo D. One-year prevalence of death thoughts, suicide ideation and behaviours in an elderly population. *Int J Geriatric Psychiatry* (2002) 17:842–6. doi: 10.1002/gps.691
53. Meyer GJ, Viglione DJ. An introduction to Rorschach assessment. In: Archer R. P, and Smith S. R. editors, *Personality Assessment*. New York, NY: Routledge (2008). p. 281–336.
54. Mannarini S, Boffo M. An implicit measure of associations with mental illness versus physical illness: response latency decomposition and stimuli differential functioning in relation to IAT order of associative conditions and accuracy. *PLoS ONE* (2014) 9:e101911. doi: 10.1371/journal.pone.0101911
55. Mannarini S, Balottin L, Toldo I, Gatta M. Alexithymia and psychosocial problems among Italian preadolescents. A latent class analysis approach. *Scand J Psychol.* (2016) 57:473–81. doi: 10.1111/sjop.12300
56. Gatta M, Balottin L, Mannarini S, Chesani G, Del Col L, Spoto A, et al. Familial factors relating to alexithymic traits in adolescents with psychiatric disorders. *Clin Psychol.* (2017) 21:252–62. doi: 10.1111/cp.12098
57. Mannarini S. A method for the definition of a self-awareness behavior dimension with clinical subjects: a latent trait analysis. *Behav Res Methods* (2009) 41:1029–37. doi: 10.3758/BRM.41.4.1029
58. Freud S. Mourning and melancholia. *Standard Edition* (1917) 14:243–258.
59. Manzano J, Espasa FP, Zilkha N, Espasa FP. *Les Scénarios Narcissiques de la Parentalité: Clinique de la Consultation Thérapeutique*. Paris: Presses Universitaires de France (1999).
60. Fenichel O. *The Psychoanalytic Theory of Neurosis*. New York, NY: Norton (1945).
61. Kaslow NJ, Reviere SL, Chance SE, Rogers JH, Hatcher CA, Wasserman F, et al. An empirical study of the psychodynamics of suicide. *J Am Psychoanal Assoc.* (1998) 46:777–96. doi: 10.1177/00030651980460030701
62. Asch SS. Suicide and the hidden executioner. *Int Rev Psycho-Anal.* (1980) 7:51–60.
63. Exner JE Jr. A new nonpatient sample for the rorschach comprehensive system: a progress report. *J Personality Assess.* (2002) 78:391–404. doi: 10.1207/S15327752JPA7803_01
64. Kayser-Boyd N, Evans B. Rorschach assessment of psychological trauma. In: Gacono CB, Evans FB, editors. *The Handbook of Forensic Rorschach Assessment*. New York, NY: Routledge/Taylor and Francis Group (2008). p. 255–78.
65. Armstrong JG, Loewenstein RJ. Characteristics of patients with multiple personality and dissociative disorders on psychological testing. *J Nervous Mental Dis.* (1990) 178:448–54. doi: 10.1097/00005053-199007000-00006
66. Opaas M, Hartmann E. Rorschach assessment of traumatized refugees: An exploratory factor analysis. *J Personality Assess.* (2013) 95:457–70. doi: 10.1080/00223891.2013.781030
67. Błaszczyk-Schiep S, Kazén M, Kuhl J, Grygielski M. Appraisal of suicidal risk among adolescents and young adults through the Rorschach test. *J Personality Assess.* (2011) 93:518–26. doi: 10.1080/00223891.2011.594130
68. Ephraim D. Rorschach trauma assessment of survivors of torture and state violence. *Rorschachiana* (2002) 25:58–76. doi: 10.1027/1192-5604.25.1.58
69. Varvin S, Rosenbaum B. Extreme traumatization: strategies for mental survival. *Int Forum Psychoanal.* (2003) 12:5–16. doi: 10.1080/083037060310005223
70. Weiner IB. *The LEA Series in Personality and Clinical Psychology. Principles of Rorschach Interpretation*. 2nd ed. Mahwah, NJ: Lawrence Erlbaum Associates Publishers (2003).
71. Cerel J, Padgett JH, Reed GA. Support groups for suicide survivors: results of a survey of group leaders. *Suicide and Life-Threatening Behav.* (2009) 39:588–98. doi: 10.1521/suli.2009.39.6.588
72. Testoni I, Francescon E, De Leo D, Santini A, Zamperini A. Forgiveness and blame among suicide survivors: a qualitative analysis on reports of 4-year self-help-group meetings. *Community Mental Health J.* (2018). doi: 10.1007/s10597-018-0291-3. [Epub ahead of print].
73. Scocco P, Zerbini L, Preti A, Ferrari A, Totaro S. Mindfulness-based weekend retreats for people bereaved by suicide (Panta Rhei): a pilot feasibility study. *Psychol Psychother.* (2018). doi: 10.1111/papt.12175. [Epub ahead of print].
74. Jordan JR, McMenamy J. Interventions for suicide survivors: a review of the literature. *Suicide and Life-Threatening Behav.* (2004) 34:337–49. doi: 10.1521/suli.34.4.337.53742

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Palmieri, Kleinbub, Mannarini, Molinaro, Castriotta and Scocco. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



The Influences of Drug Abuse on Mother-Infant Interaction Through the Lens of the Biopsychosocial Model of Health and Illness: A Review

Ilaria Cataldo^{1,2†}, Atiqah Azhari^{3†}, Aurora Coppola^{4,5}, Marc H. Bornstein^{6,7} and Gianluca Esposito^{1,3*}

OPEN ACCESS

Edited by:

Silvia Salcuni,
University of Padova, Italy

Reviewed by:

Osman Sabuncuoglu,
Marmara University School of
Medicine, Turkey
Sheffali Gulati,
All India Institute of Medical Sciences,
India

*Correspondence:

Gianluca Esposito
gianluca.esposito@ntu.edu.sg;
gianluca.esposito@unitn.it

[†]These authors have contributed
equally to this work

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 17 September 2018

Accepted: 15 February 2019

Published: 12 March 2019

Citation:

Cataldo I, Azhari A, Coppola A,
Bornstein MH and Esposito G (2019)
The Influences of Drug Abuse on
Mother-Infant Interaction Through the
Lens of the Biopsychosocial Model of
Health and Illness: A Review.
Front. Public Health 7:45.
doi: 10.3389/fpubh.2019.00045

¹ Affiliative Behavior and Physiology Lab, Department of Psychology and Cognitive Science, University of Trento, Rovereto, Italy, ² Mobile and Social Computing Lab, Bruno Kessler Foundation, Trento, Italy, ³ Social and Affective Neuroscience Lab, School of Social Sciences, Nanyang Technological University, Singapore, Singapore, ⁴ Psychology Unit, Azienda Provinciale per i Servizi Sanitari, Trento, Italy, ⁵ Service for Addiction-Ser.D, Azienda Provinciale per i Servizi Sanitari, Trento, Italy, ⁶ Child and Family Research, Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, MD, United States, ⁷ Institute for Fiscal Studies, London, United Kingdom

Women who abuse illicit drugs often engage in atypical parenting behaviors that interfere with the natural development of mother-infant interaction and attachment. Maternal caregiving deficits leave pronounced adverse consequences in the wake of drug abuse relapse, which often occurs and in early infancy. These are times when the child requires optimal parental care. The contemporary literature documents long-term implications of illicit drug-abuse in parenting on infants. However, factors that drive and sustain the influence of drug abuse on parent-infant outcomes remain elusive. This review adopts a biopsychosocial approach to synthesizing the existing state of knowledge on this issue. Mother-infant interaction is a dynamic socio-relational process that occurs at multiple levels of organization. As such, a biopsychosocial perspective enables us to uncover: (i) roles of specific physiological mechanisms and biological characteristics of atypical parenting in mothers who abuse drugs, (ii) the influence of drugs on maternal psychological state (i.e., beliefs regarding parenting practices, emotional regulation), and (iii) social relationships (i.e., relationships with spouse and other drug abusers) and contextual cues (i.e., triggers) that moderate non-optimal maternal caregiving. A comprehensive review of these key domains provides a nuanced understanding of how these several sources interdependently shape atypical parent-infant interaction amongst drug abusing mothers. Systematic elucidation of major factors underlying drug-abused maternal behaviors facilitates the development of targeted and more effective interventions.

Keywords: substance use disorder, mothering, parenting, mothers, drug abuse, mother-infant, mother-infant interaction

1. INTRODUCTION

Substance Use Disorder (SUD) is characterized by impairment in inhibitory control and social behaviors, risk taking, and hazardous pharmacological profiles, as defined in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorder. SUD reflects the abuse of various illicit psychoactive drugs, such as cannabis, hallucinogens, opioids, stimulants (including cocaine), sedatives, and hypnotics (1). According to 2015 Statistics of the World Drug Report, a disturbing global trend of drug consumption has emerged showing that 247 million people abuse drugs; among them, 29 million have been diagnosed with drug use disorder, but only 1 in 6 actually started a rehabilitation programme (2). Data published on the National Institute on Drug Abuse (NIDA) (3) states that men are more likely to use illicit drugs compared to women, but women tend to present more severe clinical outcomes with regard to social, psychological, medical, and behavioral drug-related impairments (4). The difference in effects exerted by psychotropic substances between the sexes pivots on the differential influence of neuroactive steroid hormones for neurobehavioral outcomes (5). One notable sex distinction in the modulation of neural substrates is the potent influence of female hormones, estradiol and progesterone, on the striatal dopamine reward and attentional system (6). Hormonal involvement and modulation can partially explain dissimilarities between men and women in neural circuits of stress adaptation and reward, which drive drug-seeking behaviors (7).

When addressing issues of women and drug abuse, it is mandatory to consider pregnancy and parenting, and how they are affected by illicit substance consumption. Analyzing the different components of parenting in drug-abusing mothers from a biopsychosocial perspective can advance our understanding of the dynamics intervening between the individual and the context that drive behavioral change (8), and provide basis for understanding the determinants of disease and arriving at rational treatments and patterns of health care (9). The relation between the singular person and her multiple concurrent contexts is even more relevant in the postpartum period, which represents a critical phase for mothers. Numerous biological and environmental changes occur at this time, and this period represents the beginning of a temporal window during which parents and infants lay the foundation of attachment that endure and shape the individual's life-long socio-emotional competencies and stress regulatory capacities (10).

The aim of the current review is to summarize the state of the art about illicit drug-abuse on maternal practices and to uncover biological and physiological features of atypical mothering, the impact of illicit drug consumption on maternal psychological characteristics, and the influence of social relationships on the modulation of maternal behaviors.

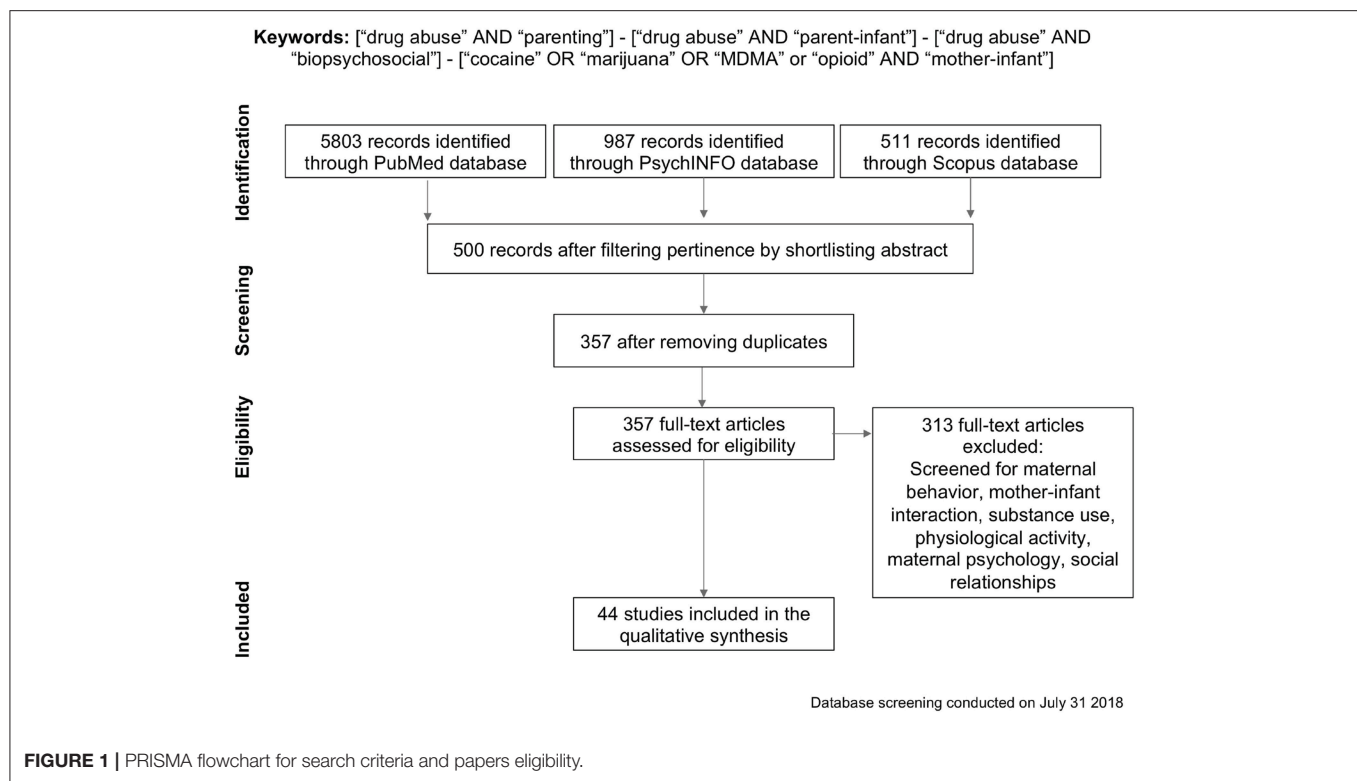
1.1. Biopsychosocial Model of Drug Abuse and Parenting

SUD is characterized by a set of psychological and behavioral features which likely result from the development of tolerance, psychological and physiological dependence, and addiction. The persistence of addiction is due to mechanisms of

reinforcement that can be both positive and negative. For example, positive reinforcement is the reward response that follows first consumption; a pleasurable experience with the drug leads to increased likelihood of further consumption. Conversely, the protracted use of the substance to avoid or soothe aversive withdrawal symptoms is considered a negative reinforcement that prolongs drug-intake behaviors and makes extinction more difficult (11). At a neurobiological level, reinforcement and relaps are modulated by both reward circuits and the stress response system (12). It is noteworthy that neurobiological changes occur in mothers' brains during the first few months after birth, mainly in brain regions designated to regulatory circuits, emotional responses, reward processing, executive functions, and parental behaviors (10). Processes implicated in drug addiction and mothering overlap at the neurobiological and psychological levels. Merging these considerations in the context of drug-abusing mothers renders it necessary to examine overall parent-infant interaction from a relational systems perspective that includes physiological and psychological needs of the mother, within a bioecological framework, so as to explicate the significance of autonomic mechanisms (13). Applying a physio-bioecological approach to the specific case of parenting in mothers with substance use disorders, the main aims are to uncover the effects that illicit drugs exert on maternal practices and parental styles in the domain of early mother-infant interaction, and to identify differences in maternal responses to infant stimuli between clinical and non-clinical populations.

2. METHODS AND RESULTS

We searched PubMed Central, PsycINFO and Scopus databases for articles on illicit drug abuse and parenting. We comparatively analyzed the entire literature from 1981 up to July 2018, combining different keywords and Boolean operators (see **Figure 1** PRISMA flowchart). This database was generated by combining terms and Boolean operators, such as "drug abuse" AND "parenting," "drug abuse" AND "parent-infant," "drug abuse" AND "biopsychosocial." To include more precise and targeted results, we conducted an additional search on the same databases using words describing the specific drugs we included in this review: "cocaine" OR "marijuana" OR "MDMA" or "opioid" AND "mother-infant." Overall, 7301 papers were identified by merging the PubMed Central, PsycINFO and Scopus databases, including only peer-reviewed published journal articles. Articles were shortlisted according to their relevance, and duplicates were removed, resulting in 357 records which were subsequently checked for eligibility. Records about treatment programs, comorbidity with psychiatric disorders, fatherhood, ethical concerns, alcohol or nicotine, national policy, HIV, body mass index, adolescents or toddlers older than 3 years, work related issues, and service caregivers' perceptions of parenting practices were removed, as were articles which were not human studies, on drug abuse, or not focusing on mother-infant interaction. This screening restricted the database to 44 records for the qualitative analysis. Afterwards, these studies were labeled with the substance discussed and filtered depending on one of three major topics of interest: physiological and biological characteristics of atypical mothering, influence of



drugs on maternal psychological state, and impact on mothers' social relationships (see **Supplementary Table 1** for the list of papers included in the review).

2.1. Level 1-Physiological Mechanisms and Biological Characteristics of Atypical Parenting in Mothers Addicted to Drugs

Affiliative behaviors fall within the purview of the dopamine and oxytocin reward systems, which overlap with neural structures and pathways related to drug abuse and parental behavior. Hence, in mothers with issues pertaining to drug consumption, activation of one circuit may occur at the expense of the other. More concretely, the reward system could be involved in drug-seeking behaviors, with negative implications for mothering behaviors. Furthermore, brain areas related to perception and elaboration of infant cues, such as the prefrontal cortex, might be engaged in overcoming actions related to drug consumption, leading to subsequent higher levels of stress, thus affecting interactions with the infant (14).

In the case of cocaine-exposed mothers, neurohormonal pathways (especially those regulating oxytocin) can be altered, leading to decreased neurohormonal levels that affect neural responses to infant cues (15). Illicit substances impact motivation circuits implicated in parenting regulation (16) and maternal practices, such as infant feeding. In cocaine-abusing women, evidence points to a tendency for poor infant engagement (11) which deteriorates over the course of the first year of postnatal life (17); these effects are accompanied by shorter duration feeding sessions and diminished cognitive flexibility (18). Even

among those receiving treatment, women exposed to opioids bear infants with neonatal abstinence syndrome and are less keen to breastfeed (19). Breastfeeding, while under opioid-treatment or not, has both short- and long-term consequences on dyadic attachment (20). SUD alters neurotransmission in the nucleus accumbens (NAcc), the prefrontal cortex (PFC), and ventral tegmental area (VTA). Functions in these areas become disrupted, with changes occurring in systems that regulate neurotransmitter levels in the forebrain and midbrain, like the transmission of serotonin and dopamine in the NAcc, and dysregulation of the hypothalamic-pituitary-adrenal axis (HPA) (12). These pathways enhance substance use relapse and augment negative affect, especially in women (4). Oxytocin modulates addiction-related behaviors, such as acquisition, withdrawal, drug-seeking, and relapse (15). Oxytocin contributes to social affiliative parenting behaviors. Not only is it involved in regulating uterine contractions during labor and milk ejection in breastfeeding, it is also pertinent to mother-infant bond formation and parental practices, eventually shaping the infant's own oxytocin profile (21). Although dopamine and oxytocin are different neurotransmitters, their pathways appear to be interlaced and, to a certain extent, overlap; thus, disruption of these systems can impact a multiplicity of mechanisms and behaviors related to both parenting and substance use (22). Indeed, during the early stages of development, infants express their needs through cries and facial expressions, and maternal drug consumption can alter maternal perceptions of these signals (23). For instance, modifications in perception of infant cues may manifest through a delay in facial recognition ERP responses to cry (24), and a reduction in activation of dopamine- and

oxytocin-innervated brain regions while looking at their own baby's face (25, 26).

Drug addiction and motherhood are both accompanied by specific cerebral morphological and neurophysiological changes. Functional Magnetic Resonance Imaging (fMRI) studies on postpartum mothers' brains show an increase in gray matter volume in morphological structures, such as the hypothalamus, striatum, amygdala, thalamus, and insula, which are associated with the reward circuit, motivation, sensory information processing, emotional regulation, and empathy (26, 27). In an fMRI study, Landi and colleagues (14) compared neurophysiological activation patterns in response to infant stimuli between cocaine-exposed and non-exposed mothers. The clinical sample showed reduced neural activation in prefrontal areas, occipital lobes, and limbic structures (amygdala and parahippocampus) while looking at infant faces. The authors also reported decreased neural activation in the insula and auditory sensory areas while drug-abusing women were listening to infant cries (14). Prolonged diminished neural responses in these regions might compromise maternal behavior toward infants' needs and cues, with negative implications on mother-infant attachment (28).

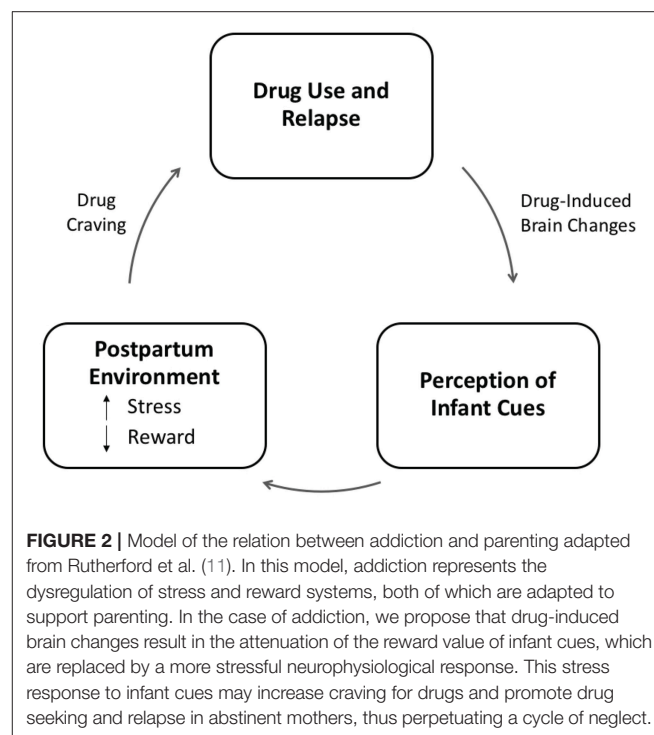
2.2. Level 2-Influence of Drugs on Maternal Psychological State

Motherhood comes with a series of neurobiological modifications, representing a vulnerable temporal window for the development of depressive symptoms and changes in psychological states. We have reported studies highlighting the involvement of the reward circuit and amygdala in mechanisms motivating maternal behaviors (26, 27). These two areas are functionally connected to prefrontal cortical regions during emotion regulation through the use of cognitive strategies, such as reappraisal (29). The same substrates are implicated in drug consumption pathways that impair executive function, a multidimensional construct that includes, besides emotion regulation, a suite of cognitive operations like mental flexibility, inhibition, planning, working memory, reflective functioning (30), verbal fluency (31), and language (22, 32).

Struggles with emotion regulation in substance-abusing mothers might reinforce drug usage as a strategy to deal with stress, instead of developing or enhancing more adaptive regulatory skills, thus further aggravating emotional dysregulation (32). Difficulties in emotional regulation make it more challenging for drug-abusing mothers to maintain correct perceptions of their child's affective needs. At the same time, altered mechanisms of the reward circuit have implications for maternal parenting practices: for instance, the reward system might be more responsive to substance abuse, leading to maladaptive mother-infant interaction characterized by emotional disengagement and less responsive behaviors (24, 33, 34), (14, 35). Furthermore (16), quality of parenting might vary in a dose-dependent manner according to the quantity of drug consumed (17, 36). As a consequence, the demands for care which stand at the core of the mother-infant relationship may turn into

a struggle, and fail to offer sufficient reward to addicted mothers, who are likely to adopt avoidant behaviors (11, 37) (see **Figure 2**).

Mother-infant attachment has become one of the most important concepts in developmental and clinical science since Bowlby published "Attachment and Loss" (38). Applying principles of attachment theory to the frame of substance-using mothers, individual characteristics of mother and infant alike define the nature of their interactions, so it is important to elucidate how specific drugs might alter mother-infant communication (39). Cocaine consumption during pregnancy compromises the quality of mother-infant interactions by altering maternal behaviors, such as warmth (40) and harshness (41), and infants of cocaine-abusing mothers are less responsive during play interactions (20, 24). Prenatally cocaine-exposed children undergo neurobehavioral changes, such as irritability, hypersensitivity, and difficulties in regulating emotional state that appear to prevent them from responding functionally to maternal stimuli; they may also appear lethargic, using sleepiness as a strategy to withdraw from stressful stimulation (42). Postnatal cocaine use has been reported to predict maternal insensitivity during interactions 8 weeks after birth (43). Overall, the quality of cocaine-mother and infant interaction is hallmarked by reduced mutual enjoyment, reciprocity, and regulation (33). However, some results in literature report that maternal cocaine use does not affect social interaction and attachment patterns at 12 (44) or 18 months (45). In general, an appropriate dyadic interaction requires high maternal sensitivity to infant cues. In this context, the concept of sensitivity implies the capacity to detect and accurately understand the child's signals



and to respond appropriately according to the child's needs. This skill requires reflective abilities, such as mentalization, which appears to be impaired in drug-abusing mothers with regard to meeting the baby's needs and their own parental competencies (31). Frequently, mothers with low mentalizing capabilities attributable to substance use misunderstand infant behaviors, interpreting them as rejecting, and hence construct a representation of their child as intrusive, detached, or hostile (31, 42). Abuse of drugs during motherhood may result in "blue moods," feelings of guilt, and inadequacy, which prevent the mother from being emotionally available in interactions with her offspring (42). Studies of drug-abusing mothers with more than one child have highlighted mothers' strain in delivering educational practices to older children, which point to difficulties in adjusting parenting behaviors that accord with developing requirements in their children (46).

2.3. Level 3-Social Relationships (i.e., Relationships With Spouse, Drug Abusers) and Contextual Cues (i.e., Triggers), in Modulating Maternal Misbehaviors

Drug abuse is related to the context of social relationships (especially when it develops into an addiction) due to its implications for users and for related people, such as families, other addicts, partners, and, of course, children (47). Substance-abusing mothers display more problematic behaviors during interactions and experience less social support and greater environmental difficulties, like domestic violence and other forms of abuse (48, 49). Socially rewarding experiences and relationships are protective factors against drug-seeking behaviors (50). Conversely, dysfunctional relationships can prompt drug abuse or relapse, especially during the perinatal and postpartum periods. During this time frame, there is a higher probability that women will become victims of intimate partner violence (IPV) (51), which is defined as the experience of "physical violence, sexual violence, stalking and psychological aggression, including coercive acts, by a current or former intimate partner" (52). When occurring during pregnancy, IPV has been correlated with adverse gestational events, such as preterm delivery and low weight at birth (53). Together with pregnancy intentions (e.g., unintended), IPV during the postpartum period is associated with increased use of substances in women as a mechanism to cope with stress (54, 55). Mothers who experience IPV often show hyper-controlling, overly permissive, or unresponsive maternal behaviors, along with poor emotional sustenance, leading to negative child developmental outcomes (51, 56). Mogro and colleagues reported that, contextually, a scarce social network can increase the risk of exposure and perpetration of IPV (57). Excepting some interventions, there is a notable gap in the literature about social support provided to drug-abusing mothers based on their social network; such support could represent a source of positive emotional help. Women with substance use issues have been reported to belong to limited social networks, providing them inadequate social support (58). Other contextual circumstances likely affect maternal behavior, such as the risk of losing custody

of the child, which is twice as likely in substance-using compared to non-using mothers (59).

3. PRENATAL EXPOSURE TO DRUGS AND COMPLICATIONS IN POSTNATAL PERIOD

Although not a main focus of the present review, it is important to note the effects of prenatal exposure to illicit drugs during pregnancy and in the postnatal period. As fetal development proceeds very rapidly and being greatly influenced by intrauterine environment and maternal behavior, maternal SUD may disrupt formation of several systems. Drugs might interrupt normal presynaptic reuptake of neurotransmitters (i.e., dopamine, serotonin), causing greater concentrations in the extracellular environment and risk of abnormal brain development (60).

Such consequences are generally associated with a set of medical conditions, including physical development, such as alterations of normal fetal growth, length and weight (61, 62) and morphometric cerebral features (63), but specific outcomes on perinatal and postpartum phases differ according to the substance the fetus has been exposed to. With regards to methamphetamine exposure, newborns might show congenital abnormalities like cardiac alterations and withdrawal symptoms (64). Maternal cocaine use during pregnancy might lead to intrauterine growth retardation and medical outcomes at birth, such as seizures, vomit, and alterations in sleep and cry patterns (62). In opioid-dependent women, who are usually subjected to methadone-maintenance therapy during gestation, neonatal issues appear to be quite severe, with a very high percentage of infants born prematurely and experiencing neonatal abstinence syndrome (NAS) in the first two weeks (65).

These complications have a profound impact on the prenatal and perinatal periods and have consequences in the long term. As mentioned, *in utero* drug exposure affects fetal development also due to the alteration of molecular pathway and neurobiology, such as cortical thickness, however long-term neurobehavioral concerns have been observed in children of drug-abusing mothers, including deficits in cognitive performance and conduct related issues, like negative reactivity and altered arousal and emotional problems (63, 66). Despite great progress in research in the last decades, some results appear inconsistent because of different factors (i.e., type of substance, quantity and frequency of intake) and possible co-presence of confounding factors (64, 67). Thanks to the new methodological approaches, together with longitudinal studies and animal models, it will be possible to broaden and deepen the understanding of dose-related issues and develop specific protocols of biopsychosocial interventions to attenuate the impact of prenatal drug exposure on future risk.

4. MATERNAL DRUG ABUSE AND RISK FOR CHILD MALTREATMENT

Combining biological and psychological factors occurring in maternal substance use disorder discussed so far (of both mother

and infant) with a challenging environment, it is possible to have a wider perspective of the complex frame, wherein the mother-infant dyad generates its bond. Issues related to parenting abilities in drug-abusing women are a great concern under a psychosocial perspective, not only with regards to women's mental health, but also to child development. In the model proposed in this review, emotional regulation in drug-abusing mothers is impaired due to substance consumption, which might lead to craving and drug-seeking behaviors to ease stress derived from infant cues, thereby enhancing maladaptive parental practices, sometimes at the expense of the well-being and safety of the child (48). Much research supports the association between prenatal drug exposure and childhood outcomes, but still few studies focus on maternal substance and child maltreatment, highlighting the increased risk of abuse (68), especially when combined with parental depressive symptoms (69, 70). As there is no standardized protocol for data collection in this specific field, statistics account for estimates that mainly rely on self-report information coming from intervention programs for drug-abusing mothers, describing a sample that hardly represent the actual one and that are more oriented to child protection than rehabilitation from SUD; more data derive from child welfare services, that usually adopt observational protocols focused on parenting abilities [for a review, see (71)]. The percentage of parents with only substance-use related issues involved in child welfare services is relatively small (72). This highlights the needs for a deeper comprehension of each component and more intensive focus on biophysiological influences and consequences to provide more tailored interventions within the dyad.

5. DISCUSSION AND CONCLUSION

In this review, we focused on how parenting, which is already stressful, affects and is affected by Substance Use Disorder, which has a large incidence in the general population. When a fundamental human relationship, like mother-infant interaction, intersects with a complex construct, like substance abuse, it is essential to consider all facets of the issue within a multilevel approach, such as what we have employed here.

Although parenting and drug-abuse behaviors operate on common brain regions and neurohormonal circuits (11, 14), the manner in which they impact life can vary across women. Both parental and drug-abusing behaviors are dynamic in nature, shaped by interactions with external cues (infant needs or craving for substance) and changeable patterns of action. To better understand the behavioral outcomes of the overlap of motherhood and drug-related issues, it is crucial to analyze the elements of which they are composed within a biopsychosocial framework separately, so as to define effective features of these occurrences. In attempting to extend this knowledge, we have uncovered several gaps in the literature.

First, substance use is strictly connected with laws and norms, especially when considering the consumption of illicit drugs, such as cocaine, heroin, hallucinogens, and

methamphetamine. This law-related factor highlights a critical issue of research in illicit drug use, misuse, and abuse, revealing an important gap. In fact, data are mainly collected using self-report questionnaires or provided by mental and social services. This method of data collection often yields an unrealistic estimate of the problem, which likely appears underreported.

Second, studies in the existing literature present data from USA, South America, Africa, and Europe, leaving the issue poorly explored in Asian and Pacific countries. Although a few reports display some prevalence rates, these are mainly estimates (73).

Illicit drug use acts on specific brain structures, where each substance exerts distinctive effects, altering perceptions in ways that could compromise maternal parenting practices. Only a few studies have compared differences in mother-infant interactions among diverse drug choices (24, 46); they tend to show variation in maternal engagement and responsiveness during interactions. Only one study distinguished abusers on the basis of drug quantity consumption (17), highlighting a more severe impairment in heavy consumers. Outcomes in both maternal and infant engagement and responsiveness while interacting may also vary depending on the age of the mother and years of drug consumption prior to pregnancy.

As emotion and stress regulation are some main mechanisms involved in parenting, it is desirable to provide more evidence about physio-behavioral responses to infant stimuli, such as promptness to action or measures of hormonal levels, in drug-using and non-using mothers and across different substances, to further elucidate their respective effects on parenting. Our search resulted in only a few studies that assessed physiological responses, such as electrical brain activity (24), whereas most focused on functional brain activation patterns (14, 26).

Most research in this field aims to reduce early life adversities, intergenerational effects, and the perpetuation of the cycle of addiction and childhood neglect (27), but there is a great need for more evidence related to physiological consequences of substance abuse on mothering (e.g., promptness to action, stress perception) to overcome self-report information and achieve a more reliable picture of developmental outcomes. The availability of more reliable information would lead to the possibility of more customized clinical practice and intervention with pregnant drug abusing women and for the mother-child dyad.

AUTHOR CONTRIBUTIONS

IC, AA, AC, MB, and GE conceived and designed the paper. IC and AA reviewed the literature and wrote the paper. MB and GE commented and submitted the paper.

FUNDING

This research was supported by the Nanyang President's Graduate Scholarship as well as the Nanyang Assistant Professor Start-Up Grant, the Intramural Research Program of the NIH/NICHD, USA, and an International Research Fellowship in

collaboration with the Center for the Evaluation of Development Policies (EDePo) at the Institute for Fiscal Studies (IFS), London, UK, funded by the European Research Council (ERC) under the Horizon 2020 research and innovation programme (grant agreement No 695300-HKADeC-ERC-2015-AdG).

REFERENCES

1. American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. Washington, DC: American Psychiatric Publication (2013).
2. United Nations Office on Drugs and Crime. *World Drug Report*. (2016). Available online at: https://www.unodc.org/doc/wdr2016/WORLD_DRUG_REPORT_2016_web.pdf
3. National Institute of Drug Abuse. *Substance Use in Women*. (2018). Available online at: <https://www.drugabuse.gov/publications/research-reports/substance-use-in-women/sex-gender-differences-in-substance-use>
4. Greenfield SF, Back SE, Lawson K, Brady KT. Substance abuse in women. *Psychiatr Clin*. (2010) 33:339–55. doi: 10.1016/j.psc.2010.01.004
5. Newman JL, Mello NK. Neuroactive gonadal steroid hormones and drug addiction in women. In: Brady KT, Back SE, Greenfield SF editor. *Women and Addiction: A Comprehensive Textbook*. New York, NY: The Guilford Press (2009). pp. 35–64.
6. Bisagno V, Cadet JL. Stress, gender, and addiction: potential roles of CRE, oxytocin and arginine vasopressin. *Behav Pharmacol*. (2014) 25:445. doi: 10.1097/FBP.0000000000000049
7. Sinha R. How does stress increase risk of drug abuse and relapse? *Psychopharmacology*. (2001) 158:343–59. doi: 10.1007/s002130100917
8. Bornstein MH, Esposito G. Beyond cry and laugh: Toward a multilevel model of language production. *Behav Brain Sci*. (2014) 37:548–9. doi: 10.1017/S0140525X13003968
9. Engel GL. The need for a new medical model: a challenge for biomedicine. *Science*. (1977) 196:129–36. doi: 10.1126/science.847460
10. Kim P, Rigo P, Leckman JF, Mayes L, Cole P, Feldman R, et al. A prospective longitudinal study of perceived infant outcomes at 18–24 months: neural and psychological correlates of parental thoughts and actions assessed during the first month postpartum. *Front Psychol*. (2015) 6:1772. doi: 10.3389/fpsyg.2015.01772
11. Rutherford H, Williams S, Moy S, Mayes L, Johns J. Disruption of maternal parenting circuitry by addictive process: rewiring of reward and stress systems. *Front Psychiatry*. (2011) 2:37. doi: 10.3389/fpsyg.2011.00037
12. Koob GF, Simon EJ. The neurobiology of addiction: where we have been and where we are going. *J Drug Iss*. (2009) 39:115–32. doi: 10.1177/002204260903900110
13. Esposito G, Setoh P, Bornstein MH. Beyond practices and values: toward a physio-bioecological analysis of sleeping arrangements in early infancy. *Front Psychol*. (2015) 6:264. doi: 10.3389/fpsyg.2015.00264
14. Landi N, Montoya J, Kober H, Rutherford H, Mencl E, Worhunsky P, et al. Maternal neural responses to infant cries and faces: relationships with substance use. *Front Psychiatry*. (2011) 2:32. doi: 10.3389/fpsyg.2011.00032
15. Williams S, Johns J. Prenatal and gestational cocaine exposure: effects on the oxytocin system and social behavior with implications for addiction. *Pharmacol Biochem Behav*. (2014) 119:10–21. doi: 10.1016/j.pbb.2013.07.004
16. Swain JE, Lorberbaum JP, Kose S, Strathearn L. Brain basis of early parent–infant interactions: psychology, physiology, and *in vivo* functional neuroimaging studies. *J Child Psychol Psychiatry*. (2007) 48:262–87. doi: 10.1111/j.1469-7610.2007.01731.x
17. Minnes S, Singer LT, Arendt R, Satayathum S. Effects of prenatal cocaine/polydrug use on maternal–infant feeding interactions during the first year of life. *J Develop Behav Pediatr*. (2005) 26:194. doi: 10.1097/00004703-200506000-00005
18. LaGasse L, Messinger D, Lester B, Seifer R, Tronick E, Bauer C, et al. Prenatal drug exposure and maternal and infant feeding behaviour. *Arch Dis Childh Fetal Neonatal Edn*. (2003) 88:F391–9. doi: 10.1136/fn.88.5.F391
19. Wachman EM, Byun J, Philipp BL. Breastfeeding rates among mothers of infants with neonatal abstinence syndrome. *Breastfeed Med*. (2010) 5:159–64. doi: 10.1089/bfm.2009.0079
20. Eiden RD, Schuetz P, Coles CD. Maternal cocaine use and mother–infant interactions: direct and moderated associations. *Neurotoxicol Teratol*. (2011) 33:120–8. doi: 10.1016/j.ntt.2010.08.005
21. Cataldo I, Azhari A, Lepri B, Esposito G. Oxytocin receptors (OXTR) and early parental care: an interaction that modulates psychiatric disorders. *Res Develop Disabil*. (2017) 82, 27–38. doi: 10.1016/j.ridd.2017.10.007
22. Strathearn L ML. Cocaine addiction in mothers: potential effects on maternal care and infant development. *Ann NY Acad Sci*. (2010) 1187:172–83. doi: 10.1111/j.1749-6632.2009.05142.x
23. Moses-Kolko E, Horner M, Phillips M, Hipwell A, Swain J. In search of neural endophenotypes of postpartum psychopathology and disrupted maternal caregiving. *J Neuroendocrinol*. (2014) 26:665–84. doi: 10.1111/jne.12183
24. Mayes LC, Feldman R, Granger RH, Haynes OM, Bornstein MH, Schottenfeld R. The effects of polydrug use with and without cocaine on mother–infant interaction at 3 and 6 months. *Infant Behav Develop*. (1997) 20:489–502. doi: 10.1016/S0163-6383(97)90038-2
25. Rigo P, Kim P, Esposito G, Putnick DL, Venuti P, Bornstein MH. Specific maternal brain responses to their own child's face: an fMRI meta-analysis. *Develop Rev*. (2019) 51:58–69. doi: 10.1016/j.dr.2018.12.001
26. Kim S, Iyengar U, Mayes LC, Potenza MN, Rutherford HJ, Strathearn L. Mothers with substance addictions show reduced reward responses when viewing their own infant's face. *Hum Brain Mapp*. (2017) 38:5421–39. doi: 10.1002/hbm.23731
27. Kim P, Strathearn L, Swain JE. The maternal brain and its plasticity in humans. *Hormon Behav*. (2016) 77:113–23. doi: 10.1016/j.yhbeh.2015.08.001
28. Pialiini G, De Palo F, Simonelli A. Parental brain: cerebral areas activated by infant cries and faces. a comparison between different populations of parents and not. *Front Psychol*. (2015) 6:1625. doi: 10.3389/fpsyg.2015.01625
29. Banks SJ, Eddy KT, Angstadt M, Nathan PJ, Phan KL. Amygdala–frontal connectivity during emotion regulation. *Soc Cogn Affect Neurosci*. (2007) 2:303–12. doi: 10.1093/scan/nsm029
30. Pajulo M, Pyykkönen N, Kalland M, Sinkkonen J, Helenius H, Punamäki RL, et al. Substance-abusing mothers in residential treatment with their babies: importance of pre- and postnatal maternal reflective functioning. *Infant Mental Health J*. (2012) 33:70–81. doi: 10.1002/imhj.20342
31. Håkansson U, Halsä A, Söderström K, Skärderud F, Øie MG. Keeping mind in mind: Mentalizing and executive functioning in substance-abusing infant mothers: Effect on dyadic relationship and infant outcome. *Subst Abuse Res Treat*. (2015) 9:SART–S23502. doi: 10.4137/SART.S23502
32. Borelli JL, West JL, Decoste C, Suchman NE. Emotionally avoidant language in the parenting interviews of substance-dependent mothers: associations with reflective functioning, recent substance use, and parenting behavior. *Infant Mental Health J*. (2012) 33:506–19. doi: 10.1002/imhj.21340
33. Burns K, Chethik L, Burns WJ, Clark R. Dyadic disturbances in cocaine-abusing mothers and their infants. *J Clin Psychol*. (1991) 47:316–9. doi: 10.1002/1097-4679(199103)47:2<316::AID-JCLP2270470220>3.0.CO;2-1
34. Gottwald SR, Thurman SK. The effects of prenatal cocaine exposure on mother–infant interaction and infant arousal in the newborn period. *Top Early Childh Spec Educ*. (1994) 14:217–31. doi: 10.1177/027112149401400206
35. Rasmussen HF, Borelli JL, Decoste C, Suchman NE. A longitudinal examination of toddlers' behavioral cues as a function of substance-abusing mothers' disengagement. *Infant Mental Health J*. (2016) 37:140–50. doi: 10.1002/imhj.21552
36. Tronick E, Messinger D, Weinberg M, Lester B, LaGasse L, Seifer R, et al. Cocaine exposure is associated with subtle compromises of infants' and mothers' social-emotional behavior and dyadic features of their interaction in the face-to-face still-face paradigm. *Develop Psychol*. (2005) 41:711. doi: 10.1037/0012-1649.41.5.711
37. Brancato A, Cannizzaro C. Mothering under the influence: how perinatal drugs of abuse alter the mother–infant interaction. *Rev Neurosci*. (2018) 29:283–94. doi: 10.1515/revneuro-2017-0052

SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fpubh.2019.00045/full#supplementary-material>

38. Bowlby J. *Attachment and Loss, vol. II: Separation*. Vol. 2. New York, NY: Basic Books (1973).
39. Parolin M, Simonelli A. Attachment theory and maternal drug addiction: the contribution to parenting interventions. *Front Psychiatry*. (2016) 7:152. doi: 10.3389/fpsy.2016.00152
40. Eiden RD, Granger DA, Schuetz P, Veira Y. Child behavior problems among cocaine-exposed toddlers: indirect and interactive effects. *Develop Psychopathol*. (2011) 23:539–50. doi: 10.1017/S0954579411000058
41. Eiden R, Schuetz P, Veira Y, Cox E, Jarrett T, Johns J. Cocaine exposure and children's self-regulation: indirect association via maternal harshness. *Front Psychiatry*. (2011) 2:31. doi: 10.3389/fpsy.2011.00031
42. Miller-Kuhaneck H. Prenatal cocaine exposure and mother–infant interaction: implications for occupational therapy intervention. *Am J Occup Ther*. (1997) 51:119–31. doi: 10.5014/ajot.51.2.119
43. Eiden RD, Stevens A, Schuetz P, Dombkowski LE. Conceptual model for maternal behavior among polydrug cocaine-using mothers: the role of postnatal cocaine use and maternal depression. *Psychol Addict Behav*. (2006) 20:1. doi: 10.1037/0893-164X.20.1.1
44. Ukeje I, Bendersky M, Lewis M. Mother–infant interaction at 12 months in prenatally cocaine-exposed children. *Am J Drug Alcohol Abuse*. (2001) 27:203–24. doi: 10.1081/ADA-100103706
45. Haltigan JD, Lambert BL, Seifer R, Ekas NV, Bauer CR, Messinger DS. Security of attachment and quality of mother–toddler social interaction in a high-risk sample. *Infant Behav Develop*. (2012) 35:83–93. doi: 10.1016/j.infbeh.2011.09.002
46. Slesnick N, Feng X, Brakenhoff B, Brigham GS. Parenting under the influence: the effects of opioids, alcohol and cocaine on mother–child interaction. *Addict Behav*. (2014) 39:897–900. doi: 10.1016/j.addbeh.2014.02.003
47. Griffiths MD, Larkin M. Editorial conceptualizing addiction: the case for a “complex systems” account. *Addict Res Theory*. (2004) 12:99–102. doi: 10.1080/1606635042000193211
48. Twomey J, LaGasse L, Derauf C, Newman E, Shah R, Smith L, et al. Prenatal methamphetamine exposure, home environment, and primary caregiver risk factors predict child behavioral problems at 5 years. *Am J Orthopsych*. (2013) 83:64. doi: 10.1111/ajop.12007
49. Pajulo M, Savonlahti E, Sourander A, Ahlqvist S, Helenius H, Piha J. An early report on the mother–baby interactive capacity of substance-abusing mothers. *J Subst Abuse Treat*. (2001) 20:143–51. doi: 10.1016/S0740-5472(00)00161-6
50. Beloate LN, Coolen LM. Influences of social reward experience on behavioral responses to drugs of abuse: review of shared and divergent neural plasticity mechanisms for sexual reward and drugs of abuse. *Neurosci Biobehav Rev*. (2017) 83:356–72. doi: 10.1016/j.neubiorev.2017.10.024
51. Quinlivan JA, Evans S. Impact of domestic violence and drug abuse in pregnancy on maternal attachment and infant temperament in teenage mothers in the setting of best clinical practice. *Arch Women Mental Health*. (2005) 8:191–9. doi: 10.1007/s00737-005-0079-7
52. Centers for Disease Control and Prevention. *Intimate Partner Violence: Definitions* (2010). Available online at: <http://www.cdc.gov/ViolencePrevention/intimatepartnerviolence/definitions.html>
53. Alhusen JL, Lucea MB, Bullock L, Sharps P. Intimate partner violence, substance use, and adverse neonatal outcomes among urban women. *J Pediatr*. (2013) 163:471–6. doi: 10.1016/j.jpeds.2013.01.036
54. Crane CA, Schlauch RC, Devine S, Easton CJ. Comorbid substance use diagnoses and partner violence among offenders receiving pharmacotherapy for opioid dependence. *J Addict Dis*. (2016) 35:205–11. doi: 10.1080/10550887.2016.1154400
55. Taillieu TL, Brownridge DA. Violence against pregnant women: prevalence, patterns, risk factors, theories, and directions for future research. *Aggress Viol Behav*. (2010) 15:14–35. doi: 10.1016/j.avb.2009.07.013
56. Pels T, van Rooij FB, Distelbrink M. The impact of intimate partner violence (IPV) on parenting by mothers within an ethnically diverse population in the Netherlands. *J Fam Viol*. (2015) 30:1055–67. doi: 10.1007/s10896-015-9746-2
57. Mogro-Wilson C, Negroni LK, Hesselbrock MN. Puerto Rican parenting and acculturation in families experiencing substance use and intimate partner violence. *J Soc Work Pract Addict*. (2013) 13:50–69. doi: 10.1080/1533256X.2012.756792
58. Tracy EM, Munson MR, Peterson LT, Floersch JE. Social support: a mixed blessing for women in substance abuse treatment. *J Soc Work Pract Addict*. (2010) 10:257–82. doi: 10.1080/1533256X.2010.500970
59. National Institute of Drug Abuse. *Blending Perspectives and Building Common Ground: A Report to Congress on Substance Abuse and Child Protection* (1999). Available online at: <https://aspe.hhs.gov/execsum/blending-perspectives-and-building-common-ground-report-congress-substance-abuse-and-child-protection>
60. Lin B, Ostlund BD, Conradt E, Lagasse LL, Lester BM. Testing the programming of temperament and psychopathology in two independent samples of children with prenatal substance exposure. *Develop Psychopathol*. (2018) 30:1023–40. doi: 10.1017/S0954579418000391
61. Jacobson JL, Jacobson SW, Sokol RJ. Effects of prenatal exposure to alcohol, smoking, and illicit drugs on postpartum somatic growth. *Alcoholism*. (1994) 18:317–23. doi: 10.1111/j.1530-0277.1994.tb00020.x
62. Black M, Schuler M, Nair P. Prenatal drug exposure: neurodevelopmental outcome and parenting environment. *J Pediatr Psychol*. (1993) 18:605–20. doi: 10.1093/jpepsy/18.5.605
63. Walhovd KB, Moe V, Slinning K, Due-Tønnessen P, Bjørnerud A, Dale AM, et al. Volumetric cerebral characteristics of children exposed to opiates and other substances in utero. *Neuroimage*. (2007) 36:1331–44. doi: 10.1016/j.neuroimage.2007.03.070
64. Ross EJ, Graham DL, Money KM, Stanwood GD. Developmental consequences of fetal exposure to drugs: what we know and what we still must learn. *Neuropsychopharmacology*. (2015) 40:61. doi: 10.1038/npp.2014.147
65. De Castro A, Jones HE, Johnson RE, Gray TR, Shakleya DM, Huestis MA. Methadone, cocaine, opiates and metabolite disposition in umbilical cord and correlations to maternal methadone dose and neonatal outcomes. *Therapeut Drug Monit*. (2011) 33:443. doi: 10.1097/FTD.0b013e31822724f0
66. Behnke M, Smith VC, Committee on Substance Abuse; Committee on Fetus and Newborn. Prenatal substance abuse: short- and long-term effects on the exposed fetus. *Pediatrics*. (2013) 131:e1009–24. doi: 10.1542/peds.2012-3931
67. Minnes S, Lang A, Singer L. Prenatal tobacco, marijuana, stimulant, and opiate exposure: outcomes and practice implications. *Addict Sci Clin Pract*. (2011) 6:57.
68. Leventhal JM, Forsyth BW, Qi K, Johnson L, Schroeder D, Votto N, et al. Maltreatment of children born to women who used cocaine during pregnancy: a population-based study. *Pediatrics*. (1997) 100:e7. doi: 10.1542/peds.100.2.e7
69. Kelley ML, Lawrence HR, Millettich RJ, Hollis BF, Henson JM. Modeling risk for child abuse and harsh parenting in families with depressed and substance-abusing parents. *Child Abuse Neglect*. (2015) 43:42–52. doi: 10.1016/j.chiabu.2015.01.017
70. Dubowitz H, Kim J, Black MM, Weisbart C, Semiatin J, Magder LS. Identifying children at high risk for a child maltreatment report. *Child Abuse Neglect*. (2011) 35:96–104. doi: 10.1016/j.chiabu.2010.09.003
71. Marsh JC, Smith BD, Bruni M. Integrated substance abuse and child welfare services for women: a progress review. *Child Youth Serv Rev*. (2011) 33:466–72. doi: 10.1016/j.childyouth.2010.06.017
72. Marsh JC, Ryan JB, Choi S, Testa MF. Integrated services for families with multiple problems: obstacles to family reunification. *Child Youth Serv Rev*. (2006) 28:1074–87. doi: 10.1016/j.childyouth.2005.10.012
73. Devaney ML, Devaney ML, Reid G, Devaney ML, Reid G, Baldwin S, et al. Prevalence of illicit drug use in Asia and the Pacific. *Drug Alcohol Rev*. (2007) 26:97–102. doi: 10.1080/09595230601037034

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Cataldo, Azhari, Coppola, Bornstein and Esposito. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



The Focal Play Therapy: A Clinical Approach to Promote Child Health and Family Well-being

Ilaria Chirico*, Federica Andrei, Paola Salvatori, Irene Malaguti and Elena Trombini

Department of Psychology, University of Bologna, Bologna, Italy

OPEN ACCESS

Edited by:

Silvia Salcuni,
University of Padova, Italy

Reviewed by:

Birsen Altay,
Ondokuz Mayıs University, Turkey
Marina Miscioscia,
University of Padova, Italy

*Correspondence:

Ilaria Chirico
ilaria.chirico2@unibo.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 13 September 2018

Accepted: 18 March 2019

Published: 05 April 2019

Citation:

Chirico I, Andrei F, Salvatori P,
Malaguti I and Trombini E (2019) The
Focal Play Therapy: A Clinical
Approach to Promote Child Health
and Family Well-being.
Front. Public Health 7:77.
doi: 10.3389/fpubh.2019.00077

Eating and evacuation disorders can cause serious health problems for children. Early recognition and early treatment require a multifactor intervention based on a collaborative relationship between pediatricians, psychotherapists and other health professionals. In this context the Focal Play Therapy (FPT) with children and parents is a psychodynamic model of intervention that improves parental ability to cope with child's difficulties. Parental engagement in child interventions allows to understand child's symptoms within family dynamics and to build an alliance with parents that represents a crucial variable of an effective psychological support for children and families. In the present study data were collected from 17 parental couples and their preschool children at two time points (1st and 6th FPT sessions) marking the first phase of this intervention. This phase was aimed to the assessment of child's symptoms within family relationships and to the promotion of the alliance with parents. Families were in treatment at the Psychological Consultation Center for Children and Parents located at the Department of Psychology of the University of Bologna (Italy). This Center provides health assessment and intervention services to children and their families. We investigated the alliance from both parents and therapist points of view along with other parental and child outcome variables implied in clinical works with children and families. Alliance scores were obtained through the Working Alliance Inventory and the System for Observing Family Therapy Alliances, two measures used in individual and family settings, respectively. Parenting stress and parent-child interactions were investigated using the Parenting Stress Index and the Emotional Availability Scales. Furthermore, paired *t*-tests were run to detect changes on parental and child variables. Findings advise that special attention should be paid to the building of an early alliance with parents. In this regard the FPT is specifically designed to promote the parent-therapist alliance in the context of child health and family well-being.

Keywords: child eating disorders, child evacuation disorders, parent-child interventions, therapeutic alliance, focal-play therapy

INTRODUCTION

The "Focal Play Therapy with children and parents" is a psychodynamic model of intervention specifically designed for child's eating and evacuation disorders in which parents are actively involved in play and a special emphasis is given to the early building of the parent-therapist alliance. Effective interventions for children are needed since eating and evacuation disorders currently

represent one of the most frequent reasons of referral to pediatric and infant mental health clinics (1, 2). Common eating disturbances in children are: lower intakes of food than expected for their age, lack of appetite/food-searching behaviors, difficulty with fluids or with foodstuffs, and reluctance or refusal to eat (2, 3). Child eating maladaptive behaviors also include: child's regulation difficulties during feedings, eating only in fixed conditions, and/or being an extremely picky eater (4). Prevalence rates in Western countries range from 25 to 40% of infants referred for under-eating problems (3, 5).

Evacuation disorders consist of constipation, encopresis and soiling and they usually arise in the period of toilet training. Constipation is characterized by low frequency bowel movements leading to encopresis and/or soiling, unusually large amounts of stool, restrictive posturing, and frequently painful voiding (6–9). The world-wide prevalence of child constipation ranges from 0.7 to 29.6% (10), while encopresis has a reported prevalence of 1.5–9.8% in children (11). Without early treatments eating and evacuation disorders tend to persist into adulthood with serious physical damage and medical problems (12, 13).

Child's eating and evacuation disorders put into question the quality of the parent–child relationship. Preschool children usually strive to establish a direct and autonomous relationship with food and corporal contents (14–18). If parents do not facilitate the child's acquisition of autonomy, parent–child relationship problems may occur and they are usually expressed through difficulties concerning eating and evacuation behaviors in children. In these clinical populations, parents who find it difficult to adapt themselves to the child's emerging needs can experience high levels of stress and of psychological impairment. They often have feelings of self-blame and worries about the child's future, isolation, and lack of pleasure activities thus compromising their ability to act constructively in child treatment (19–22).

Nowadays most child-focused interventions involve parents who are responsible for several aspects of the therapeutic process. In this context, clinicians have to build a relationship with parents based on a mutual understanding of the child's problems and on their collaboration/agreement about goals and tasks of child therapy (23–25). These aspects refer to the therapeutic alliance with parents that is a crucial component of a successful child assessment and intervention process (26, 27). A high parent–therapist alliance correlates with low drop-out rates, a decreased youth symptomatology, and improved parenting practices and family functioning (28–30).

Theoretical (problem type, child age, parent sex) and methodological (alliance and outcome reported by the same informant, source and timing of alliance, and outcome assessment) factors may influence the parent–therapist alliance and therapeutic outcome association. As reported by a recent review (31), this association was stronger when the alliance was measured later in treatment and studies evaluated treatment engagement instead of clinical outcomes. Moreover, as expected, weaker correlations were found when the alliance and outcome measures were reported by different informants. For what concerns the remaining factors (problem type, child age, parent sex, source of alliance measurement, timing of outcome

measurement), contradictory findings underline the need for future research to understand the specific conditions in which the parent–therapist alliance can predict clinical outcomes and treatment engagement.

Current studies on alliance mainly involve schoolchildren and, simultaneously, their parents attending separate therapy sessions. To our knowledge there is a paucity of data about the assessment of the parent–therapist alliance in the context of preschool psychological treatments involving young children and their families. This gap needs to be filled by new research on different types of child and family treatments.

The Focal Play Therapy

The “Focal Play Therapy with children and parents” [FPT-CP; (14, 16, 17, 32–34)] consists of weekly alternate play sessions with the child and his/her parents together, and sessions with parents only. As already mentioned, preschool children put effort in establishing a direct and autonomous relationship with food and corporal contents (14–18). When the child's motivation to “do by himself” is coherent with the feeling of being “I” but also part of the family/“We,” the child feels his needs as coherent with parental behaviors and expectations. Otherwise, when parents interfere with the child's acquisition of autonomy, children often express a psychosomatic protest aimed to gain or regain their lost autonomy.

The FPT-CP consists of the therapist's proposal to the child of a temporal sequence during which the main character is a plasticine puppet guided by the therapist. This puppet performs the human basic physiological functions (eating, evacuation, and sleeping) that play a crucial role in the preschool period. The therapist gives voice to the puppet and let it talk about and ask for foods that are prepared with the same materials (plasticine). The puppet seems to appreciate food and, after eating, it expresses the need to urinate and defecate in a potty or toilet bowl built with plasticine. Usually, this sequence is followed by exclamations of relief and comfort.

After this preparatory phase, the therapist allows the child to express through play his psychological contents, desires, fears and internal conflicts and to start managing autonomously the relationship with both food and corporal contents. The FPT-CP main objectives are: re-establishing the natural valence of food and corporal contents and allowing child's direct contact with them through the food selection and preparation, the decision of eating, followed by the need to evacuate and the desire to do it in an appropriate place for family.

During play sessions parents can show two opposite attitudes. On the one hand, they can follow child's creativity in play thus showing patience, collaboration, support and enthusiasm. On the other hand, as for child's eating and evacuation disorders, parents interfere with child's desire of autonomy through impositions, irrelevant or distracting interventions, lack of interest and self-exclusion. In these cases, the clinical work aims to help parents to change their intrusive behaviors toward the child into more adaptive ones. In this regard, clinical evidence has shown that the FPT-CP allows to re-evaluate parental abilities to cope with child's difficulties, to reduce parenting stress and to restore family harmony and well-being (17, 32, 34).

Specifically, the FPT-CP first phase (6 sessions) is aimed to understand the child's symptoms within family dynamics and to promote and maintain a strong parent-therapist alliance as strictly associated to child outcomes. Usually, at the end of this phase, once the therapist has established a positive relationship with the child and his/her parents, the therapist comes to an agreement with both of them about the opportunity to move forward with the therapeutic process in order to obtain a remission of child symptoms. Modalities can be slightly different according to each clinical situation and child/family needs although the FPT-CP structure tends to be the same (i.e., alternate play sessions with the child and his/her parents together and sessions with parents only).

The Present Study

As previously described, the FPT-CP was specifically designed for children's eating and evacuation disorders and a special emphasis is given to the early building of the parent-therapist alliance as a pre-condition for a successful intervention. To our knowledge, there are only very few data available on the assessment of the parent-therapist alliance in the context of preschool psychological treatments involving young children and their families. This gap needs to be filled by new research on different types of treatment to better inform practice and to improve quality of care for children and their families.

In light of the above-discussed issues, the present study aims to address the quality of the parent-therapist alliance during the first phase (i.e., from session one to session six) of the FPT-CP by means of a multi-method approach. Data were triangulated, namely, therapeutic alliance was investigated from both parents' and therapist's perspectives, and collected longitudinally. Furthermore, in order to assess for congruity, differences in alliance scores among mothers, fathers and therapists were investigated. The present study investigates also the effects of the first FPT-CP phase in terms of reducing parental levels of stress and improving the quality of adult-child relationships.

We hypothesized that: (1) a positive parent-therapist alliance would be developed and maintained throughout the first FPT-CP 6 sessions; (2) there would be a slight initial decrease in the parental levels of stress and a small increase in the quality of adult-child relationships. Regarding the second hypothesis, although triadic interactions represent a unique source of information as they integrate qualities of all family subsystems, they were not evaluated in the present study. This methodological choice was driven by specific theoretical issues concerning the FPT-CP. Indeed, it is a psychodynamic psychotherapy for the child and it does not represent a family therapy or a therapy for parents. Furthermore, because of the nature and severity of child symptoms, we did not hypothesize a high increase in the quality of adult-child relationships. Indeed, as documented in the literature (14, 16, 17, 32–34), in most clinical cases significant changes did not occur in 6 sessions and, therefore, more sessions were required.

MATERIALS AND METHODS

Participants

Families were recruited consecutively from November 2015 to June 2017 at the Psychological Consultation Center for Children and Parents located at the Department of Psychology of the University of Bologna (Italy). This Center provides health assessment and intervention services to children and their families. Parental access to the Center was voluntary.

Participants were 17 couples ($N = 34$; 17 mothers and 17 fathers) and their preschool children ($N = 17$; 13 boys and 4 girls) at their first access to the Center for their child's eating (e.g., food refusal and selective feeding) or evacuation (i.e., constipation and encopresis) problems. Exclusion criteria for the access to the treatment were: (a) child's organic diseases, (b) child's neurodevelopmental disorders, (c) parental past or present psychiatric disorders, (d) parent's lack of proficiency in the Italian language. No exclusion criterion was met by any of the families who took part in the study.

Families were seen by five women psychoanalytic psychotherapists with expertise in the use of the FPT-CP technique. The average patient caseload was approximately three families which were met each once a week.

Instruments

Demographics

An *ad-hoc* questionnaire was created to collect infant information and parental socio-demographic characteristics (e.g., age, nationality, marital status, occupation, and level of education).

Therapeutic Alliance

Therapeutic alliance was assessed by means of two measures: the Working Alliance Inventory-Short Form [WAI-SF; (35, 36)] and the System for Observing Family Therapy Alliances-Self report [SOFTA-S; (37, 38)]. The WAI-SF is one of the most used and validated measures of alliance in individual psychotherapy settings. It consists of 12 items and 3 scales: Goal (e.g., "The therapist and I are working toward mutually agreed upon goals"), Task (e.g., "The therapist and I agree about the things I will need to do in therapy to help improve my situation"), and Bond (e.g., "The therapist and I trust one another"). Each item is rated on a 7-point Likert scale (1 = never, 7 = always). The score range of each subscale goes from 4 to 28, whereas the global score ranges from 12 to 84; higher scores reflect more positive ratings of alliance. The reliability and validity of the WAI-SF have been supported in a wide range of studies (39). In the present research Cronbach's (40) alpha total score coefficient was from good ($=0.86$) to excellent ($=0.96$).

The System for Observing Family Therapy Alliances-Self Report [SOFTA-S; (37, 38)] has been specifically designed to measure the alliance in conjoint settings where the shared sense of purpose within family is essential for positive therapeutic outcomes. It consists of 4 scales: Engagement in the Therapeutic Process (e.g., "The therapist and I work together as a team"), Emotional Connection With the Therapist (e.g., "The therapist has become an important person in my life"), Safety Within the

Therapeutic System (e.g., “There are some topics I am afraid to discuss in therapy”), and Shared Sense of Purpose Within the Family (e.g., “Each of us in the family helps the others to get what they want out of therapy”). Clients respond to 16 items on a 5-point Likert scale (1 = not at all, 5 = very much). Each subscale ranges from 4 to 20, while the global score goes from 16 to 80. Higher ratings reflect more positive alliances. In line with previous literature (41, 42) in the present study alpha total score coefficient was from good ($=0.85$) to excellent ($=0.92$).

Parenting stress. The Parenting Stress Index-Short Form [PSI-SF; (43, 44)] was used to assess parenting stress. It consists of 3 scales: Parental Distress (e.g., “I feel trapped by my responsibilities as a parent”), Parent-Child Dysfunctional Interaction (e.g., “My child rarely does things for me that make me feel good”), and Difficult Child (e.g., “My child seems to cry or fuss more than most children”). Clients respond to 36 items on a 5-point Likert scale (1 = strongly disagree to 5 = strongly agree). Each subscale ranges from 12 to 60, while the global score goes from 36 to 180. In the present study percentile rank classes were used as well. According to the manual (44) scores between the 15th and 84th percentiles are within the normal range for stress; scores between the 85th and 89th percentiles represent a high level of stress and scores ≥ 90 th percentile indicate clinically significant or severe parenting stress. As for the present research, alpha total score coefficient was from acceptable ($=0.78$) to excellent ($=0.92$).

Parent-Child Interactions

Interactions between parents and their children were coded according to the 4th edition of the Infancy/Early Childhood Version of the Emotional Availability Scales [EAS; (45)]. The construct of emotional availability (EA) refers to the parent-child dyad's capacity of a genuine emotional connection (45, 46). The EAS consists of 4 adult scales (Sensitivity, Structuring, Non-Intrusiveness, and Non-Hostility) and 2 child dimensions (Responsiveness and Involvement). Each scale is composed of 7 items and provides a total score computed by summing up scores obtained at each item. Furthermore, a direct score is assigned for each dimension on a 1–7 points Likert scale. Direct scores were used in the present study as they are common for research purposes thus giving an immediate indication of the level of emotional availability displayed by the dyad (45, 46). Two blind raters who were previously trained to reliability in the use of the EAS coded all videos. The degree of agreement between the two coders was measured on a random selection of 30% of the videos. Intraclass correlation coefficient between the two coders was found to be good for research purposes and ranged between 0.68 and 0.85 (mean = 0.79). Following, the EAS dimensions are thoroughly described.

Adult Sensitivity

It evaluates the adult's appropriate and positive affective exchanges consisting of an adequate perception of emotions, responsiveness to the child's cues, ability to handle conflictual situations, and awareness of timing. High-end scores (6–7) represent optimal sensitivity, the mid-point ratings (4–5) refer

to inconsistent/apparent sensitivity, and the lowest scores (1–2–3) represent emotional detachment.

Adult Structuring

It refers to the parent's ability to guide the child during play. High-end scores indicate optimal structuring, the mid-point ratings indicate inconsistent structuring (mismatch between the adult and the child, i.e., there may be too much structuring in a way that the child cannot absorb it), and the lowest scores represent a lack of adult's structuring in the interactions.

Adult Non-intrusiveness

It investigates the absence of over-directions, overstimulation, interferences or over-protection in the adult's behavior. High-end scores indicate that the adult is a non-intrusive and a supportive presence, middle-range scores represent benign intrusiveness and over protectiveness, low-end ratings indicate adult intrusiveness, and physical intrusion.

Adult Non-hostility

It evaluates the absence of adult hostile behaviors (covert or overt) toward the child. Hostile behaviors include verbal or physical aggressiveness (overt), and the adult's subtle expressions of boredom, impatience, frustration (covert). High-end scores indicate a lack of any hostility in face, voice or bodily actions; middle range ratings indicate covert hostility; and lower scores indicate overt hostility.

Child's Responsiveness

It measures the quality of the child's affect and responsiveness to the adult. High-end scores refer to a child who is emotionally connected to the adult in an age-appropriate way. Middle range scores indicate a child who is connected but he/she tends to be over solicitous to the adult's directions with limits on child's autonomy. Low-end ratings indicate an either over-connected or under-connected child who may/or may not reflect a disorganized-traumatized affective relationship with the caregiver.

Child's Involvement

It refers to the child's capacity to engage the adult in the interaction. High-end scores indicate the child's ability and interest in taking the initiative in the interaction. Middle-point ratings reflect the child's way to engage the adult that is characterized by negative emotions, distress or crisis scenarios. Low-range scores indicate the child's passivity or lack of interest in the relationship with the adult.

Procedure

The research was approved by the Ethic Committee of the University of Bologna (Italy). Participation in the present study was based on the family's informed and signed consent. Informed consent included confidentiality and the client's right to withdraw at any time. Families were screened in terms of the previously mentioned exclusion criteria and they were assigned to therapists according to availability.

The present research focused on a specific phase of this intervention represented by the first 6 sessions aimed to the

assessment of child symptoms and to the promotion of the parent-therapist alliance. This therapeutic relationship consists of a mutual understanding of child difficulties and, also, of the parental collaboration and agreement on main goals and tasks of the intervention. In this sense the parent-therapist alliance is a prerequisite to treatment integrity. Below are the 7 FPT-CP sessions where data collection occurred:

- 1st session: with parents;
- 2nd session: with the child and his/her parents;
- 3rd session: with the child and his/her mother;
- 4th session: with parents;
- 5th session: with the child and his/her father;
- 6th session: with parents;
- 7th session: with the child and his/her parents.

During sessions with parents, the therapist focuses on child's difficulties, themes and family topics emerged in play sessions with the child. As explained above, the FPT-CP main purposes are: re-establishing the natural valence of food and corporal contents for children and allowing their direct contact with them (14, 16, 17, 32–34). During play sessions parents can show two opposite attitudes. In particular, positive parental behaviors are characterized by tolerance, patience, collaboration, support and proposals in line with child's creativity, along with a trust and enthusiasm in his play abilities. By contrast, as for child's eating and evacuation disorders, parental behaviors consist of impositions rather than proposals, irrelevant or distracting interventions, lack of interest and self-exclusion. These parental behaviors are thoroughly discussed during sessions with parents in order to allow a shift from parental intrusive and coercive behaviors toward the child into more adaptive ones.

As previously mentioned, the FPT-CP is a psychodynamic psychotherapy for children and it does not represent a family therapy or a therapy for parents. Indeed, in cases in which high marital conflicts had a negative impact on child-parent and co-parenting relationships, they were taken into account and thoroughly discussed by the therapist in the FPT-CP first phase. However, as it is a child-focused intervention, a couple therapy and/or more appropriate interventions for family needs were recommended.

An *ad-hoc* socio-demographic questionnaire was given to families before treatment. At the end of the 1st and 6th sessions (marking the FPT-CP first phase) parents completed self-reports about the therapeutic alliance and parenting stress. Parallel alliance measures were completed by therapists as well.

In order to assess changes in the quality of adult-child relationships, dyadic interactions were evaluated at the beginning of the 2nd (before treatment) and during the 7th (where only data collection occurred without treatment) sessions. Assessments took place during two consecutive 10-min sessions video recorded continuously by a female filmer at the Psychological Consultation Center for Children and Parents (Department of Psychology, University of Bologna). In a quiet room parents were asked to play individually with their child in ways they typically would and to disregard the filmer's presence as much as possible. A set of standard, age-appropriate toys

was used and families were allowed to use any toys and puppets provided.

Statistical Analysis

Data analysis was performed using IBM SPSS version 20.0 for Windows. A $p < 0.05$ indicated statistical significance.

The first section of Results provide descriptive statistics for each WAI-SF and SOFTA-S scale for mothers, fathers and therapists at two time points (T1 and T2). Student's t -test was used to examine differences between males and females and, moreover, to compare each parent and therapist alliance scores. For what concerns the SOFTA-S—that measures the alliance perceived by the therapist with the family as a “unit”—firstly a family score was calculated for each scale (the average ratings of mothers and fathers). Secondly, unpaired t -tests were conducted to analyze differences between the therapist and the family alliance scores. The following sections present group comparisons between mothers and fathers in terms of parent PSI-SF and parent and child EAS mean scores.

RESULTS

Ages of mothers and fathers ranged from 34 to 53 years ($M = 41.41$, $SD = 5.04$) and 32 to 48 years ($M = 42.41$, $SD = 4.76$), respectively. Children aged 2–5 ($M = 3.87$, $SD = 1.43$) were referred for evacuation (60%) or eating (40%) problems. Parents were Italian, married (88.2%) or cohabiting, and all of them were employed. With regards to educational level, most mothers had a university degree (82.3%), and a few completed only secondary (11.8%) or middle school (5.9%). Like the mothers, most of the fathers obtained an academic degree (64.7%), while smaller percentages finished secondary (11.8%) or middle school (23.5%).

Alliance

Table 1 presents descriptive statistics for the WAI-SF and SOFTA-S total scores at the 1st (T1) and 6th (T2) sessions. Parent and therapist alliance scores were high and indicative of a positive alliance at each time of assessment (27, 38). Moreover, paired t -tests did not reveal significant differences between T1 and T2 thus confirming the development and maintenance of a good parent-therapist alliance throughout the first FPT-CP 6 sessions.

While parents did not significantly differ in the WAI-SF scores, at T1 the therapist ratings of alliance with mothers were significantly higher than those ones with fathers [WAI-SF Total: $M_{\text{therapist-mother}} = 59.12$ vs. $M_{\text{therapist-father}} = 54.00$; $t_{(16)} = 2.57$, $p = 0.02$]. Differences did not emerge at T2.

For what concerns the SOFTA-S, the therapist scores were significantly lower than the family ratings of alliance at both time points [SOFTA-S Total: T1 $M_{\text{therapist}} = 55.76$ vs. $M_{\text{family}} = 68.09$, $t_{(32)} = 4.47$, $p = 0.00$; T2 $M_{\text{therapist}} = 57.65$ vs. $M_{\text{family}} = 67.71$, $t_{(32)} = 3.54$, $p = 0.00$].

Parenting Stress

Descriptive statistics for the PSI-SF are reported in **Table 2**. No differences emerged between T1 and T2, although fathers showed

TABLE 1 | Means, SDs of WAI-SF and SOFTA-S at T1 and T2, and tests for differences.

	T1	T2	$t_{(16)}$	p	d
	M ± SD	M ± SD			
MATERNAL SCALES					
WAI-SF total	70.71 ± 8.61	70.53 ± 8.24	0.07	0.94	0.02
SOFTA-S total	68.12 ± 7.79	67.29 ± 7.77	0.43	0.67	0.11
PATERNAL SCALES					
WAI-SF total	70.47 ± 11.09	68.00 ± 8.75	0.90	0.38	0.25
SOFTA-S total	68.06 ± 7.04	68.12 ± 5.97	-0.04	0.97	0.01
THERAPIST SCALES					
WAI-SF t-m total	59.12 ± 8.74	60.06 ± 11.03	-0.38	0.71	0.09
WAI-SF t-f total	54.00 ± 11.41	55.88 ± 11.71	-0.75	0.46	0.16
SOFTA-S t-family total	55.76 ± 9.24	57.65 ± 9.91	-0.89	0.39	0.20

t-m, therapist's alliance with mother; t-f, therapist's alliance with father.

TABLE 2 | Means, SDs of PSI-SF at T1 and T2, and tests for differences.

	T1	T2	$t_{(16)}$	p	d
	M ± SD	M ± SD			
MATERNAL SCALES					
Parental distress	28.88 ± 9.02	29.18 ± 8.45	-0.24	0.81	0.03
Parent-child dysfunctional interaction	23.12 ± 5.80	22.12 ± 5.69	0.82	0.42	0.17
Difficult child	31.94 ± 8.59	30.94 ± 8.09	0.72	0.48	0.12
Total	83.94 ± 18.77	82.24 ± 18.10	0.54	0.60	0.09
PATERNAL SCALES					
Parental distress	27.41 ± 6.57	28.71 ± 6.89	-0.95	0.36	0.19
Parent-child dysfunctional interaction	23.71 ± 6.53	25.06 ± 6.15	-0.99	0.34	0.21
Difficult child	31.65 ± 6.90	33.29 ± 6.18	-0.85	0.41	0.25
Total	82.76 ± 14.18	87.06 ± 13.16	-1.35	0.20	0.31

a trend with increased stress scores—from session one to session six—that did not reach statistical significance.

According to the PSI-SF manual (44) mothers reported high levels of stress on the Difficult Child Scale (T1: 90th percentile, T2: 85th percentile), while fathers obtained clinically significant scores on the Difficult Child scale (T1: 85th percentile, T2: 90th percentile) and on the Total score as well (T1: 80th percentile—still not clinically relevant, T2: 85th percentile).

Parent-Child Interactions

Table 3 reports mean scores on the parental and child dimensions of the EAS. No statistically significant differences emerged between T1 and T2.

According to the EAS manual (45), mothers reported problems on the dimension of Structuring (T1: $M = 4.94$, T2: $M = 4.65$), and children on the Involvement scale (T1: $M = 4.85$, T2: $M = 5.12$). With regards to fathers in the present sample, they reported problematic scores on the two dimensions of Sensitivity (T1: $M = 4.59$, T2: $M = 4.88$) and Structuring (T1:

$M = 3.77$, T2: $M = 4.38$), and children on the Responsiveness (T1: $M = 4.65$, T2: $M = 4.79$) and Involvement (T1: $M = 3.79$, T2: $M = 4.00$) scales.

DISCUSSION

Attention to the parental engagement in child treatment has recently increased given the emphasis on implementing successful treatments into community settings, identifying methods to provide services more efficiently, and improving quality of care for children and families (47–49). The study described herein focused on the FPT-CP as a child-focused psychotherapeutic technique designed for eating and evacuation disorders during preschool years. As discussed above, main purposes of this intervention are re-establishing the natural valence of food and corporal contents for children while supporting adults to re-evaluate their parental abilities. Our first goal was to explore the quality of the parent-therapist relationship during the first FPT-CP 6 sessions aimed to the promotion of the therapeutic alliance with parents and to the assessment of child's symptoms within family dynamics. We investigated also the potential effects of these initial sessions in reducing parental levels of stress and improving the quality of adult-child relationships.

Regarding our first hypothesis, results confirmed our expectations. High levels of parent-therapist alliance were promoted and maintained throughout the FPT-CP first phase. Parents were highly motivated and in need of help for their child's problems and, since the beginning of the intervention, they trusted in the therapist's ability to help them. At the same time the intra-family collaboration was consistently promoted by therapists who worked to build a positive family emotional climate that was necessary for the child and family disclosure throughout sessions. In this regard the use of the SOFTA-S allowed to evaluate some specific characteristics of a conjoint psychotherapeutic setting (with more than one family member) where the family productive collaboration and shared sense of purpose are strictly associated to therapeutic outcomes.

In the present study gender differences were taken into account. As expected, while we did not find differences between mother and father alliance scores, parental ratings of alliance were significantly higher than the therapist scores. These results were not surprising since the client and therapist views of alliance can diverge (50, 51). Therapist's perceptions of alliance might be affected by the theoretical knowledge and, most importantly, clients in the present sample were highly motivated and the family access to the Service was voluntary.

Instead unexpected results were obtained when comparing the therapist's ratings of alliance with mothers and fathers. Interestingly we found that, at the end of the FPT-CP 1st session, the therapist-mother alliance scores were significantly higher than the therapist-father ratings of alliance. Since the therapist sample consisted of women only, possible explanations of these results may come from the social psychology studies according to which people of the same sex tend to view the world through the same gender lens, which in turn might lead

TABLE 3 | Means, SDs of EAS at T1 and T2, and tests for differences.

	T1	T2	<i>t</i> (16)	<i>p</i>	<i>d</i>
	<i>M</i> ± <i>SD</i>	<i>M</i> ± <i>SD</i>			
MOTHER-CHILD SCALES					
Sensitivity	5.97 ± 1.12	5.91 ± 1.19	0.33	0.74	0.05
Structuring	4.94 ± 1.33	4.65 ± 1.28	1.13	0.28	0.22
Non-Intrusiveness	6.32 ± 0.87	6.03 ± 1.18	1.21	0.24	0.28
Non-Hostility	6.62 ± 0.49	6.59 ± 0.59	0.44	0.67	0.06
Responsiveness	5.47 ± 1.39	5.59 ± 1.54	−0.32	0.75	0.08
Involvement	4.85 ± 1.30	5.12 ± 1.67	−0.77	0.45	0.18
FATHER-CHILD SCALES					
Sensitivity	4.59 ± 1.53	4.88 ± 1.59	−0.77	0.45	0.19
Structuring	3.77 ± 1.39	4.38 ± 1.71	−1.84	0.09	0.39
Non-Intrusiveness	5.94 ± 0.68	5.94 ± 0.68	0.00	1.00	0.00
Non-Hostility	6.56 ± 0.66	6.38 ± 0.86	1.14	0.27	0.23
Responsiveness	4.65 ± 1.61	4.79 ± 1.80	−0.43	0.67	0.08
Involvement	3.79 ± 1.68	4.00 ± 1.94	−0.82	0.42	0.12

to similar life-perspectives (52). What is relevant herein is that, at the end of the FPT-CP 6th session, there were no differences between therapist-mother and therapist-father alliance scores. In other words, it seems that the building of the therapeutic relationship with fathers—as much positive as with mothers—was not immediate but it occurred throughout the first 6 sessions (by the therapist side).

Nowadays very little information is available about the effects of involving fathers in child treatment. Despite many aspects have been changed in the distribution of parental responsibilities, mothers are often exclusive participants in the early child intervention service delivery (53). Indeed to a certain extent there is still the belief that fathers have a limited role in childcare, or that they are difficult to recruit in child treatment (54, 55). Hence findings from the present research shed light on the importance of new research on those therapist factors that might contribute to the psychotherapy process and outcome. Among them are the therapist gender, expectations, stereotypes, and internal attitudes that are shaped and re-shaped over the course of treatment (56).

As previously discussed, without early diagnosis and effective child and family treatments, eating and evacuation disorders can cause serious child medical problems and high levels of parental maladjustment to cope with child difficulties. In line with our second hypothesis, we found high levels of parental distress on the Difficult Child scale that measures how much parents perceive the child as difficult or easy to manage (43). Unexpectedly, although scores did not significantly decrease from the 1st to the 6th sessions, at a qualitative level mothers and fathers reported different patterns of stress development. While maternal perceptions of the child as “difficult” started to change toward a deeper understanding of parent-child difficulties, father stress scores slightly increased on the Difficult Child and Total scales. Most probably, at the end of the FPT-CP first phase fathers were more involved in family life and they achieved a greater awareness about the existing problems thus leading to somewhat higher levels of distress.

Regarding our third goal, we found that mothers and fathers reported problems on the Structuring scale that refers to the adult capacity to appropriately facilitate, scaffold, or organize the child play. Specifically they showed over-structuring or attempts to structure that were not well-received by the child and that, at the end, were unsuccessful. These results are consistent with the etiology of eating and evacuation disorders during the preschool years where child’s emerging needs of autonomy can conflict with family. It is interesting to note that fathers only reported low levels of emotional availability showing a warm and kind parental attitude though not sensitive to child cues and communications. It might be that, compared to mothers, fathers were less used to interact with their children and to interpret their signals and behaviors.

Overall findings from the present research show that the first FPT-CP 6 sessions were effective in promoting a positive parent-therapist alliance as a pre-condition for a successful child and family treatment. However, changes in parental levels of distress and parent-child relationships did not reach statistical significance and we can speculate that more sessions were needed to obtain a remission of child symptoms.

Some limitations of the study must be considered when interpreting our results. Firstly, due to the small sample size, findings should be replicated on larger samples and results should be interpreted with caution. Secondly, the use of the alliance questionnaires did not allow to capture specific client and therapist behaviors that shape the alliance during treatment. It would be interesting to explore through further longitudinal studies how the pattern of alliance, stress and adult-child interactions observed herein would evolve in a longitudinal way. Moreover, future research would benefit from investigating the parent-therapist alliance in the context of different models of child-focused treatment.

Despite these limitations, findings from the present research would highlight relevant clinical implications. It is well-known that, without early treatments, eating and evacuation disorders tend to persist into adulthood with serious effects on physical and mental health (12, 13). The FPT-CP has been designed for eating and evacuation disorders in preschool children usually connected to parent-child relationship problems. During sessions parents are trained to be more sensitive toward child’s needs and they start to re-evaluate their parental abilities in supporting child’s emerging needs of autonomy in his relationship with food and corporal contents. This clinical methodology is characterized by the use of play as a narrative and central dimension of child/family problems (24). Furthermore, it is based on a high parental engagement in therapy sessions as precondition for successful clinical outcomes. Therapists with expertise in the use of the FPT-CP are trained to achieve high levels of parental session-engagement through the building of a strong parent-therapist alliance. Parents at risk for poorer alliance are identified and the early intervention is adapted to improve early alliance and to reduce dropouts.

To conclude, for the above mentioned reasons, the FPT-CP is a specific child-focused intervention that might represent a preventive model to apply to clinical contexts both public and private ones. Future research efforts should develop treatments

for preschoolers based on parent-professional alliance and aimed to provide psychological support to families and to enhance the parental abilities to cope with child diseases in preschool years.

AUTHOR CONTRIBUTIONS

IC and ET contributed to the conception and design of the study. IC acquired, analyzed, and interpreted data. IC and FA drafted and reviewed the initial and final manuscript as submitted. PS and IM collected data and they gave technical support and advice.

REFERENCES

- Hudson LD, Court AJ. What paediatricians should know about eating disorders in children and young people. *J Paediatr Child Health*. (2012) 48:869–75. doi: 10.1111/j.1440-1754.2012.02433.x
- Keren M. Eating and feeding disorders in the first five years of life: revising the DC:0-3R diagnostic classification of mental health and developmental disorders of infancy and early childhood and rationale for the new DC:0-5 proposed criteria. *Infant Ment Health J*. (2016) 37:498–508. doi: 10.1002/imhj.21588
- McDermott BM, Mamun AA, Najman JM, Williams GM, O'Callaghan MJ, Bor W. Preschool children perceived by mothers as irregular eaters: physical and psychosocial predictors from a birth cohort study. *J Dev Behav Pediatr*. (2008) 29:197–205. doi: 10.1097/DBP.0b013e318163c388
- Bryant-Waugh RJ, Markaham L, Kreipe RE, Walsh BT. Feeding and eating disorders in childhood. *Int J Eat Disord*. (2010) 43:98–111. doi: 10.1002/eat.20795
- Manikam R, Perman IA. Pediatric feeding disorders. *J Clin Gastroenterol*. (2000) 30:34–46. doi: 10.1097/00004836-200001000-00007
- Blum NJ, Taubman B, Nemeth N. Relationship between age at initiation of toilet training and duration of training: a prospective study. *Pediatrics*. (2003) 111:810–14. doi: 10.1542/peds.111.4.810
- Philichi L. When the going gets tough: pediatric constipation and encopresis. *Gastroenterol Nurs*. (2008) 31:121–130. doi: 10.1097/01.SGA.0000316531.31366.27
- Schonwald A, Sherritt L, Stadler A, Bridgemohan C. Factors associated with difficult toilet training. *Pediatrics*. (2004) 113:1753–57. doi: 10.1542/peds.113.6.1753
- Chase JW, Homsy Y, Siggaard C, Sit F, Bower WF. Functional constipation in children. *J Urol*. (2004) 171:2641–43. doi: 10.1097/01.ju.0000109743.12526.42
- van den Berg MM, Benninga MA, Di Lorenzo C. Epidemiology of childhood constipation: a systematic review. *Am J Gastroenterol*. (2006) 101:2401–09. doi: 10.1111/j.1572-0241.2006.00771.x
- Burgers R, Benninga MA. Functional non retentive fecal incontinence in children: a frustrating and long-lasting clinical entity. *J Paediatr Gastroenterol Nutr*. (2009) 48:98–100. doi: 10.1097/MPG.0b013e3181a15ec6
- Bongers ME, van Wijk MP, Reitsma JB, Benninga MA. Long-term prognosis for childhood constipation: clinical outcomes in adulthood. *Pediatrics*. (2010) 126:156–62. doi: 10.1542/peds.2009-1009
- McDermott BM, Mamun AA, Najman JM, Williams GM, O'Callaghan MJ, Bor W. Longitudinal correlates of the persistence of irregular eating from age 5 to 14 years. *Acta Paediatr*. (2010) 99:68–71. doi: 10.1111/j.1651-2227.2009.01517.x
- Trombini E, Trombini G. Focal play-therapy and eating behavior self-regulation in preschool children. *Gestalt Theory*. (2007) 29:294–301.
- Trombini E. *L'opposizione Infantile. Ostinazione e Protesta Psicosomatica*. Padova: Upsel Domeneghini (2002).
- Trombini E. *Psicoterapia Dei Disturbi Alimentari ed Evacuativi in Età Prescolare*. Macerata: Edizioni Simple (2008).
- Trombini E. *Il Cibo Rifiutato: i Disturbi Alimentari Precoci e la Giocoterapia Focale con Bambini E Genitori*. Bologna: Pendragon (2010).
- Trombini G. Sull'esistenza e comparsa della motivazione a fare-da-solo nel campo alimentare ed evacuativo. *Riv Psicol*. (1969) 2:111–31.
- Cohn L. Parents' voices: what they say is important in the treatment and recovery process. *Eat Disord*. (2005) 13:419–28. doi: 10.1080/10640260591005317
- Cottee-Lane D, Pistrang N, Bryant-Waugh R. Childhood onset anorexia nervosa: the experience of parents. *Eur Eat Disord Rev*. (2004) 12:169–77. doi: 10.1002/erv.560
- Zabala MJ, MacDonald P, Treasure J. Appraisal of caregiving burden, expressed emotion and psychological distress in families of people with eating disorders: a systematic review. *Eur Eat Disord Rev*. (2009) 17:338–49. doi: 10.1002/erv.925
- Svensson E, Nilsson K, Levi R, Suarez NC. Parents' experiences of having and caring for a child with an eating disorder. *Eat Disord*. (2013) 21:395–407. doi: 10.1080/10640266.2013.827537
- Vallino D. La consultazione partecipata. *Riv Psicoanal*. (2002) 2:325–43.
- Vallino D. *Fare Psicoanalisi Con Genitori e Bambini*. Roma: Borla (2009).
- Trombini E. *Genitori e figli in Consultazione*. Urbino: QuattroVenti (2004).
- Ardito RB, Rabellino D. Therapeutic alliance and outcome of psychotherapy: historical excursus, measurements, and prospects for research. *Front Psychol*. (2011) 2:1–11. doi: 10.3389/fpsyg.2011.00270
- Lingiardi V. *L'alleanza Terapeutica: Teoria, Ricerca e Clinica*. Milano: Raffaello Cortina (2002).
- Kazdin AE, Whitley MK. Pretreatment social relations, therapeutic alliance, and improvements in parenting practices in parent management training. *J Consult Clin Psychol*. (2006) 74:346–55. doi: 10.1037/0022-006X.74.2.346
- Kazdin AE, Whitley MK, Marciano PL. Child-therapist and parent-therapist alliance and therapeutic change in the treatment of children referred for oppositional, aggressive, and antisocial behavior. *J Child Psychol Psychiatr*. (2006) 47:436–45. doi: 10.1111/j.1469-7610.2005.01475.x
- McLeod, BD. The relation of the alliance with outcomes in youth psychotherapy: a meta-analysis. *Clin Psychol Rev*. (2011) 31:603–16. doi: 10.1016/j.cpr.2011.02.001
- de Greef M, Pijnenburg HM, van Hattum MJC, McLeod BD, Scholte RHJ. Parent-professional alliance and outcomes of child, parent, and family treatment: a systematic review. *J Child Fam Stud*. (2017) 26:961–76. doi: 10.1007/s10826-016-0620-5
- Trombini E, Trombini G. Focal play-therapy in the extended child-parents context. A clinical case. *Gestalt Theory*. (2006) 28:375–88.
- Trombini E. Disturbi alimentari ed evacuativi in età prescolare. In: Vallino D, Macciò M, editors. *Famiglie-Quaderni di Psicoterapia Infantile*. Roma: Borla (2011).
- Trombini E. La Giocoterapia Focale in età prescolare. In: De Campora G, Zavattini GC, editors. *Mindfulness e Disturbi Alimentari*. Bologna: Il Mulino (2016).
- Tracey TJ, Kokotovic AM. Factor structure of the working alliance inventory. *J Consult Clin Psychol*. (1989) 37:369–75. doi: 10.1037/1040-3590.1.3.207
- Lingiardi V, Filippucci L. Trauma e memoria tra psicoanalisi e neuroscienze. *Maltrattamento e Abuso all'Infanzia*. (2002) 4:35–60.
- Friedlander ML, Escudero V, Heatherington L. *Therapeutic Alliances with Couples and Families: An Empirically-Informed Guide to Practice*. Washington, DC: American Psychological Association (2006).
- Mazzoni S. *Alleanze Terapeutiche Nella Terapia di Coppia e della Famiglia*. Roma: Firera & Liuzzo Group (2010).

All authors contributed to the manuscript revision, read, and approved the submitted version.

ACKNOWLEDGMENTS

Thanks must be given to the clinical research staff at the Psychological Consultation Center for Children and Parents (Department of Psychology, University of Bologna, Italy) for the help and valuable support in the study. We would particularly like to thank all participants whose efforts made this study possible.

39. Hanson WE, Curry KT, Bandalos DL. Reliability generalization of Working Alliance Inventory scale scores. *Edu Psychol Meas.* (2002) 62:659–73. doi: 10.1177/001316402128775076
40. Cronbach LJ. Internal consistency of tests: analyses old and new. *Psychometrika.* (1988) 53:63–70.
41. Friedlander ML, Escudero V, Heatherington L, Diamond GM. Alliance in couple and family therapy. *Psychotherapy.* (2011) 48:25–33. doi: 10.1037/a0022060
42. Friedlander ML, Lambert JE, Muniz de la Pena C. A step toward disentangling the alliance/improvement cycle in family therapy. *J Couns Psychol.* (2008) 55:118–24. doi: 10.1037/0022-0167.55
43. Abidin RR. *Parenting Stress Index.* 3rd ed. Odessa, FL: Psychological Assessment Resources (1995).
44. Guarino A, Di Blasio P, D'Alessio M, Camisasca E, Serantoni G. *Parenting Stress Index, Forma Breve.* Firenze: Organizzazioni Speciali (2008).
45. Biringen Z. *The Emotional Availability Scales.* 4th ed. (2008). Retrieved from: www.emotionalavailability.com
46. Biringen Z. Emotional availability: conceptualization and research findings. *Am J Psychiatr.* (2000) 70:104–14. doi: 10.1037/h0087711
47. Becker KD, Lee BR, Daleiden EL, Lindsey M, Brandt NE, Chorpita BF. The common elements of engagement in children's mental health services: which elements for which outcomes? *J Clin Child Adolesc Psychol.* (2015) 44:30–43. doi: 10.1080/15374416.2013.814543
48. Gopalan G, Goldstein L, Klingenstein K, Sicher C, Blake C, McKay MM. Engaging families into child mental health treatment: updates and special considerations. *J Can Acad Child Adolesc Psychiatr.* (2010) 19:182–96.
49. Ingoldsby EM. Review of interventions to improve family engagement and retention in parent and child mental health programs. *J Child Fam Stud.* (2010) 19:629–45. doi: 10.1007/s10826-009-9350-2
50. Fitzpatrick MR, Iwakabe S, Stalikas A. Perspective divergence in the working alliance. *Psychother Res.* (2005) 15:69–79. doi: 10.1080/10503300512331327056
51. Kramer U, de Roten Y, Beretta V, Michel L, Despland JN. Patient's and therapist's views of early alliance building in dynamic psychotherapy: patterns and relation to outcome. *J Couns Psychol.* (2008) 55:89–95. doi: 10.1037/0022-0167.55.1.89
52. Bem S. Gender schema theory: a cognitive account of sex typing. *Psychol Rev.* (1981) 88:354–64. doi: 10.1037/0033-295X.88.4.354
53. Bruder MB. Family-centered early intervention: clarifying our values for the new millennium. *Topics Early Child Spec Edu.* (2000) 20:105–15. doi: 10.1177/027112140002000206
54. Phares V, Fields S, Binitie I. Getting fathers involved in child-related therapy. *Cogn Behav Pract.* (2006) 13:42–52. doi: 10.1016/j.cbpra.2005.06.002
55. Phares V, Lopez E, Fields S, Kamboukos D, Duhig AM. Are fathers involved in pediatric psychology research and treatment? *J Pediatr Psychol.* (2005) 30:631–43. doi: 10.1093/jpepsy/jsi050
56. Wampold BE. How important are the common factors in psychotherapy? An update. *World Psychiatr.* (2015) 14:270–77. doi: 10.1002/wps.20238

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Chirico, Andrei, Salvatori, Malaguti and Trombini. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



School Climate, Loneliness, and Problematic Online Game Use Among Chinese Adolescents: The Moderating Effect of Intentional Self-Regulation

Chengfu Yu^{1,2,3}, Wentao Li³, Qiao Liang¹, Xuelan Liu^{3*}, Wei Zhang³, Hong Lu^{1,2*}, Kai Dou¹, Xiaodong Xie⁴ and Xiong Gan⁵

¹ School of Education, Guangzhou University, Guangzhou, China, ² School of Education, Center for Brain and Cognitive Sciences, Guangzhou University, Guangzhou, China, ³ School of Psychology, South China Normal University, Guangzhou, China, ⁴ Human Resources Department, South China Normal University, Guangzhou, China, ⁵ School of Education, Yangtze University, Jingzhou, China

OPEN ACCESS

Edited by:

Daniela Di Riso,
University of Padova, Italy

Reviewed by:

Xiaolin Zhou,
Peking University, China
Birsan Altay,
Ondokuz Mayıs University, Turkey

*Correspondence:

Xuelan Liu
liuxuelan@m.scnu.edu.cn
Hong Lu
luhong@gzhu.edu.cn

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 22 October 2018

Accepted: 02 April 2019

Published: 30 April 2019

Citation:

Yu C, Li W, Liang Q, Liu X, Zhang W, Lu H, Dou K, Xie X and Gan X (2019) School Climate, Loneliness, and Problematic Online Game Use Among Chinese Adolescents: The Moderating Effect of Intentional Self-Regulation. *Front. Public Health* 7:90. doi: 10.3389/fpubh.2019.00090

Evidently, the school climate is important in reducing adolescent problematic online game use (POGU); however, the mechanism accounting for this association remains largely unknown. This study examined whether loneliness mediated the link between school climate and adolescent POGU and whether this mediating process was moderated by adolescent intentional self-regulation. To this end, self-report questionnaires were distributed. Participants were 500 12–17-years-old Chinese adolescents ($Mean_{age} = 13.59$ years, 50.60% male). After controlling for adolescents' gender, age, family socioeconomic status, and self-esteem, the results showed that the negative association between school climate and adolescent POGU was partially mediated by loneliness. Moreover, this indirect link was stronger for adolescents with low intentional self-regulation than for those with high intentional self-regulation. These findings highlight loneliness as a potential mechanism linking school climate to adolescent POGU and provide guidance for the development of effective interventions for addressing the adverse effects of a negative school climate.

Keywords: adolescent, school climate, problematic online game use (POGU), loneliness, intentional self-regulation

INTRODUCTION

Over the past two decades, problematic online game use (POGU) as a global public health issue has received increasing research interest (1–3). POGU, a subtype of problematic Internet use, refers to the uncontrollable, excessive, and compulsive use of online games that causes social and/or emotional problems (4). Individuals with POGU spend more time gaming than planned at the expense of other important activities, causing negative social and academic outcomes. Increasing evidence has consistently confirmed that POGU is associated with a variety of negative outcomes such as poor academic performance, depression, and aggression (3, 5, 6). Specifically, China has one of the highest adolescent POGU prevalence rates in the world raging between 2.2 and 21.5%

(1, 7, 8). Therefore, an investigation of the factors that predict POGU is urgently needed to support the development of intervention programs.

Given that adolescents spend an increasing amount of their time engaged in school-related tasks, the influence of school contexts on adolescent development has received increased attention in the past decade (9–11). School climate refers to all relationships that affect children's cognitive, social, and psychological development, including adult-adult, adult-student, student-student, family-school, and community-school relationships (9, 12). However, perceptions of specific school climate may vary greatly across individuals.

According to the stage-environment fit theory (13, 14), optimal development takes place when school contexts adequately satisfy adolescents' increasing psychological needs for autonomy, relatedness, and competence. In this study, we primarily focused on three components of school climate: teacher support, student-student support, and opportunities for autonomy at school. Particularly, teacher support and student-student support may help meet adolescents' relatedness and competence needs. Moreover, teacher autonomy support can help to satisfy students' needs for autonomy, as well as offer students the opportunity to achieve competence and establish positive interactions with teachers and peers (15, 16). There is considerable evidence suggesting that students' perceptions of relatedness and autonomy in the school setting influence adolescents' academic adjustment as well as their physical and socio-emotional well-being (9, 17, 18). By the same token, a mismatch between school climate and the three aforementioned psychological needs can result in problem behaviors such as POGU.

Research has indicated that adolescents who perceive the school climate as favorable are less likely to develop POGU (10, 11, 19). For instance, Rehbein and Baier (11) found that students' perceptions of favorable school climates were an important protective factor against POGU in a 5-year longitudinal study of 406 students in grades 4–9. Similarly, Yu et al. (19) reported that 7th grade adolescents who perceived opportunities for autonomy at school had a decreased incidence of 9th grade POGU; this association was mediated via increased 8th grade basic psychological needs satisfaction and 9th grade school engagement. These findings highlight the merit of favorable school climate in reducing adolescent POGU.

LONELINESS AS A MEDIATOR

Although the association between school climate and adolescent POGU has been well-established, the mediating and moderating mechanisms underlying this relation are still under-investigated. Loneliness is prevalent in adolescents (20). According to the self-system processes model (21), a favorable school climate helps to reduce the degree of loneliness experienced by adolescents, which in turn reduces the risk of problem behaviors. In other words, loneliness may be an important mediator of the link between school climate and adolescent problem behaviors. When adolescents' socio-emotional needs are not adequately met by contextual factors such as school climate, the feeling of loneliness

occurs (22). Moreover, adolescents suffering from loneliness are at elevated risk for POGU (5).

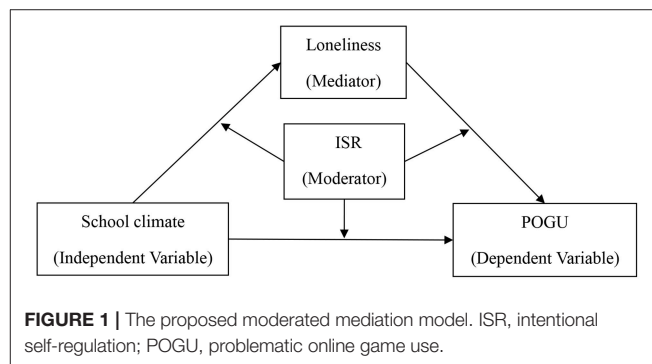
From one perspective, a school climate that responds to adolescent psychological needs for relatedness, competence, and autonomy, renders adolescents less likely to experience loneliness. Ample research evidence has confirmed the negative association between a favorable school climate and loneliness (23–25). For instance, Benner (23) reported that a positive school climate was negatively associated with loneliness. Similarly, Liu et al. (24) and Yu (25) found that junior middle school students who had more favorable school climate perceptions (positive teacher-student support, student-student support, and opportunities for autonomy at school) were less likely to experience loneliness.

From another perspective, when adolescents experience loneliness, they are more likely to indulge in online games. Growing numbers of studies support the important effect of loneliness in shaping adolescent POGU (5, 6, 26). For instance, Caplan et al. (26) found that loneliness was positively associated with POGU. Similarly, Qin (27) found that loneliness was a risk factor for POGU. In addition, Lemmens et al. (6) reported that loneliness was a significant and powerful predictor of POGU. Moreover, Chen and Fu (5) found that adolescents with POGU scored significantly higher on measures of loneliness than did adolescents without POGU. Taken together, these data led to the following hypothesis:

Hypothesis 1: Loneliness will mediate the relationship between school climate and adolescent POGU.

INTENTIONAL SELF-REGULATION AS A MODERATOR

Despite that a robust relationship between school climate and adolescent POGU has been suggested in previous research, not all adolescents who experience a negative school climate develop POGU; some adolescents still adapt well even though they have negative perceptions of their school climate. Similarly, some adolescents still experience maladjustment even though they perceive their school climate favorably. Such variability in adolescents' responses to the school environment suggests that individual characteristics may play a key role in this observed heterogeneity.



According to the ecological system theory Bronfenbrenner (28), adolescents' development stems from the interplay between important contexts (such as school climate) and their intrapersonal characteristics. Among the many intrapersonal characteristics influencing adolescents' emotional problems (such as loneliness) and deviant behaviors, intentional self-regulation is an important moderator (29–31). Intentional self-regulation refers to one's efficiency in examining his/her abilities and negotiating his/her resources in the context of personal goals in order to attain better functioning and to enhance self-development (32, 33). Consequently, appropriate goals and goal-related strategies for attaining positive individual-context relations should be chosen (34). Thus, people with different levels of intentional self-regulation are influenced by contextual factors differently. More precisely, adolescents with good intentional self-regulation are more inclined to select suitable goals, optimize their own resources, and/or actively search for alternatives when failure happens, in turn increasing adjustment and reducing problem behaviors such as POGU (30, 32).

The risk-buffering hypothesis proposes that favorable personal characteristics such as intentional self-regulation can weaken the link between environmental stress (such as negative school climate) and problem behaviors (35). Consistent with this hypothesis, Urban et al. (31) found that intentional self-regulation moderated the relationship between neighborhood contexts and adolescent mental health symptoms, such that neighborhood risk factors were associated with increased mental health symptoms including loneliness, depression, and sadness among individuals with lower intentional self-regulation, but not among those with higher intentional self-regulation. This could be because adolescents with higher intentional self-regulation can obtain more coping resources from their neighborhood contexts. Similarly, adolescents with high intentional self-regulation tend to have clear goals and a vision for what they want to achieve, thus they can make good use of school resources and undergo more optimal development (such as less loneliness). Further, when faced with an unfavorable school climate, adolescents with high intentional self-regulation might be better able to focus on their goals and plans, thus reducing their sense of loneliness. Although they may experience setbacks and negative feelings (such as loneliness) when in a disadvantageous school climate, adolescents with excellent intentional self-regulation can adjust better and recover more quickly than those with poorer intentional self-regulation. Therefore, we proposed the following hypothesis:

Hypothesis 2: Intentional self-regulation will moderate the indirect link between school climate and adolescent POGU. Specifically, the indirect association between school climate and POGU via loneliness will be stronger among adolescents with low-level intentional self-regulation and weaker among adolescents with high-level intentional self-regulation.

THE PRESENT STUDY

Grounded in the self-system processes model and the ecological system theory, this study investigated whether loneliness

mediates the relation between school climate and adolescent POGU and whether this indirect link is moderated by intentional self-regulation. **Figure 1** illustrates the proposed research model.

METHOD

Participants

The participants in this study were recruited from two junior middle schools in Guangdong province, southern China, through stratified and random cluster sampling. A total of 500 adolescents (50.60% male) ranging in age from 12 to 17 ($\text{Mean}_{\text{age}} = 13.59$, $SD = 0.65$) participated in February 2019. Of those, 207 adolescents came from one school (Urban areas) while 293 came from the other (Rural areas). And Chi-square and *t*-tests showed that there were no differences between students from urban and rural areas.

Procedure

We obtained written informed consent from both participants themselves and their parents before beginning all data collection. The data were collected in classrooms by well-trained psychology graduate students. Before the formal test, data collectors informed participants that participation was voluntary and that any uncomfortable questions need not be answered. Participants were also assured that their responses would be kept strictly confidential and that they would only be used for academic survey research. Adolescents received a pencil for their participation. In addition, our testing material and survey procedures were approved by the ethics in human research committee of School of Education, Guangzhou University, and School of Psychology, South China Normal University.

Measures

Data were collected using School Climate Questionnaire, Intentional Self-regulation Questionnaire, Loneliness Scale, POGU Questionnaire, Parent-adolescent Relationship Questionnaire, and Impulsivity Scale.

School Climate

Adolescents reported perceived school climate using a 25-item version of a perceived school climate questionnaire (9). This questionnaire demonstrated good reliability and validity in Chinese adolescents (9, 18, 36). It assesses three dimensions: teacher-student support, student-student support, and opportunities for autonomy. Adolescents rated how often the statements applied to them on a 5-point scale ranging from 1 = never to 5 = always. The responses were averaged across the 25 items to form a composite score, with higher scores reflecting higher levels of positive school climate. For this study, the Cronbach's alpha was 0.86, which suggests that this questionnaire had fair internal consistency.

Intentional Self-Regulation

Adolescents reported their intentional self-regulation using a 9-item version of the intentional self-regulation questionnaire (29, 36). This questionnaire assesses three dimensions of intentional self-regulation: selection (e.g., "When I think about what I want in life, I commit myself to one or two important goals"),

TABLE 1 | Descriptive statistics and correlations for all variables.

Variables	1	2	3	4	5	6	7	8	9	10
1. Gender	1.00									
2. Age	0.08	1.00								
3. Area	−0.09	−0.20**	1.00							
4. FAR	0.09*	−0.05	−0.02	1.00						
5. MAR	0.10*	−0.03	−0.06	0.68**	1.00					
6. Impulsivity	0.01	−0.05	0.05	−0.28**	−0.34**	1.00				
7. School climate	−0.16**	−0.13**	−0.08	0.21**	0.22**	−0.31**	1.00			
8. ISR	0.04	−0.02	−0.08	0.18**	0.21**	−0.42**	0.32**	1.00		
9. Loneliness	0.01	−0.03	0.09	−0.23**	−0.25**	0.36**	−0.33**	−0.35**	1.00	
10. POGU	0.31**	0.04	−0.01	−0.13**	−0.18**	0.26**	−0.26**	−0.18**	0.24**	1.00
<i>M</i>	0.51	13.59	0.41	2.44	2.51	2.21	3.18	3.48	2.01	1.26
<i>SD</i>	0.50	0.55	0.49	0.37	0.36	0.40	0.38	0.62	0.51	1.96

Gender and area were dummy coded such that 1 = male, 0 = female, and 1 = urban, 0 = rural. FAR, father-adolescent relationship; MAR, mother-adolescent relationship; ISR, intentional self-regulation; POGU, problematic online game use. * $p < 0.05$, ** $p < 0.01$.

optimization (e.g., “When I want to achieve something difficult, I wait for the right moment and the best opportunity”), and compensation (e.g., “When things aren’t going so well, I accept help from others”). Adolescents indicated how true each item was of them on a 5-point scale ranging from 1 = not at all true to 5 = very true. Responses across the nine items were averaged, with higher scores representing higher levels of intentional self-regulation. For this study, the Cronbach’s alpha was 0.91, indicating that the scale had good internal consistency.

Loneliness

Adolescents reported their loneliness using the UCLA loneliness scale (37). This scale contains 20 items, which assess feelings of social isolation (e.g., “could not find companionship when I wanted it”). Participants rated the extent to which each statement applied to them on a 4-point scale ranging from 1 = not at all to 4 = always. Responses across the 20 items were averaged, with higher scores representing greater loneliness. For this study, the Cronbach’s alpha was 0.90, which indicated that the scale had good internal consistency.

POGU

POGU was measured using the Chinese version Problematic Online Game Use Questionnaire (19). The instrument has demonstrated good reliability and validity in Chinese adolescent samples (19, 38, 39). Adolescents rated how often each statement (e.g., “Have you spent more time playing online games than was planned?”) was true for them on a 3-point scale: 0 = never, 1 = sometimes, and 2 = yes. The answers were recoded into “never” = 0, “sometimes” = 0.5, and “yes” = 1. This mode of scoring is more accurate because it allows participants who “sometimes” experienced symptoms to be considered (19, 40). The grand total score of the 11 items was calculated, with higher scores representing greater severity of POGU. For this study, the Cronbach’s alpha was 0.89, which indicated that the questionnaire had good internal consistency.

Control Variables

Given that prior studies shown that adolescents’ gender, age, parent-adolescent relationship, and impulsivity were associated with POGU (40–42), we include them as control variables in statistical models. Parent-adolescent relationship was assessed using the Chinese version Parent-adolescent Relationship Questionnaire (43), and impulsivity was assessed using the Urgency-Premeditation-Perseverance-Sensation seeking-Positive Urgency (UPPS-P) Scale (44). For this study, father-adolescent relationship, mother-adolescent relationship, and impulsivity all demonstrated excellent internal consistency (Cronbach’s α are 0.78, 0.78, and 0.86 respectively).

Statistical Analyses

Descriptive statistics were conducted via use of SPSS 25.0. And Mplus 7.1 was utilized to examine mediation and moderation effects by conducting structural equation modeling analysis (45).

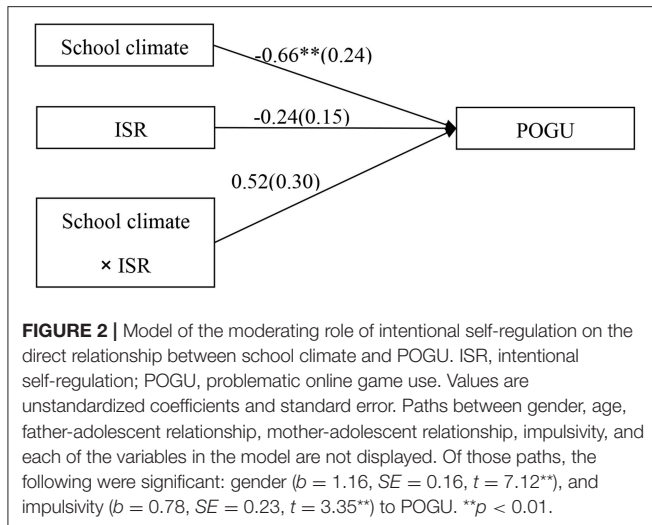
RESULTS

Prevalence of POGU

According to the opinions of POGU experts (4, 40), adolescents who exhibited at least 5 of the 11 criteria on the POGU questionnaire were considered to be addict gamers. In the current sample, 5.40% of the participants displayed signs of gaming addiction. This rate is consistent with national Chinese adolescent data (8) and recent literature (19).

Preliminary Analyses

The means, standard deviations, and correlation coefficients for all variables of the current study are displayed in **Table 1**. The results showed that school climate and intentional self-regulation were both negatively related to loneliness and POGU, whereas loneliness was positively related to POGU. These findings suggest that a negative school climate, low intentional self-regulation, and high loneliness all were potential risk factors for POGU, and a



negative school climate and low intentional self-regulation were both potential risk factors for loneliness.

Testing the Moderating Effect of Intentional Self-Regulation on the Direct Link Between School Climate and Adolescent POGU

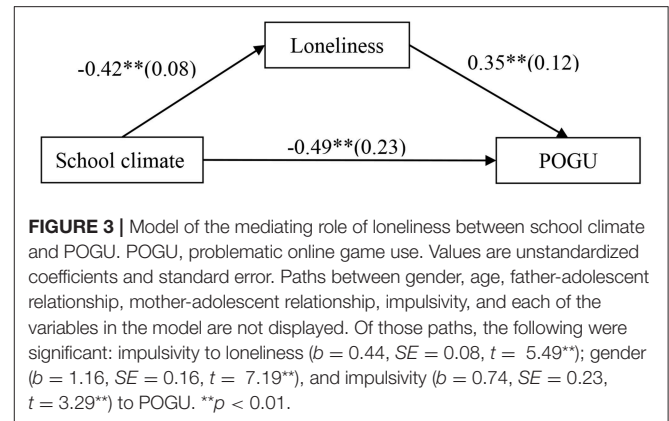
The moderated model which was shown in **Figure 2** revealed an acceptable fit to the data: $\chi^2/df = 4.29$, CFI = 0.91, RMSEA = 0.069. The results demonstrated that the main effects of school climate was significantly associated with POGU ($b = -0.66$, $SE = 0.24$, $t = -2.77$, $p < 0.01$), however, the main effects of intentional self-regulation ($b = -0.24$, $SE = 0.15$, $t = -1.64$, $p > 0.05$), and the interactive effect of school climate and intentional self-regulation ($b = 0.52$, $SE = 0.30$, $t = -1.75$, $p > 0.05$) were non-significantly associated with POGU.

Testing for Mediation Effect of Loneliness

The mediation model represented in **Figure 3** revealed an excellent fit to the data: $\chi^2/df = 2.39$, CFI = 0.96, RMSEA = 0.033. The results are displayed in **Figure 3**. School climate negatively predicted loneliness ($b = -0.42$, $SE = 0.08$, $t = -5.13$, $p < 0.01$) and negatively predicted POGU ($b = -0.49$, $SE = 0.23$, $t = -2.12$, $p < 0.05$), and loneliness positively predicted POGU ($b = 0.35$, $SE = 0.12$, $t = 2.86$, $p < 0.01$). Moreover, bootstrapping analyses indicated that loneliness partially mediated the relation between school climate and adolescent POGU (indirect effect = -0.1482 , $SE = 0.0676$, 95% CI = $[-0.3100, -0.0353]$).

Testing for Moderated Mediation

The moderated mediation model represented in **Figure 4** revealed a good fit to the data: $\chi^2/df = 3.16$, CFI = 0.92, RMSEA = 0.043. The bias-corrected percentile bootstrap results indicated that the indirect effect of school climate on adolescent POGU through loneliness was moderated by intentional self-regulation. Specifically, intentional self-regulation moderated the association between school climate and loneliness ($b = 0.28$, $SE = 0.11$, $t = 2.64$, $p < 0.01$). We conducted a simple slopes test, and as depicted in **Figure 5**, the negative link between



school climate and loneliness was much stronger for adolescents with lower intentional self-regulation (1SD below the mean; $b = -0.57$, $SE = 0.12$, $t = -4.85$, $p < 0.01$) than for adolescents with higher intentional self-regulation (1SD above the mean; $b = -0.23$, $SE = 0.09$, $t = -2.40$, $p < 0.05$). Moreover, school climate was negatively associated with loneliness ($b = -0.40$, $SE = 0.08$, $t = -4.73$, $p < 0.01$) and POGU ($b = -0.53$, $SE = 0.24$, $t = -2.21$, $p < 0.05$). However, the interaction between intentional self-regulation and loneliness in predicting adolescent POGU was no significant ($b = -0.03$, $SE = 0.18$, $t = -0.15$, $p > 0.05$).

Moreover, the indirect link between school climate and POGU via loneliness were significant for adolescents with lower intentional self-regulation (indirect effect = -0.17 , $SE = 0.07$, 95% CI = $[-0.32, -0.02]$) and for those with higher intentional self-regulation (indirect effect = -0.07 , $SE = 0.04$, 95% CI = $[-0.13, -0.01]$). Adolescents with lower intentional self-regulation were more likely to develop loneliness, which in turn contributed to higher levels of POGU.

DISCUSSION

The first goal of this study was to explore the mediating effect of loneliness on the relationship between school climate and adolescent POGU. Consistent with our hypothesis 1, this study found that loneliness significantly mediated the effect of school climate on adolescent POGU. Previous research has demonstrated that the school climate is associated with loneliness (23–25) and that the latter is associated with increased risk of POGU (5, 6, 26). We integrated these two links in the current study with a mediation modeling approach. The findings of this study suggest that loneliness is an essential underlying psychosocial process that helps explain why a favorable school climate is linked with less POGU and why a negative school climate is linked with more POGU. When adolescents have positive experiences, perceive more support from their teachers and peers, and report more autonomy, they are less likely to feel lonely, which in turn is associated with less POGU.

This finding is in line with the self-system processes model (21). It is also congruent with previous research showing that the protective effects of social context on adolescent developmental outcomes (i.e., school climate, social support, family climate)

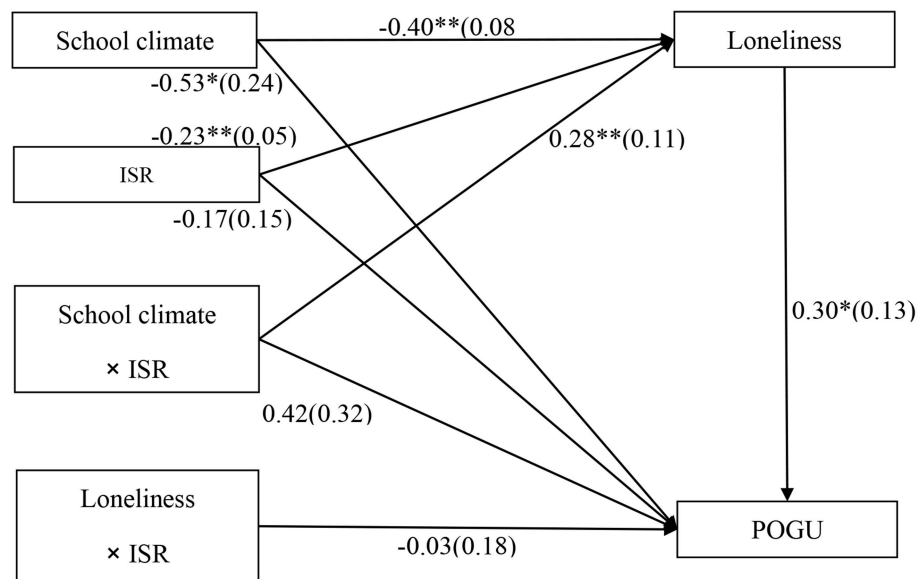


FIGURE 4 | Model of the moderating role of intentional self-regulation on the indirect relationship between school climate and POGU. ISR, intentional self-regulation; POGU, problematic online game use. Values are unstandardized coefficients and standard error. Paths between gender, age, father-adolescent relationship, mother-adolescent relationship, impulsivity, and each of the variables in the model are not displayed. Of those paths, the following were significant: impulsivity to loneliness ($b = 0.33$, $SE = 0.08$, $t = 3.91^{**}$); gender ($b = 1.16$, $SE = 0.16$, $t = 7.15^{**}$), and impulsivity ($b = 0.69$, $SE = 0.24$, $t = 2.89^{**}$) to POGU. $^{*}p < 0.05$, $^{**}p < 0.01$.

are mediated by psychological processes including loneliness (24, 46, 47). According to self-determination theory (48), contextual factors (i.e., school climate) influence adolescent behaviors (i.e., POGU) through the mediating effects of internal psychology. More concretely, when a school climate cannot satisfy an adolescent's need for autonomy and relatedness, he or she feels lonely and thus seeks an environment through which he/she can meet his/her psychological needs and reduce feelings of loneliness. Online games offer a setting in which people can express themselves in ways that they may not feel comfortable doing in real life, and it can also be a good place for people to make new friends and socialize. Survey research has indicated that players may gain a sense of belonging from an online game and that social communication and relationships are important motivators for engagement in online games (49). In contrast, when a school climate promotes positive emotional student-teacher and student-student bonds, students may not feel lonely at school. Thus, students tend to make efforts to control their behavior so that their actions will be in accordance with social expectations and are therefore less likely to become addicted to online games. Therefore, a positive school climate may be effective in treating loneliness, which may be a promising approach for adolescent POGU prevention and cessation.

The second goal of this study was to explore the moderating effect of intentional self-regulation on the indirect association between school climate and POGU via loneliness. Consistent with the risk-buffering hypothesis and with our own hypothesis, this study found that intentional self-regulation weakened the link between school climate, loneliness, and POGU through the direct relationship between school climate and

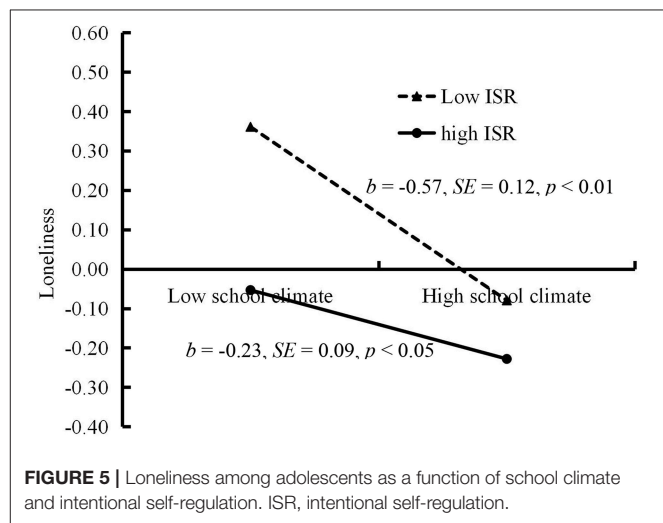


FIGURE 5 | Loneliness among adolescents as a function of school climate and intentional self-regulation. ISR, intentional self-regulation.

loneliness. Specifically, the negative association between school climate and loneliness was stronger among adolescents with low intentional self-regulation, which in turn increased their POGU. This is because adolescents with higher intentional self-regulation tend to have more resources and greater capacity to select appropriate goals, apply and refine relevant means of achieving positive outcomes, and avoid losses (32). This pattern of moderator effects has also been found in the association between environmental factors (i.e., school climate, family environment) and externalizing behaviors. For example, Lin et al. (50) reported that the negative link between school climate and adolescent smoking behavior

via deviant peer affiliation was substantially stronger among adolescents with lower intentional self-regulation than among those with higher intentional self-regulation. Similarly, Yuan (51) found that among adolescents with low intentional self-regulation, parental corporal punishment could have increased their deviant peer affiliation, which in turn increased POGU. In contrast, among adolescents with high intentional self-regulation, the relation was not significant. Although these studies have found that intentional self-regulation diminishes the indirect link between environmental factors and adolescent development, they used externalizing behaviors such as deviant peer affiliation as mediating variables rather than loneliness (50, 51). Therefore, this research extended the range of the moderating effect of intentional self-regulation to internalizing behaviors by loneliness.

This study also examined whether the relationship between loneliness and adolescent POGU was moderated by intentional self-regulation. The findings showed that this moderating effect was non-significant. These findings suggest that intentional self-regulation can help to promote a positive school climate and reduce adolescent loneliness, which in turn can reduce the risk of POGU. However, intentional self-regulation cannot eliminate the risk of adolescent POGU merely due to its effects on loneliness. Even so, this study contributes to the literature by enhancing our understanding of adolescent POGU etiology and suggesting the potential success of improving intentional self-regulation as a personal capability in POGU intervention programs.

Practical Implications

The findings of this study have important theoretical and practical implications. Our findings suggest that loneliness is an important mediator in the relation between perceived school climate and POGU. Thus, teachers and parents may prevent adolescent POGU and intervene in this behavior by reducing adolescents' loneliness. Moreover, our findings suggest that the negative link between school climate and adolescent POGU through loneliness is stronger for adolescents with poor intentional self-regulation than for those with high intentional self-regulation. Therefore, it is important to foster more positive perceptions of school climate among adolescents, especially among those with poor intentional self-regulation.

REFERENCES

- Griffiths MD, Király O, Pontes HM, Demetrovics Z. An overview of pathological gaming. In: Starcevic V, Aboujaoude E, editors. *Mental Health in the Digital Age: Grave Dangers, Great Promise*. Oxford: Oxford University Press (2015) 27–45.
- Hu J, Zhen S, Yu C, Zhang Q, Zhang W. Sensation seeking and online gaming addiction in adolescents: a moderated mediation model of positive affective associations and impulsivity. *Front Psychol.* 8:699. doi: 10.3389/fpsyg.2017.00699
- Smohai M, Urbán R, Griffiths MD, Király O, Mirnics Z, Vargha A, et al. Online and offline video game use in adolescents: measurement invariance and problem severity. *Am J Drug Alcohol Abuse.* (2017) 43:111–6. doi: 10.1080/00952990.2016.1240798
- Young KS, de Abreu CN. *Internet Addiction: A Handbook and Guide to Evaluation and Treatment*. Hoboken, NJ: John Wiley (2011).
- Chen H, Fu C. The relationship between loneliness, self-esteem and online game addiction among college students. *J Campus Life Ment Health.* (2012) 10:374–6. doi: 10.19521/j.cnki.1673-1662.2017.05.017
- Lemmens JS, Valkenburg PM, Peter J. Psychosocial causes and consequences of pathological gaming. *Comput Hum Behav.* (2011) 27:144–52. doi: 10.1016/j.chb.2010.07.015
- Su P, Zhang W, Yu C, Liu S, Xu Y, Zhen S. Predicting chinese adolescent internet gaming addiction from peer context and normative beliefs about aggression: a 2-year longitudinal study. *Front Psychol.* 9:1143. doi: 10.3389/fpsyg.2018.01143
- Zuo B, Ma H. A research on the present situation of adolescent online game addiction: based on the survey of ten provinces and cities. *J Central China Norm Univ.* (2010) 49:117–22. doi: 10.3969/j.issn.1000-2456.2010.04.018
- Jia Y, Way N, Ling G, Yoshikawa H, Chen X, Hughes D, et al. The influence of student perceptions of school climate on socio-emotional

Limitations

Several limitations should be noted regarding this study. First, the data were collected using self-report measures; thus, common method biases may have existed. Second, this study only adjusted for the covariates of adolescents' gender, age, parent-adolescent relationship, and impulsivity. Future research should consider other relevant control variables, such as family function and peer context. Third, as the generalization of our results from this small sample of Chinese adolescents was difficult, future research should attempt to recruit larger samples from wider cultural and/or geographical settings for the purpose of clarifying the relationships between the variables in this study.

ETHICS STATEMENT

Testing material and survey procedures were approved by the ethics in human research committee of School of Education, Guangzhou University, and School of Psychology, South China Normal University.

AUTHOR CONTRIBUTIONS

CY, WL, XL, and WZ designed the work. CY, QL, HL, and WZ collected the data. CY, QL, HL, WL, XL, and WZ analyzed the data results and drafted the manuscript. CY, QL, WZ, HL, KD, XX, XG, WL, and XL revised the manuscript.

FUNDING

This study was supported by Guangzhou University's 2017 Training Program for Young Top-notch Personnels (BJ201725), the National Natural Science Foundation of China (31600901 and 31800938), the 13th Five-Year Plan for the Development of Philosophy and Social Sciences of Guangzhou (2016GZGJ93; 2017GZQN40), the Youth Project of Social Sciences for the Universities Belonged to Guangzhou City (1201630586), the General Project of The Ministry of Education of Humanities and Social Science (18YJA190012), the Natural Science Foundation of Guangdong Province (2018A030313406), the Superiority and Characteristic Subject Group Subsidy Project of Modern Education and Jingchu Culture Research of Yangtze University (2018YSH07).

- and academic adjustment: a comparison of Chinese and American adolescents. *Child Dev.* (2009) 80:1514–30. doi: 10.1111/j.1467-8624.2009.01348.x
10. Ma N, Zhang W, Yu C, Zhu J, Jiang Y, Wu T. Perceived school climate and Internet gaming disorder in junior school students: a moderated mediation model. *Chin J Clin Psychol.* (2017) 25:65–9. doi: 10.16128/j.cnki.1005-3611.2017.01.015
 11. Rehbein F, Baier D. Family-, media-, and school-related risk factors of video game addiction: a 5-year longitudinal study. *J Media Psychol.* (2013) 25:118–28. doi: 10.1027/1864-1105/a000093
 12. Cohen J, McCabe EM, Michelli NM, Pickeral T. School climate: research, policy, practice, and teacher education. *Teach Coll Rec.* (2009) 111:180–213.
 13. Eccles JS, Midgley C, Wigfield A, Buchanan CM, Reuman D, Flanagan C, et al. Development during adolescence: the impact of stage-environment fit on young adolescents' experiences in schools and in families. *Am Psychol.* (1993) 48:90–101. doi: 10.1037/0003-066X.48.2.90
 14. Eccles JS, Midgley C. Stage-environment fit: developmentally appropriate classrooms for young adolescents. In: Ames RE, Ames C, editors. *Research on Motivation in Education*, Vol. 3. San Diego, CA: Academic Press (1989). pp. 139–186.
 15. Kaplan H. Teachers' autonomy support, autonomy suppression and conditional negative regard as predictors of optimal learning experience among high-achieving bedouin students. *Soc Psychol Educ.* (2018) 21:1–33. doi: 10.1007/s12118-017-9405-y
 16. Yu C, Li X, Wang S, Zhang W. Teacher autonomy support reduces adolescent anxiety and depression: an 18-month longitudinal study. *J Adolesc.* (2016) 49:115–23. doi: 10.1016/j.adolescence.2016.03.001
 17. Aldridge JM, Mcchesney K. The relationships between school climate and adolescent mental health and wellbeing: a systematic literature review. *Int J Educ Res.* (2018) 88:121–45. doi: 10.1016/j.ijer.2018.01.012
 18. Bao Z, Li D, Zhang W, Wang Y. School climate and delinquency among Chinese adolescents: analyses of effortful control as a moderator and deviant peer affiliation as a mediator. *J Abnorm Child Psychol.* (2015) 43:81–93. doi: 10.1007/s10802-014-9903-8
 19. Yu CF, Li X, Zhang W. Predicting adolescent problematic online game use from teacher autonomy support, basic psychological needs satisfaction and school engagement: a two-year longitudinal study. *Cyberpsychol Behav Soc Netw.* (2015) 18:228–33. doi: 10.1089/cyber.2014.0385
 20. Cacioppo JT, Patrick W. *Loneliness: Human Nature and the Need for Social Connection*. New York, NY: W. W. Norton & Company (2008).
 21. Connell JP, Wellborn JG. Competence, autonomy and relatedness: a motivational analysis of self-system processes. In: Gunnar M, Sroufe LA, editors. *Minnesota Symposium on Child Psychology: Vol. 23. Self Processes in Development*. Chicago, IL: University of Chicago Press (1991). pp. 43–77.
 22. Weiss R. *Loneliness: The Experience of Emotional and Social Isolation*. Cambridge: MIT Press (1973).
 23. Benner AD. Latino adolescents' loneliness, academic performance and the buffering nature of friendships. *J Youth Adolesc.* (2011) 40:556–67. doi: 10.1007/s10964-010-9561-2
 24. Liu X, Zhu X, Dai Z. The relations of understanding social support, loneliness and internet addiction disorder in vocational college students. *Chin J Clin Psychol.* (2014) 22:679–82. doi: 10.13342/j.cnki.cjhp.2014.05.017
 25. Yu L. School climate, loneliness, and emotional and behavioral problem among left behind children. *Chin J Sch Health.* (2017) 38:942–5. doi: 10.16835/j.cnki.1000-9817.2017.06.047
 26. Caplan SE, Williams D, Yee N. Pathological internet use and psychosocial well-being among MMO players. *Comput Hum Behav.* (2009) 25:1312–9. doi: 10.1016/j.chb.2009.06.006
 27. Qin H, Rao P, Zhong H. A study on factors of leading to online game addiction. *Chin J Clin Psychol.* (2007) 15:155–6. doi: 10.3969/j.issn.1005-3611.2007.02.014
 28. Bronfenbrenner U. Toward an experimental ecology of human development. *Am Psychol.* (1977) 32:513–31. doi: 10.1037/0003-066X.32.7.513
 29. Dai W, Zhang W, Li D, Yu C, Wen C. Relationship between stressful life events and problem behaviors in adolescents: effects of gratitude and intentional self-regulation. *Chin J Clin Psychol.* (2010) 18:796–801. doi: 10.16128/j.cnki.1005-3611.2010.06.035
 30. Liu YL, Chang HT. The role of effortful control in the relationships among parental control, intentional self-regulation, and adolescent obedience. *J Child Fam Stud.* (2016) 25:2435–46. doi: 10.1007/s10826-016-0405-x
 31. Urban JB, Lewin-Bizan S, Lerner RM. The role of intentional self regulation, lower neighborhood ecological assets, and activity involvement in youth developmental outcomes. *J Youth Adolesc.* (2010) 39:783–800. doi: 10.1007/s10964-010-9549-y
 32. Gestsdóttir S, Lerner RM. Intentional self-regulation and positive youth development in early adolescence: findings from the 4-H study of positive youth development. *Dev Psychol.* (2007) 43:508–21. doi: 10.1037/0012-1649.43.2.508
 33. Wang GX, Gai XS. Intentional self-regulation in adolescence. *Adv Psychol Sci.* (2011) 19:1158–65. doi: 10.3724/SP.J.1042.2011.01158
 34. Wang H, Zhou X, Lu C, Wu J, Deng X, Hong L. Problematic internet use in high school students in Guangdong province, China. *PLoS ONE.* (2011) 6:e19660. doi: 10.1371/journal.pone.0019660
 35. Luthar SS, Crossman EJ, Small PJ. Resilience and adversity. In: Lerner RM, Lamb ME, editors. *Socioemotional Processes: 3. Handbook of Child Psychology and Developmental Science*, 7th ed. New York, NY: Wiley (2015). pp. 247–86. doi: 10.1002/9781118963418.childpsy307
 36. Zheng Y, Zhang W, Li S. School climate and school adjustment among junior school students: the mediating role of intentional self-regulation. *Educ Meas Eval.* (2015) 8:47–52. doi: 10.16518/j.cnki.emae.2015.04.010
 37. Russell D, Peplau LA, Cutrona CE. The revised UCLA Loneliness Scale: concurrent and discriminant validity evidence. *J Pers Soc Psychol.* (1980) 39:472–80. doi: 10.1037/0022-3514.39.3.472
 38. Tian Y, Yu C, Lin S, Lu J, Liu Y, Zhang W. Sensation seeking, deviant peer affiliation, and Internet gaming addiction among Chinese adolescents: the moderating effect of parental knowledge. *Front Psychol.* 9:2727. doi: 10.3389/fpsyg.2018.02727
 39. Zhou S, Yu C, Xu Q, Wei C, Lin Z. Peer victimization and problematic online game use among Chinese adolescents: a moderated mediation model. *Educ Meas Eval.* (2014) 7:43–8. doi: 10.3969/j.issn.1674-1536.2014.10.009
 40. Gentile D. Pathological video-game use among youth ages 8 to 18: a national study. *Psychol Sci.* (2009) 20:594–602. doi: 10.1111/j.1467-9280.2009.02340.x
 41. Hyun GJ, Han DH, Lee YS, Kang KD, Yoo SK, Chung US, et al. Risk factors associated with online game addiction: a hierarchical model. *Comput Hum Behav.* (2015) 48:706–13. doi: 10.1016/j.chb.2015.02.008
 42. Lee CS, Mckenzie K. Socioeconomic and geographic inequalities of internet addiction in Korean adolescents. *Psychiatry Investig.* (2015) 12:559–62. doi: 10.4306/pi.2015.12.4.559
 43. Zhu J, Zhang W, Yu C, Bao Z. Early adolescent internet game addiction in context: how parents, school, and peers impact youth. *Comput Hum Behav.* (2015) 50:159–68. doi: 10.1016/j.chb.2015.03.079
 44. Cyders MA, Littlefield AK, Coffey S, Karyadi KA. Examination of a short english version of the upps-p impulsive behavior scale. *Addict Behav.* (2014) 39:1372–6. doi: 10.1016/j.addbeh.2014.02.013
 45. Muthén LK, Muthén BO. *Mplus User's Guide*. Los Angeles, CA: Muthén and Muthén (1998–2012).
 46. Song G, Kong F, Liu M, Yuan X. The mediating effect of college student's loneliness between social support and internet addiction tendency. *Chin J Clin Psychol.* (2010) 18:331–3. doi: 10.16128/j.cnki.1005-3611.2010.03.030
 47. Zhang J, Liu Q, Deng L, Fang X, Liu Z, Lan J. Parents-adolescents relations and adolescent's Internet addiction: the mediaton effect of loneliness. *Psychol Dev Educ.* (2011) 27:641–7. doi: 10.16187/j.cnki.issn1001-4918.2011.06.003
 48. Ryan RM, Deci EL. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *Am Psychol.* (2000) 55:68–78. doi: 10.1037/0003-066X.55.1.68
 49. Taylor J, Taylor J. A content analysis of interviews with players of massively multiplayer online role-play games (MMORPGs):

- motivating factors and the impact on relationships. In: *International Conference on Online Communities and Social Computing*. Berlin: Springer (2009). pp. 613–21. doi: 10.1007/978-3-642-02774-1_66
50. Lin S, Yang L, Chen J, Wei C. School climate, intentional self-regulation and adolescent smoking behavior: the mediating effect of deviant peer affiliation. *Educ Meas Eval*. (2018) 11:57–64. doi: 10.16518/j.cnki.ema.2018.05.010
 51. Yuan P. *Study on the Internal and External Influence Factors on Interaction Between Parental Corporal Punishment and Internet Gaming Addiction in Adolescents*. Master dissertation, Urumqi: Xinjiang Normal University (2017).

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Yu, Li, Liang, Liu, Zhang, Lu, Dou, Xie and Gan. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



Hospitalized Children: Anxiety, Coping Strategies, and Pretend Play

Elisa Delvecchio¹, Silvia Salcuni², Adriana Lis², Alessandro Germani¹ and Daniela Di Riso^{2*}

¹ Dipartimento di Filosofia, Scienze Sociali, Umane e della Formazione, Università di Perugia, Perugia, Italy; ² DPSS – Dipartimento di Psicologia dello Sviluppo e della Socializzazione, Università di Padova, Padova, Italy

OPEN ACCESS

Edited by:

Marie Leiner,
Paul L. Foster School of Medicine,
Texas Tech University Health Sciences
Center, United States

Reviewed by:

Prashanth GP,
Oman Medical College, Oman
Bert Johansson,
Texas Tech University Health Sciences
Center, United States

*Correspondence:

Daniela Di Riso
daniela.diriso@unipd.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 11 February 2019

Accepted: 20 August 2019

Published: 06 September 2019

Citation:

Delvecchio E, Salcuni S, Lis A,
Germani A and Di Riso D (2019)
Hospitalized Children: Anxiety, Coping
Strategies, and Pretend Play.
Front. Public Health 7:250.
doi: 10.3389/fpubh.2019.00250

The aim of this paper was to assess strengths and fragilities in children aged 6 to 10 who suffered one or more hospitalizations. State and trait anxiety, coping abilities, and cognitive and affective functioning through play were assessed using a triangulation approach. Fifty hospitalized children aged 6–10 were compared to 50 non-hospitalized children, and children at first admission were compared with children with more than one hospitalization experience. The State-Trait Anxiety Scales Inventory for Children was administered for assessing trait and state anxiety, and the Children's Coping Strategies Checklist (Revision 1) was administered to assess coping dimensions. The Affect in Play Scale - Preschool - Brief (Extended version) was used to assess cognitive and affective dimensions of play. No significant differences were found for trait anxiety between hospitalized vs. non-hospitalized children. Instead, as expected, state anxiety was significantly higher in hospitalized children than in the non-hospitalized children. Hospitalized children reported higher scores than non-hospitalized children in support-seeking strategies. As for pretend play, hospitalized children showed significantly higher cognitive scores than non-hospitalized children. However, hospitalized children appeared significantly more restricted in their affect expressions. No significant differences were found for play and anxiety scores between children admitted for the first time in the hospital ward and children with more than one admission. However, children at first admission scored higher in coping and positive cognitive restructuring and in avoidance-coping strategies than children with more than one admission. The initial assessment of the interplay of key variables such as anxiety, coping and play can inform healthcare professionals by serving as a guide in order to determine a child's risk for negative psychological outcomes due to hospitalization, to plan appropriate interventions and to provide substantial assistance to hospitalized children in the future.

Keywords: anxiety, coping, symbolic play, hospitalized child, assessment

INTRODUCTION

Hospitalization for children means leaving their home and their caregivers and siblings and an interruption of their daily activities and routines. Moreover, hospital wards are often associated with staying in a “cold and medical” setting, facing fear of medical examinations, pain, uncertainty, and loss of control and safeness [e.g., (1, 2)]. This is particularly true for elementary school children who are involved in mental, emotional, and social adjustment developmental tasks. Literature

about hospitalization during childhood underscores how, in the short term, extreme distress may compromise the completion of a required medical procedure, while in the long term it may lead to difficulties in future intakes that discourage the use of medical treatments (3–6). Moreover, anxiety-provoking experiences (such as hospitalizations) can affect children physical growth, personality, or emotional development (7). Burns-Nader and Hernandez-Reif (2) stressed that to determine children's needs in the medical setting, specialists have to carry out a psychological assessment in order to detect potential stress, anxiety, coping abilities, and play skills to provide age-appropriate interventions.

Usually, children feel anxious before encountering medical professionals, as well as experiencing a hospitalization (7). Empirical studies suggest that children express anxiety through regression in behaviors, aggression, lack of cooperation, withdrawal, and difficulty recovering from procedures (8, 9). Literature shows that children involved in psychological programs were more able to contain anxiety, showing lower levels of anxiety assessed before surgery, and reporting less postoperative anxiety (10). Previous studies supported the importance of specific clinical measures to assess children's anxiety in medical settings (11). Indications provided by tailored tools, might be helpful to support children in approaching medical situations with a sense of comfort, achievement, and control. Few empirical studies have been carried out on levels of trait and state anxiety in hospitalized children (12). Trait anxiety follows the child in everyday experiences including hospitalization and as such, if elevated, has to be recognized as a vulnerability for the child. State anxiety could originate from the hospital experience. The literature shows that among children aged 5–11, it vanishes from hospital admission to discharge (13). Trait vs. state anxiety is not often assessed, and subsequently undertreated (14). Trait anxiety plays an important role in the child's response to hospitalization (9, 15). The higher a child's trait anxiety, the higher his or her perception of hospitalization as a stressful experience will be and the less effective will be his or her ability to cope (15, 16).

Burns-Nader and Hernandez-Reif (2) suggested it is fundamental to foster effective coping to minimize anxiety in children experiencing a medical situation. Coping in children can be defined as a collection of conscious and purposeful efforts that are directed at the regulation of aspects of the self (emotion, cognition, behavior, and physiology) and the environment in contexts involving stress [e.g., (17–19)]. Adaptive coping strategies could fail under stressful conditions (20–22). Effective coping behaviors provide resilience to mitigate the likelihood of adverse outcomes and potentially enhance growth (23–26). Effective coping promotes adjustment to stressful life events, well-being, competence and resilience during childhood and adolescence (27). Blount et al. (28) highlighted the importance to consider coping a multidimensional construct. Specifically, Skinner et al. (21) suggested that five categories of coping are clearly crucial across ages and have been empirically supported in children and adolescents (17, 29–32): problem-solving, positive cognitive restructuring (active coping), support seeking, avoidance, and distraction. Research findings suggested that

psychological outcomes related to hospitalization are linked to children's coping styles (33). Avoidant coping is mainly used during the acute phase of health care or hospitalization, whereas active coping is prominent in the recovery phase (7). Avoidant coping strategies are characterized by restricted thoughts on an upcoming event, denial of worries, and disconnection from stressful stimuli. They seem to be less effective in reducing the stress connected to hospitalization (12). With regard to the link between previous hospitalization and anxiety/coping, conclusions are not well-established. Some research has found that previous hospitalization is not related to a child's anxiety or coping (12, 34). However, children with no previous hospitalization, as well as those with fewer previous surgeries, showed higher anxiety than the ones who were already familiar with the medical setting (13, 35).

Among others, play is considered a coping method for children who experience a hospitalization, because play activity allows to express and elaborate affects and to show problem-solving abilities (36, 37). Play allows children to convey their feelings and control stressful experience because through it children can recreate and transform their life events (2, 38, 39). In a study in which outcome measures were not assessed, hospitalized children stated that they used play to manage stressful experiences more frequently than non-hospitalized children (2, 40). For such a purpose, symbolic play, or pretend play, represents an important integration opportunity of cognitive, affective, and interpersonal competencies. Play facilitates representation of the world and helps children to express their feelings, make choices, transform stories, use imagination, focus on stressful or unfamiliar themes, and develop skills (41–44). A growing amount of research has supported the validity and reliability of the Affect in Play Scale [APS, (43)], a measure to assess pretend play with children. Both the original and the brief version, which does not include video-recording, showed good psychometric properties in school and preschool-based samples of typically developing children in the United States and in Italy (45–52). The existing literature underlines the importance of providing children with play sessions in the hospital playroom, at the bedside, or even in waiting rooms of hospital wards (2). Li et al. (53) highlighted the role of play intervention in reducing distress and anxiety in children that are hospitalized. Although, O'Connor (54) indicated pretend play as a natural mediator with hospitalized children, there is a paucity of valid and reliable tools devoted to it (55). So, the assessment of cognitive and affective abilities in pretend play during hospitalization of children, should be seen as beneficial for researchers and clinicians (56, 57).

The aim of the current paper was to assess the strengths and fragilities of hospitalized children aged 6 to 10 who suffered one or more hospitalization, comparing them to a community sample of non-hospitalized children. More specifically, the purposes of the current paper were twofold: to compare the level of state and trait anxiety, coping, and pretend play in (a) hospitalized vs. non-hospitalized children and (b) children at first admission vs. children with more than one hospitalization experience. In order to accomplish these goals, state and trait anxiety, coping abilities, and cognitive and affective functioning through play

were assessed using a triangulation approach, which refers to the application and combination of several research methods in the study of the same phenomenon (58–60). In this study different information about the hospitalized children was collected using quantitative mixed methods (questionnaires and play tasks) gathered by the children themselves and compared with the same tools gathered by non-hospitalized children.

Attention was given to tools with adequate psychometric properties that can inform about a child's life by serving as a guide for initial assessments in pediatric wards where often a qualitative assessment is preferred. We hypothesized no significant differences in trait anxiety between hospitalized and non-hospitalized children, because it accompanies the child in everyday experience. Instead, state anxiety was expected to be higher.

MATERIALS AND METHODS

Procedure

The administration was carried out in compliance with the ethical standards for research outlined in the Ethical Principles of Psychologists and Code of Conduct (61). The study was approved by the ethics committee of the hospital including the pediatric unit and by the ethics committee for psychological research of Padova University (2017/num 2310). Each participant was met individually in a place where he or she could comfortably play and complete the questionnaires. During each session, participants were first engaged in the play task to assess cognitive and affective pretend play processes and later the two questionnaires were administered. No reward was offered for participation.

Participants

Power analysis to estimate the sample size was carried out using G*Power 3.1 (62). The sample size was inferred by considering three factors: a significance level of 0.05 (one tail); a medium effect size based on previous studies (53); and a power of 0.80. Power analysis indicated that there was an 80% chance of correctly rejecting the null hypothesis of no difference between hospitalized and non-hospitalized children, with a total sample of 100 (50 + 50) participants.

Thus, 50 hospitalized children (22 boys and 28 girls) aged 6–10 were recruited from a pediatric clinic in Northern Italy and 50 non-hospitalized children (22 boys and 28 girls) were recruited from elementary schools in Northern Italy.

Hospitalized Children

Participants were a convenient sample of children admitted at the Pediatric Clinic of the University of Padova, during a 13-month period. In this period, 50 pediatric patients met the criteria selected for the present research. Inclusion criteria included children diagnosed by a physician as affected by middle (e.g., rheumatologic, cardiac, and metabolic pathologies) or transient pathologies (e.g., appendicitis or tonsillitis) or both. Moreover, children with psychiatric symptoms, severe cognitive impairment, and maladjustment were excluded. This information was collected in an anamnestic form fulfilled by

parents, who signed written consent. Forty-two percent of selected children ($n = 21$) were at their first admission into the ward, and 58% ($n = 29$) had more than one admission to the hospital ward. Among the latter, 11% ($n = 5$) were admitted for different reasons, whereas 49% ($n = 24$) were admitted for the same reason. The admission period lasted between 5 and 10 days. Measures were administered in a quiet room, after a warm-up meeting with the examiner. The administration was scheduled in order not to interfere with the daily medical routine.

Non-hospitalized Children

Non-hospitalized children were selected randomly from a larger sample matched by gender and age with the hospitalized children. Children with psychiatric symptoms, severe cognitive impairment, and maladjustment were excluded. Consent forms were sent home to parents. Children were allowed to participate in the study after parents provided written consent. A brief questionnaire about the children's physical health was sent to parents for the assessment of possible hospitalization. Each participant was met individually during school hours in a room where the children could comfortably play and complete the questionnaires. Some familiarity with the examiner was established before task administration. During each session, participants were first engaged in the play task to assess cognitive and affective pretend play processes and later the two questionnaires were administered.

MEASURES

State-Trait Anxiety Inventory for Children [STAI-C; (63, 64)] is a self-report measure developmentally adequate for assessing anxiety symptoms in children aged 9–12 years, but it can be used with younger children with average or above average reading abilities. It includes two separate scales for measuring two anxiety concepts: state and trait anxiety. The state scale, a measure of transitory anxiety states, consists of 20 statements that ask children how they feel at a particular moment in time. The items all start with the stem “I feel” and next to each stem respondents have to choose among three responses the one that best describes their state (e.g., very calm, calm, or not calm). The trait scale consists of 20 statements that ask children how they generally feel. It measures relatively stable individual differences in anxiety proneness. The items are rated on a 3-point scale with responses: *hardly-ever*, *sometimes*, and *often*. STAI-C showed adequate psychometric features in both international and national samples [e.g., (65, 66)]. Cronbach's alpha for the state scale was 0.79 for hospitalized and 0.71 for non-hospitalized children; alphas for the trait scale were 0.77 and 0.76 for hospitalized and non-hospitalized children, respectively.

Children's Coping Strategies Checklist-Revision 1 [CCSC-R1; (67)] includes 54 statements. Each statement starts with “If I have a problem” and is followed, for example, by “I tell others how I would like to solve it.” Children have to indicate how frequently they usually adopted the coping strategies described in the item on a 4-point Likert scale: 1 = *never*, 2 = *sometimes*, 3 = *often*, and 4 = *always*. CCSC-R1 is composed of 13 subscales and five dimensions: problem focused, coping and positive cognitive

restructuring, distraction coping strategies, avoidance coping strategies, and support-seeking strategies. Examples of items are as follow: problem focused (“You thought about what you needed to know before”); coping and positive cognitive restructuring (“You told yourself you could handle whatever happens”); distraction coping strategies (“You watched TV”); avoidance coping strategies (“You tried to stay away from things that made you feel upset”); support-seeking strategies (“You talked to someone who could help you solve the problem”). Thus, CCSC-R1 includes two dimensions of active coping (problem-focused coping and positive cognitive restructuring), two dimensions connected with avoidance (distraction and avoidance coping strategies), and finally one dimension connected with support-seeking strategies. In this paper, each scale was made of the sum of the items. In the Italian validation, all dimensions yielded adequate reliability (68). Cronbach’s alphas for the current study ranged from 0.67 to 0.87 for hospitalized children and from 0.55 to 0.77 for non-hospitalized ones.

The extended version of the Affect in Play Scale-Preschool Brief Version [APS-P-BR; (43, 46–50)] is a structured individually administered 5 min play task that allows evaluation of the affective and cognitive aspects (affect, imagination, organization, and comfort) in child’s play using a standardized and empirically validated administration procedure and *in vivo* scoring attribution (43). Children are asked to play with a set of plastic and stuffed toys [for further detail see (49)]. Six primary scores (four cognitive and two affective) are assigned using a detailed scoring manual (43). The four cognitive scores are organization, elaboration, imagination, and comfort, coded on a 4-point Likert scale. Two main scores concerning affects are frequency of affect and tone [see (49)].

Psychometric characteristics of APS-P-BR Extended version showed satisfactory results (49).

DATA ANALYSIS

Student’s one-tailed *t*-tests for independent samples was performed on the APS-P-BR Extended version, state and trait STAI-C, and CCSC-R1 scores to compare hospitalized vs. non-hospitalized children. Moreover, a Student’s one-tailed *t*-test for independent samples on all variables was performed to compare means of children who were admitted in the hospital ward for the first time vs. children who were admitted more than one time. A one-tailed test was considered appropriate because the aim was to check if the estimated value may depart from the reference value in only one direction.

RESULTS

Means and standard deviations for all variables for hospitalized and non-hospitalized children are reported in **Table 1**.

Student’s *t*-test value for independent samples was calculated for all tools administered to compare hospitalized vs. non-hospitalized children. Results are shown in **Table 1**.

Regarding anxiety, as expected no significant differences were found for trait anxiety. However, hospitalized children showed a higher level of state anxiety with a medium effect size. Focusing on coping strategies, support-seeking strategies showed hospitalized children reporting higher scores than non-hospitalized ones, with medium effect size. In regards to distraction, hospitalized children reported lower distraction scores. No other differences were found concerning this measure.

TABLE 1 | Means, standard deviations and Student’s *t*-test for hospitalized and non-hospitalized children.

	Hospitalized (<i>n</i> = 50)		Non-hospitalized (<i>n</i> = 50)		<i>t</i> (98)	<i>p</i> *	<i>d</i>
	M	SD	M	SD			
Age	8.10	1.62	8.96	0.98			
STAI-C							
State	31.22	6.76	29.34	4.15	1.68	<0.050	0.33
Trait	36.98	6.44	35.98	6.19	0.79	0.215	0.16
CCSC-R1							
Problem focused	2.48	0.54	2.64	0.49	−1.53	0.064	0.31
Positive cognitive restructuring	2.54	0.57	2.51	0.45	0.34	0.367	0.06
Distraction	2.64	0.71	2.87	0.52	−1.85	<0.050	0.37
Avoidance	2.65	0.50	2.50	0.72	1.60	0.056	0.24
Support-seeking	2.50	0.72	2.15	0.54	2.79	<0.010	0.55
APS-P-BR							
Organization	3.36	0.85	3.18	0.83	1.07	0.143	0.21
Elaboration	3.24	0.87	2.48	0.81	4.51	<0.010	0.90
Imagination	3.42	0.76	2.96	0.70	3.15	<0.010	0.63
Comfort	3.28	0.86	3.14	0.88	0.81	0.211	0.16
Frequency of affect	3.52	0.74	3.94	0.24	−3.15	<0.010	0.76
Tone	2.74	0.83	2.96	0.40	−1.69	<0.050	0.34

*one-tailed.

As for pretend play, hospitalized children showed significantly higher elaboration and imagination than non-hospitalized children, with high and medium effect size, respectively. However, they appeared significantly more restricted in their affect expressions and with lower scores on tone, with high and medium effect size.

Means and standard deviations for children admitted for the first time in the hospital ward and children with more than one admission as well as Student's *t*-test for independent samples are reported in **Table 2**.

No significant differences were found for play and anxiety scores. For coping strategies, children at first admission scored higher in coping and positive cognitive restructuring and in avoidance-coping strategies than children with more than one admission. Effect sizes of these differences were medium.

DISCUSSION

This triangulation study evaluated state and trait anxiety, coping, and pretend play in a sample of hospitalized school-age Italian children compared with a control group of children of the same age never hospitalized. Trait anxiety did not differentiate significantly hospitalized vs. not hospitalized children, meaning that anxiety levels that typically accompany children during their everyday life experiences did not seem to be affected by the hospitalization. Trait anxiety did not differentiate significantly children at their first admission vs. children who already experienced hospitalization, meaning that the structural level of anxiety, so-called trait anxiety, was maintained at a normative level and was not undermined by the hospitalization experience (9, 15). As expected, state anxiety that was influenced by stressful transient experiences, such as the hospitalization, was higher

in hospitalized children, with no difference in one-admission or multiple-admission subgroups (53). Referring to coping, hospitalized children reported a higher level of support seeking but lower score on distraction. As expected, children in the hospital ward are looking for more support by parents, nurses, or volunteers, but they are forced to reduce distraction strategies, such as sport or watching TV. No significant differences were found between hospitalized and non-hospitalized children for the two dimensions of active coping—problem-focused and positive cognitive restructuring. Literature suggested that an increase in problem-solving strategies is typical of this stage of development (27), showing that school age children are involved in a gradual shift from behavioral actions to more cognitive-based coping (69, 70). This pattern seemed to be valid independently from hospitalization experience. However, when looking at the two subsamples of hospitalized children, positive cognitive structuring and avoidance appeared significantly higher for children in their first admission. As Wilcox (33) suggested, the effectiveness of coping strategies are affected by recurrence and length of admissions. Children with more than one hospitalization are less prone in avoiding the stress of the situation and in recalling positive thoughts. Despite the unpleasant experience of hospitalization, hospitalized children in this study were able to maintain an organized pretend play and appeared comfortable in play at the same level as non-hospitalized children. Moreover, they used a higher amount of variety and complexity of embellishment in the story themes (elaboration) and a higher amount of fantasy and number of transformations (e.g., using one thing as another) in the play (imagination). Their more sophisticated elaboration of the scenario and the more prominent use of transformation in their storytelling might represent a useful way to deal with the

TABLE 2 | Student's *t* for hospitalized children with one or more admissions.

	First admission (<i>n</i> = 21)		More than one (<i>n</i> = 29)		<i>t</i> ₍₄₈₎	<i>p</i> [*]	<i>d</i>
	M	SD	M	SD			
STAI-C							
State	31.62	7.18	30.93	6.56	0.35	0.363	0.10
Trait	35.91	6.12	37.76	6.67	−1.00	0.160	0.29
CCSC-R1							
Problem focused	2.59	0.69	2.40	0.40	1.21	0.115	0.37
Positive cognitive restructuring	2.75	0.50	2.39	0.57	2.29	<0.050	0.67
Distraction	2.69	0.54	2.60	0.82	0.46	0.323	0.13
Avoidance	2.81	0.52	2.53	0.47	1.96	<0.050	0.56
Support-seeking	2.55	0.77	2.47	0.70	0.41	0.343	0.11
APS-P-BR							
Organization	3.33	0.86	3.38	0.86	−0.19	0.426	0.06
Elaboration	3.19	0.86	3.28	0.88	−0.34	0.368	0.10
Imagination	3.33	0.80	3.48	0.74	−0.68	0.248	0.19
Comfort	3.29	0.78	3.28	0.92	0.04	0.484	0.01
Frequency of affect	3.48	0.68	3.55	0.78	−0.36	0.362	0.09
Tone	2.90	0.94	2.62	0.73	1.20	0.117	0.33

*one-tailed.

distressing, unfamiliar, and painful reality of the hospitalization experience [e.g., (54)]. However, hospitalized children were more restricted in their expressions of affections in play, maybe for fear of being overwhelmed by a great variety and amount of affects that hospitalization could activate. It is interesting that the trend was maintained both for children at first hospitalization as well as for children with more than one hospitalization. Repeated hospitalizations do not seem to influence cognitive or affective components of play. Altogether, in this study the results showed that hospitalized children were able to organize a pretend play and trait anxiety did not differ from not clinical children. Moreover, they expressed active coping, but they also try to use avoidance defenses and they recognized their need for support.

However, this research has several limitations. This study was exploratory in nature. First, the sample was small and was made up of children affected by different kinds of diseases. Moreover, the generalizability of the results might be biased by the sampling method used for the collection of hospitalized children. Even though the sample size was supported by the power analysis, the number of participants was also affected by the recruitment in a hospital ward and by the restricted time schedule of the agreement with the hospital itself. Research and clinical literature showed the use of play in hospital, but often introduced and interpreted in a qualitative way: the use of the APS-P-BR Extended version would give the experts a way to assess in a more empirical way how the hospitalized children would be able to organize or not a pretend play in a distressful period of their lives.

There is a paucity of research on quantitative assessment with a triangulation method, mostly used to combine qualitative and quantitative approaches. The present paper aimed to propose the use of three validated measures to highlight children functioning in the experience of hospitalization. Even though anxiety, coping, and play are singular important aspects, their interplay might shed more light on the way children face a stressful experience, capturing the different dimensions of the same phenomenon. Referring to Lewick (7), beginning a health care assessment as it was proposed in this study stressing children's resources and liabilities means to recognize and support patients' resilience, or strengths, and contributes in understanding the way in which a child patient can manage struggles in his or her life. In this way, a medical professional helps the patient to focus on

and bring out his or her internal resources in order to deal with and overcome his or her concerns about the medical problems. Both strengths and difficulties should be relevant for—and emphasized by—medical professionals. In addition, starting from the resources and reframing negative talk around the child, a health care provider can decrease a child's anxiety and maladaptive trauma responses, regardless of the specific reasons for medical treatment. At last, the advice given to medical professionals to speak aloud a child's positive qualities during the first assessment (as well as whenever possible) is of crucial importance because it may be the only time in a day a child hears about them.

DATA AVAILABILITY

The datasets for this manuscript are not publicly available because Data available upon request. Requests to access the datasets should be directed to elisa.delvecchio@unipg.it.

ETHICS STATEMENT

This study was carried out in accordance with the recommendations of the Ethical Principles of Psychologists and Code of Conduct (61) with written informed consent from all subjects. All subjects gave written informed consent in accordance with the Declaration of Helsinki. The protocol was approved by the Ethic committee of the hospital including the pediatric unit and by the Ethic committee for psychological research of Padova University (#2310).

AUTHOR CONTRIBUTIONS

AL, DD, ED, and SS contributed conception and design of the study. AG organized the database and performed the statistical analysis. AL wrote the first draft of the manuscript. DD, ED, and SS wrote sections of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

ACKNOWLEDGMENTS

Many thanks to the hospital professionals and staff, to the children and their families, and to Dr. C. Alberti, who collaborated for data collection.

REFERENCES

- Koukourikos K, Tzehe L, Pantelidou P, Tsaloglidou A. The importance of play during hospitalization of children. *Mater Sociomed.* (2015) 27:438–41. doi: 10.5455/msm.2015.27.438-441
- Burns-Nader S, Hernandez-Reif M. Facilitating play for hospitalized children through child life services. *Children's Health Care.* (2016) 45:1–21. doi: 10.1080/02739615.2014.948161
- Du S, Jaaniste T, Champion GD, Yap CS. Theories of fear acquisition: the development of needle phobia in children. *Ped Pain Letter-Comm.* (2008) 10:13–7. Retrieved from: http://childpain.org/ppl/issues/v10n2_2008/v10n2_yap.pdf
- Kennedy RM, Luhmann J, Zempsky WT. Clinical implications of unmanaged needle-insertion pain and distress in children. *Pediatrics.* (2008) 122 (Suppl 3):S130–3. doi: 10.1542/peds.2008-1055e
- Noel M, McMurtry CM, Chambers CT, McGrath PJ. Children's memory for painful procedures: The relationship of pain intensity, anxiety, and adult behaviors to subsequent recall. *J Ped Psych.* (2010) 35:626–36. doi: 10.1093/jpepsy/jsp096
- Ersig AL, Kleiber C, McCarty AM, Hanrahan K. Validation of a clinically useful measure of children's state anxiety before medical procedures. *J Spec Ped Nurs.* (2013) 18:311–9. doi: 10.1111/jspn.12042
- Lerwick JL. Minimizing pediatric healthcare-induced anxiety and trauma. *World J Clin Pediatr.* (2016) 8 5:143–50. doi: 10.5409/wjcp.v5.i2.143

8. Favara-Scacco C, Smirne G, Schiliro G, Di Cataldo A. Art therapy as support for children with leukemia during painful procedures. *Med and Ped Oncol.* (2001) 36:474–80. doi: 10.1002/mpo.1112
9. Hart D, Bossert E. Self-reported fears of hospitalized school-aged children. *J Ped Nurs.* (1994) 9:83–90.
10. Yun-ping L, Zhen-hua H, Finley GA, Yun-xia Z. Effects of the combination of mask preconditioning with idazolam pretreatment on anxiety and mask acceptance during pediatric inhalational induction and postoperative. *Chin Med J.* (2012) 125:1908–14. doi: 10.3760/cma.j.issn.0366-6999.2012.11.013
11. Stephens BK, Barkey ME, Hall HR. Techniques to comfort children during stressful procedures. *Accid. Emerg. Nurs.* (1999) 7:226–36. doi: 10.1016/S0965-2302(99)80055-1
12. Koller, D. (2008). *Child Life Council Evidence-Based Practice Statement: Therapeutic Play in Pediatric Health Care: The Essence of Child Life Practice*. Retrieved from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.517.4281&rep=rep1&type=pdf> (accessed August 20, 2019).
13. Tiedeman ME, Clatworthy S. Anxiety responses of 5- to 11-year-old children during and after hospitalization. *J Ped Nurs.* (1990) 5:334–43.
14. Crandall MRN, Lammers C, Senders C, Savedra M, Braun JV. Initial validation of a numeric zero to ten scale to measure children's state anxiety. *Anes Analg.* (2007) 105:1250–3. doi: 10.1213/01.ane.0000284700.59088.8b
15. Bossert E. Factors influencing the coping of hospitalized school-age children. *J Ped Nurs.* (1994) 9:299–306.
16. Bossert E. Stress appraisals of hospitalized school-age children. *Children's Health Care.* (1994) 23:33–49. doi: 10.1207/s15326888chc2301_3
17. Compas BE, Connor-Smith JK, Saltzman H, Thomsen AH, Wadsworth ME. Coping with stress during childhood and adolescence: Problems, progress, and potential in theory and research. *Psych Bull.* (2001) 127:87–127. doi: 10.1037/0033-2909.127.1.87
18. Eisenberg N, Fabes RA, Guthrie IK. Coping with stress: the roles of regulation and development. In: Wolchik SA, Sandler I, editors. *Handbook of Children's Coping: Linking Theory and Intervention*. New York, NY: Plenum (1997). doi: 10.1007/978-1-4757-2677-0_2
19. Skinner E, Edge K. Reflections on coping and development across the lifespan. *Intern J Behav Dev.* (1998) 22:357–66. doi: 10.1080/016502598384414
20. Skinner EA, Wellborn JG. Coping during childhood and adolescence: a motivational perspective. In: Featherman DL, Lerner RM, Perlmutter M, editors. *Life-Span Development and Behavior. Life-Span Development and Behavior*. Vol. 12 (Hillsdale, NJ: Lawrence Erlbaum. (1994). p. 91–133. doi: 10.4324/9781315789255-3
21. Skinner EA, Edge K, Altman J, Sherwood H. Searching for the structure of coping: A review and critique of category systems for classifying ways of coping. *Psych Bull.* (2003) 129:216–69. doi: 10.1037/0033-2909.129.2.216
22. Skinner EA, Zimmer-Gembeck MJ. The development of coping. *Ann Rev Psych.* (2007) 58:119–44. doi: 10.1146/annurev.psych.58.110405.085705
23. Blount RL, Bunke VL, Zaff JF. Bridging the gap between explicative and treatment research: a model and practical implications. *J Clin Psych in Med Sett.* (2000) 7:79–90. doi: 10.1023/A:1009501604652
24. Carrey N, Ungar M. Resilience theory and the diagnostic and statistical manual: incompatible bed fellows? *Child Adol Psych Clin of North Am.* (2007) 16:497–513. doi: 10.1016/j.chc.2006.12.007
25. Kazdin AE, Holland L, Crowley M. Family experience of barriers to treatment and premature termination from child therapy. *J Cons Clin Psych.* (1997) 65:453–63. doi: 10.1037/0022-006X.65.3.453
26. Blount RL, Bunke VL, Zaff JF. The integration of basic research, treatment research, and clinical practice in pediatric psychology. In: Drotar D, editors. *Handbook of Research in Pediatric and Child Clinical Psychology: Practical Strategies and Methods*. New York, NY: Kluwer Academic/Plenum Publishers. (2000). p. 491–510. doi: 10.1007/978-1-4615-4165-3_23
27. Zimmer-Gembeck MJ, Skinner EA. Review: the development of coping across childhood and adolescence: an integrative review and critique of research. *Inter J Beh Dev.* (2011) 35:1–17. doi: 10.1177/0165025410384923
28. Blount RL, Simons LE, Devine KA, Jaaniste T, Cohen LL, Chambers CT, et al. Evidence-based assessment of coping and stress in pediatric psychology. *J Ped Psych.* (2008) 33:1021–45. doi: 10.1093/jpepsy/jsm071
29. Ayers TS, Sandler IN, West SG, Roosa MW. A dispositional and situational assessment of children's coping: testing alternative models of coping. *J Pers.* (1996) 64:923–58. doi: 10.1111/j.1467-6494.1996.tb010949.x
30. Connor-Smith JK, Compas BE, Wadsworth ME, Thomsen AH, Saltzman H. Responses to stress in adolescence: Measurement of coping and involuntary responses to stress. *J Cons Clin Psych.* (2000) 68:976–92. doi: 10.1037/0022-006X.68.6.976
31. Tobin DL, Holroyd KA, Reynolds RV, Wigal JK. The hierarchical factor structure of the coping strategies inventory. *Cogn Ther Res.* (1989) 13:343–61. doi: 10.1007/BF01173478
32. Walker LS, Smith CA, Garber J, Van Slyke DA. Development and validation of the pain response inventory for children. *Psych Assess.* (1997) 9:392–405. doi: 10.1037/1040-3590.9.4.392
33. Wilcox LN. *Exploring Coping Skills of Hospitalized Children: A Children's Book Proposal*. (2018). Retrieved from: <https://pdfs.semanticscholar.org/e3a4/d3b7d6d96564d496305aac9d09ea62440c59.pdf> (accessed August 20, 2019).
34. Thompson LM. Information-seeking coping and anxiety in school-age children anticipating surgery. *Children's Health Care.* (1994) 23:87–97. doi: 10.1207/s15326888chc2302_2
35. Wells RD, Schwebel AI. Chronically ill children and their mothers: Predictors of resilience and vulnerability to hospitalization and surgical stress. *Devel Behav Ped.* (1987) 8:83–9. doi: 10.1097/00004703-198704000-00004
36. Sutton-Smith B. *The Ambiguity of Play*. Boston, MA: Harvard University Press (2009).
37. Bjorklund DF, Green BL. The adaptive nature of cognitive immaturity. *Am Psych.* 47:46. doi: 10.1037//0003-066X.47.1.46
38. Moore ER, Bennett KL, Dietrich MS, Wells N. The effect of directed medical play on young children's pain and distress during burn wound care. *J Ped Health Care.* (2015) 29:265–73. doi: 10.1016/j.pedhc.2014.12.006
39. Nabors L, Bartz J, Kichler J, Sievers R, Elkins R, Pangallo J. Play as a mechanism for working through medical trauma for children with medical illnesses and their siblings. *Issues Compr Ped Nurs.* (2013) 36:212–24. doi: 10.3109/01460862.2013.812692
40. Salmela M, Salanterä S, Ruotsalainen T, Aronen E. Coping strategies for hospital-related fears in pre-school-aged children. *J Ped Child Health.* (2010) 46:108–14. doi: 10.1111/j.1440-1754.2009.01647.x
41. Vygotsky LS. Play and its role in the mental development of the child. *Sov Psych.* (1967) 5:6–18. doi: 10.2753/RPO1061-040505036
42. Bergen D. Psychological approaches to the study of play. *Am J Play.* (2015) 8:101–28.
43. Russ SW. *Play in Child Development and Psychotherapy: Toward Empirically Supported Practice*. Mahwah, NJ: Lawrence Erlbaum (2004).
44. Singer DG, Golinkoff RM, Hirsh-Pasek K. *Play: How Play Motivates and Enhances Children's Cognitive and Social-Emotional Growth*. New York, NY: Oxford University Press (2006).
45. Cordiano TJ, Russ SW, Short EJ. Development and validation of the affect in play scale-brief rating version (APS-BR). *J Pers Ass.* (2008) 90:52–60. doi: 10.1080/00223890701693744
46. Delvecchio E, Di Riso D, Li J-B, Lis A, Mazzeschi C. Affect in play scale preschool-version: validation on a sample of school age Italian children. *J Child Fam Stud.* (2016) 25:3523–36. doi: 10.1007/s10826-016-0504-8
47. Delvecchio E, Mabilia D, Li J, Di Riso D. Pretend play in Italian children: validation of the affect in play scale-preschool version. *J Child Fam Stud.* (2016) 25:86–95. doi: 10.1007/s10826-015-0208-5
48. Delvecchio E, Li JB, Pazzagli C, Lis A, Mazzeschi C. How do you play? a comparison among children aged 4–10. *Front Psych.* (2016) 17:1833. doi: 10.3389/fpsyg.2016.01833
49. Di Riso D, Salcuni S, Lis A, Delvecchio E. From research to clinical settings: validation of the affect in play scale – preschool brief version in a sample of preschool and school aged Italian children. *Front Psych.* (2017) 12:728. doi: 10.3389/fpsyg.2017.00728
50. Fehr K, Russ SW. Assessment of pretend play in preschool-aged children: validation and factor analysis of the affect in play scale-preschool versions. *J Pers Ass.* (2014) 96:350–7. doi: 10.1080/00223891.2013.838171
51. Kaugars AS. Assessment of pretend play. In: Russ SW and Niec LN, editors. *Play in Clinical Practice: Evidence Based Approaches*. New York, NY: Guilford (2011). p. 51–82.

52. Kaugars AS, Russ SW. Assessing preschool children's pretend play: preliminary validation of the affect in play scale—preschool version. *Early Educ De.* (2009) 20:733–55. doi: 10.1080/10409280802545388
53. Li WHC, Chung JOK, Ho KY, Kwok BMC. Play interventions to reduce anxiety and negative emotions in hospitalized children. *BMC Pediatr.* (2016) 11:16–36. doi: 10.1186/s12887-016-0570-5
54. O'Connor K. Addressing diversity issues in play therapy. *Profess Psych: Res Prac.* (2005) 36:566–73. doi: 10.1037/0735-7028.36.5.566
55. Moore M, Russ SW. Pretend play as a resource for children: Implications for pediatricians and health professionals. *J Dev Behav Pediatr.* (2006) 27:237–48. doi: 10.1097/00004703-200606000-00011
56. Kazdin AE. Evidence-based assessment for children and adolescents: Issues in measurement development and clinical applications. *J Clin Child Adol Psych.* (2005) 34:548–58. doi: 10.1207/s15374424jccp3403_10
57. Mash EJ, Hunsley J. Evidence-based assessment of child and adolescent disorders: issues and challenges. *J Clin Child Adol Psych.* (2005) 34:362–79. doi: 10.1207/s15374424jccp3403_1
58. Altrichter H, Feldman A, Posch P, Somekh B. *Teachers Investigate Their Work: An Introduction to Action Research Across the Professions, 2nd ed.* London and New York, NY: Routledge (2008).
59. Bogdan R, Biklen SK. *Qualitative Research for Education: An Introduction to Theories and Methods.* Needham, MA: Allyn and Bacon (2006).
60. Cohen L, Manion L. *Research Methods in Education, 5th ed.* London and New-York, NY: Routledge (2000).
61. American Psychological Association. *Publication Manual of the American Psychological Association, 6th ed.* Washington, DC: American Psychological Association (2010).
62. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behav Res Meth.* (2009) 41:1149–60. doi: 10.3758/BRM.41.4.1149
63. Spielberger CD, Gorsuch RL, Lushene RE. *Manual for the State-Trait Anxiety Inventory (Self-Evaluation Questionnaire).* Palo Alto, CA: Consulting Psychologists Press (1970).
64. Spielberger CD, Edwards CD, Lushene RE, Montuori J, Platzek D. *State-Trait Anxiety Inventory for Children – STAIC: Professional manual.* Redwood City, CA: Mind Garden, Inc (1973).
65. Almerigogna J. Vérification de la structure factorielle d'une traduction française de l'Inventaire de l'Anxiété État-Trait pour Enfants. [Verifying the factorial structure of a French translation of the State-Trait Anxiety Inventory for Children]. *Ann Méd Psychol.* (2011) 169:345–47. doi: 10.1016/j.amp.2010.01.009
66. Delvecchio E, Cavallina C, Di Riso D, Mazzeschi C. Early evidence of the Italian validation of the trait anxiety scale of the state-trait anxiety inventory for children. *Eur J of Dev Psych.* (2017) 15:214–23. doi: 10.1080/17405629.2017.1297227
67. Ayers TS, Sandler IN. *Manual for the Children's Coping Strategies Checklist & How I Coped Under Pressure Scale.* (1999). Retrieved from: <http://www.asu.edu/clas/asuprc/> (accessed June 10, 2006).
68. Camisasca E, Caravita SCS, Milani L, Di Blasio P. The Children's Coping Strategies Checklist-revision 1: A validation study in the Italian population. *TPM.* (2012) 19:197–218. doi: 10.4473/TPM19.3.4
69. Losoya S, Eisenberg N, Fabes RA. Developmental issues in the study of coping. *Intern J Behav Dev.* (1998) 22:287–313. doi: 10.1080/016502598384388
70. Spirito A. Child coping. In: Naar-King S, Ellis DA, Frey MA, editors. *Assessing Children's Well-Being: A Handbook of Measures.* London: Lawrence Erlbaum (2003). p. 115–31.

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Delvecchio, Salcuni, Lis, Germani and Di Riso. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



Parental Reflective Functioning in Mothers and Fathers of Children With ADHD: Issues Regarding Assessment and Implications for Intervention

Claudia Mazzeschi^{1*}, Livia Buratta¹, Alessandro Germani¹, Clarissa Cavallina¹, Roberta Ghignoni², Michele Margheriti³ and Chiara Pazzagli¹

¹ Department of Philosophy, Social Sciences and Education, University of Perugia, Perugia, Italy, ² Istituto Agazzi "Futurabile"—Outpatient Center of the Developmental Age, Arezzo, Italy, ³ Center for Clinical Neuropsychology of Developmental Age "Giorgio Sabbadini", Perugia, Italy

OPEN ACCESS

Edited by:

Raz Gross,
Sheba Medical Center, Israel

Reviewed by:

Andrew M. H. Siu,
Hong Kong Polytechnic University,
Hong Kong
Cihad Dunder,
Ondokuz Mayıs University, Turkey
Jennifer S. H. King,
National University
Hospital, Singapore

*Correspondence:

Claudia Mazzeschi
claudia.mazzeschi@unipg.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 15 February 2019

Accepted: 29 August 2019

Published: 13 September 2019

Citation:

Mazzeschi C, Buratta L, Germani A, Cavallina C, Ghignoni R, Margheriti M and Pazzagli C (2019) Parental Reflective Functioning in Mothers and Fathers of Children With ADHD: Issues Regarding Assessment and Implications for Intervention. *Front. Public Health* 7:263. doi: 10.3389/fpubh.2019.00263

Parental factors contribute to ADHD, partly in an etiological way and partly as moderators and mediators of child outcomes and treatment effects. An important aspect of parenting seems to be parental reflective functioning (PRF), defined as the parent's capacity to reflect upon his own and his child's internal mental experience. The studies on parenting factors linked to ADHD have not extensively investigated the role of PRF. Recent findings on interventions have begun to consider mentalization to promote empathy and emotion regulation in parents, but empirical studies assessing PRF are still scarce. The aim of this cross-sectional study was to compare specific familial and parental functioning characteristic between parents of children with attention deficit/hyperactivity disorder (ADHD) and parents of controls without ADHD. A clinical sample of 41 children with ADHD aged 8–11 years and their parents was compared with a matched, non-clinical sample of 40 children. Three aspects of parental functioning were investigated: parental symptomatology, parental alliances and PRF; children's differences in strength and difficulty profiles were also assessed. The results showed that families of children with ADHD had lower socioeconomic status, and both mothers and fathers of the same families reported higher scores for depression and lower PRF than did the control group; only mothers showed lower parental alliance. Logistic regression highlighted the fact that several of these familial and parental factors contributed to the increased risk of belonging to the clinical group, specifically both mothers' and fathers' depressive symptoms and lower PRF. These data represent new findings with potentially meaningful clinical implications for both assessment and intervention.

Keywords: ADHD, co-parenting, parents' symptomatology, parental reflective functioning, assessment

INTRODUCTION

Attention deficit/hyperactivity disorder (ADHD) is one of the most prevalent neurodevelopmental disorders and constitutes a common cause for referral to psychological and psychiatric services. Although inattention and hyperactivity/impulsivity are core symptoms defining the disorder (1), it is characterized by a wide variability of symptoms and difficulties in

functioning (2). Furthermore, it is known that impairments can be either alleviated or exacerbated by environmental factors (3). In fact, longitudinal studies have shown that ADHD expression is influenced by the complex interaction between genetic factors and environmental variables (4).

Because environmental factors can either alleviate or exacerbate the functional impairments caused by ADHD (3), studies have recently investigated the impact of specific parenting features on the expression and development of children's ADHD and on treatment effects (5–7).

In the last two decades, several studies have reported substantial differences in parental psychopathology and family functioning between families of children with ADHD and parents of no-ADHD controls (i.e., 6) (8). The effects are likely to be complex, and over time, both children and parents may be reinforced for maladaptive behaviors. On the one hand, the demanding, moody and uncooperative behavior described among children with ADHD can represent a parenting challenge and has an impact on parental behavior and adjustment. On the other hand, parenting characteristics and difficulties may exacerbate children's behavioral difficulties and the course of the disorder (9–12).

Studies on parental psychopathology characterizing families with ADHD have focused mainly on depressive disorders (13, 14). Recently, more attention has been paid to anxious-type symptoms (15, 16). Several studies have found that parents of children with ADHD report higher levels of depression and anxiety symptoms than do parents of children without ADHD (16, 17). Studies comparing mothers and fathers showed a greater presence of depression and anxiety symptoms in mothers than in fathers (18, 19). However, data are inconsistent because other studies did not find the same differences in psychopathology between parents of children with ADHD and parents of children in the control group, suggesting the need to further investigate this controversial issue (20). A recent meta-analysis showed that the research on these topics has largely focused on mothers, with fewer studies on fathers (21).

In regard to familial dimensions, Kaplan et al. (22) found that parents of children with ADHD reported more difficulties in family functioning. Families with ADHD are characterized by lower parental agreement or consistency regarding the management of their children (23) and higher levels of conflict in marital interactions [e.g., (23–25)]. Parents of children with ADHD are more discordant and conflictual than parents of controls, showing lower levels of parental alliance and more arguments about child-related and co-parenting issues (5, 26). However, few studies have focused on co-parenting alliances in families with ADHD.

In addition to studies on parents' psychopathological symptoms and parental alliances, research in the ADHD field has recently begun to empirically investigate the role of mentalization both in adults with ADHD and in parents of children with ADHD, as well as in some parenting interventions. Mentalization, operationalized as reflective functioning (RF), refers to the human capacity to understand behavior in light of underlying mental states and intentions. Impairments in this

capacity have been implicated in a wide variety of disorders and behavioral problems (27).

In adults with ADHD, it has been at first assumed that RF impairments could be an important process underlying attentional, hyperactive/impulsive and emotional symptoms. Confirming this hypothesis, Perroud et al. (28) have recently found that adults with ADHD show impaired RF with respect to a healthy control group and that these impairments were intrinsically linked and correlated with attention and hyperactive/impulsive symptoms.

More recently, studies with parents of children with ADHD focused on parents' general capacity to reflect on mental states (i.e., RF) with more details on parental reflective functioning (PRF). It has been argued that the capacity to reflect on a specific relationship with a significant other could differ from more general mentalizing processes (29, 30). PRF is defined as parents' capacity to comprehend the developing mind of their child, reflect upon it and hold in mind the inner life of the child. As Sharp and Fonagy (29) noted, parents' capacity to engage their child in an accurate and appropriate way, is influenced by their own RF and the child's characteristics, especially their temperament. Previous studies have indicated that the parental capacity to give meaning to children's behavior shapes the parents' affective and behavioral reactions to the child (31). It has been hypothesized that the parents' capacity of children with ADHD to think about the mental processes underlying children's expressed emotions and behaviors, enhances their ability to contain the child's emotional and physical needs, leading to improvement in managing the child's distress (32, 33). In a sample of parents of children seeking ADHD treatment, Gershy and Gray (9) found that parents' capacity for mentalization serves as a buffer against parental hostile feelings, specifically among emotionally dysregulated parents. Parents' capacity to use mentalization while describing their child was assessed with mind-mindedness (34), using a single question interview in which parents were asked to describe their child. These findings highlight the potential role of parental mentalization as a protective mechanism in families of children with ADHD.

Recently, a more cost-effective and less time-consuming new measure to assess parents' capacity for mentalization has been validated. The Parental Reflective Functioning Questionnaire [PRFQ; (35)] is a brief and multidimensional assessment tool, quite different from mind—mindedness used in the previous study with parents of children with ADHD by Gershy and Gray (9). Studies that have assessed PRF using the PRFQ have shown that a parent's capacity to mentalize may be a critical factor in tolerating an infant's distress, enhancing more positive discipline strategies, and perceiving less parenting stress (33, 36–38). Hence, these studies showed that PRF may foster feelings of efficacy in dealing with distressing situations and interactions. As no research to date have assessed PRF with the PRFQ, and only one study has investigated mind mindedness in a sample of parents of children seeking ADHD treatment, studies exploring differences in PRF in parents of children with ADHD are needed.

Given the need to expand knowledge of the relationship between ADHD and parenting dimensions, specifically PRF, as

a starting point, a cross-sectional and correlational study was carried-out. The aims of this study were as follows:

(1) To assess anxiety, symptoms of depression, and co-parenting alliances in both mothers and fathers, comparing parents of children with/without ADHD. Given that, until now, most extant research has focused mainly on mothers, to explore the possible role of fathers seems to be crucial;

(2) To investigate potential PRF impairments in parents of children with ADHD. Until now, no studies have compared parents' PRF in a clinical and control group. We hypothesized that the PRF scores of parents of children with ADHD would have been lower than those of control group;

(3) To further investigate the relation between the aforementioned parental and familial factors and the probability of increased risk of belonging to the clinical group. A higher probability of the presence of ADHD was expected to be related to higher parental symptomatology, lower parental alliances, and lower levels of PRF.

METHODS

Participants and Procedure

In order to estimate the sample size, power analysis was carried-out using G*Power 3.1 (39). Three factors were considered, both for logistic regression and MANOVA. With regard to logistic regression, odds ratio = 2 ($p_{H1} = 0.25$, $p_{H0} = 0.15$), $\alpha = 0.05$, and power = 0.90 were selected. Power analysis indicated that there was a 90% chance of correctly rejecting the null hypothesis that predictor variable was not associated with outcome variable, with a sample of 168 participants. As to MANOVA, a significant level of 0.05, a small effect size for a conservative approach ($f^2 = 0.10$), and a power of 0.90 were considered. Power analysis indicated a total sample size of 100 participants. Thus, one hundred and seventy-eight parents of children aged 8–11 were recruited.

Eight children belong to the control group were excluded for data analysis due to presence of difficulties referred by their parents or because they were under psychologically treatment. Therefore, the sample included 162 parents of 81 children aged 8 and 11 years (69.1% males); see **Table 1**.

The clinical group consisted of 41 children (mean age = 9.37 years; $SD = 1.68$), including 34 males and 7 females and their parents enrolled from two clinical centers in central Italy specialized in the assessment and treatment of neurodevelopmental disorders. The clinical group was selected by means of the director of the centers from their clinical populations, on the basis of the following inclusion criteria: (a) children having ADHD at their first diagnosis, according to DSM-5 criteria; (b) children having an $IQ > 70$; and (c) parents having good knowledge and fluency of the Italian language. All of the cases selected participated in the study and completed the measures at the center during a visit within the assessment phase. For the clinical group, the mean age of mothers was 40.29 years ($SD = 2.72$), and the mean age of fathers was 47.21 years ($SD = 4.74$).

The control group consisted of 40 children (22 males and 18 females) matched with the clinical group on age (mean = 9.55;

$SD = 0.56$; $F = 0.426$, $p = 0.516$), as well as their parents. They were recruited through two public schools in the same region. Parents were asked to participate in the study by the teachers and were enrolled through convenience sampling in three different classes. The response rate among cases was 96%. The mean age of mothers was 42.03 years ($SD = 6.48$), and the mean age of fathers was 48.80 years ($SD = 3.48$). All the parents participating in the study completed a sociodemographic questionnaire according to Hollingshead's Four Factor Index of Social Status (40), a general form on the child regarding the presence of any illness or disability (either physical or mental) or any possible problems at school, and some questionnaires (see Measures paragraph).

Families had a middle level of socioeconomic status (SES) in both the clinical group (mean = 36.78; $SD = 7.68$) and the control group (mean = 41.05; $SD = 7.81$). ANOVA showed significant differences between the two groups ($F = 4.72$; $p = 0.033$; $\eta_p^2 = 0.056$).

Children filled in the Italian version of the Strengths and Difficulties Questionnaire [SDQ; (41)] as behavioral screening to control for differences in strength and difficulty profiles. Differences were found for the hyperactivity-inattention subscale between the clinical and control group ($F = 20.31$; $p < 0.001$; $\eta_p^2 = 0.20$). The control group showed scores within the normal range. All the participants were Caucasian. Data were collected after the parents' sign of the informed consent, according to the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (42). Approval by the Ethical Committee for Psychological Research at the Department of Philosophy and Social Sciences and Education—University of Perugia was obtained, in line with the Italian Association of Psychology (AIP) Code of Conduct.

MEASURES

Parents' Measures

State and Trait Anxiety Inventory—Y [STAI-Y; (43)]: it is a self-report consisting of 40 items that measure two kinds of anxiety using a 4-point Likert scale ranging from 1 (not at all) to 4 (very much so). Twenty items assess state anxiety (or anxiety about a specific moment or event), and 20 items assess trait anxiety (or anxiety as a personal characteristic). The STAI has good internal consistency, test-retest reliability for the STAI Trait scale, sensitivity to the detection of stress for the STAI State scale, and convergent and discriminant validity (43). The Italian version of the STAI—Y (44) was used, showing good internal consistency and adequate test-retest reliability.

Center for Epidemiologic Studies Depression Scale [CES-D; (45)]: it is a brief self-report consisting of 20 items on symptoms of depression developed to measure depression severity in the general population. According to the measure, parents were asked to respond using a 4-point Likert scale, ranging from 0 (rarely) to 3 (all of the time). The Italian version of the CES-D was used (46). The Italian version of the CES-D exhibits adequate internal consistency.

Parental Alliance Measure [PAM; (47)]: a 20-item self-report questionnaire that assesses the parenting aspects of a couple's relationship in terms of co-parenting alliance (the

TABLE 1 | Descriptive statistics in terms of means and standard deviation and frequencies for sample description.

	Clinical group			Control group					
	N	Mn	SD	N	Mn	SD	F	Δ (95% CI)	η_p^2
Children									
Male	34			22					
Female	7			18					
Age	41	9.37	1.68	40	9.55	0.57	0.426	0.184 (−0.378/0.746)	0.005
SDQ hyperactivity-inattention	41	4.39	1.37	40	2.85	1.39	20.31	−1.54 (−2.21/−0.860)*	0.204
Family									
Mothers age	41	40.29	2.72	40	42.03	6.48	2.48	1.73 (0.119/−0.457)	0.030
Fathers age	41	47.21	4.50	40	48.80	3.62	3.01	1.59 (−0.234/3.42)	0.038
SES	41	36.78	7.69	40	41.05	7.81	6.14	4.27 (0.841/7.69)*	0.070

ANOVA shows differences between the clinical (41) and control groups (40).

* $p < 0.05$ significant difference.

η_p^2 : ≥ 0.0099 small effect size; ≥ 0.0588 medium effect size; ≥ 0.1379 large effect size.

SES, socioeconomic status; SDQ, strength and difficulties questionnaire.

communication, levels of cooperation and mutual respect they exhibit with regard to their children's care) using a 5-point Likert scale that ranges from 1 (strongly disagree) to 5 (strongly agree). The Italian version was used (48). Its Cronbach's alphas show good internal consistency.

Parental Reflective Functioning Questionnaire [PRFQ; (35)]: it is a self-report measure consisting of 18 items, divided into three subscales that assess PRF. The *pre-mentalizing* (PM) subscale assesses parental difficulty in understanding and interpreting the child's mental experience; the *certainty about mental states* (CMS) subscale evaluates the parents' inability to recognize the children's mental state as readily apparent; and the *interest and curiosity* subscale (IC) assesses the parents' ability to think about the child's internal experiences and to take the child's perspective. A 7-point Likert scale from 1 (strongly disagree) to 7 (strongly agree) is used to score each item. The Italian version of the PRFQ was used, and its Cronbach's alpha exhibited good to acceptable internal consistency in both mothers and fathers separately (30).

DATA ANALYSIS

To investigate differences between parents of children with and without ADHD, multivariate analysis of variance (MANOVA) was used on parents' symptomatology (depression and anxiety) and familial and parental measures for mothers and fathers separately, with SES as covariates. Effect size was measured using partial eta-squared, in which small, medium, and large effects were 0.0099, 0.0588, and 0.1379, respectively [(49), p. 283].

In order to understand how much, parental and familial functioning levels increased the risk of belonging to the clinical group, logistic regression analyses were performed on the whole sample. All analyses were performed using SPSS, release 18 (50).

RESULTS

MANOVA showed a significant multivariate main effect of group (clinical vs. control group) on parents' depressive symptomatology, parental alliance, and PRF, both for mothers (Wilks' $\lambda = 0.423$, $F_{(1,80)} = 13.84$, $p < 0.001$, $\eta_p^2 = 0.577$)

and fathers (Wilks' $\lambda = 0.501$, $F_{(1,80)} = 9.658$, $p < 0.001$, $\eta_p^2 = 0.499$). Mean, standard deviation and the univariate main effect are shown in **Tables 2, 3**. Both mothers and fathers of the clinical group reported higher level of depression than those of the control group, with medium effect size. There were no differences for anxiety symptoms. Regarding familial factors, only the mothers of children with ADHD reported lower levels of the parental alliance than those of children without ADHD, with small effect size. Concerning PRF, mothers of clinical group referred higher PM and CSM, as well as higher IC levels than those of control group, with medium-large effect sizes. Fathers of clinical group referred higher CSM and lower IC levels than those of control group, with medium and large effect sizes, respectively. Whereas, they reported similar PM levels.

Table 4 shows a logistical regression analysis in which familial and parental factors for both mothers and fathers were entered as predictors of ADHD. The results highlighted that several familial and parental factors contribute significantly to the increased risk of belonging to the clinical group. In particular, in the mothers group, an OR of 1.07 (95% CI = 1.02–1.13) indicated a significant increase ($\beta = 0.07$, $p < 0.01$) in the odds of being in the clinical group for each unit increment of CES. The same significant effect was found in the fathers group (OR = 1.10; 95% CI = 1.02–1.17; $\beta = 0.09$, $p < 0.01$). Regarding the PRFQ subscales in the mothers group, the OR of 9.75 (95% CI = 2.59–36.71) showed a significant increase ($\beta = 2.28$, $p < 0.001$) in the odds of being in the clinical group for each unit increment of CMS. The same significant increase was observed in the fathers group (OR = 5.10; 95% CI = 1.79–14.50; $\beta = 1.63$, $p < 0.001$); however, the large CI reduced the reliability as a factor risk of both mothers' and fathers' CMS. With respect to the co-parenting alliance in the mothers group, the OR of 0.96 (95% CI = 0.933–0.992) indicated a significant decrease ($\beta = -0.04$, $p < 0.05$) in the odds of being in the clinical group for each unit increment of PAM. No significant effect was observed for fathers' perceptions of co-parenting alliances. Furthermore, in the mothers group, the OR of 0.06 (95% CI = 0.012–0.295) showed a significant decrease ($\beta = -2.83$, $p < 0.001$) in the odds of being in the clinical group for

TABLE 2 | Multivariate analysis of variance (MANOVA) for group (clinical group = 41; control group = 40) with means and standard deviations for STAI, CES, and PAM.

	Clinical group		Control group		$F_{(1,80)}$	Δ (95% CI)	η_p^2
	Mn	Sd	Mn	Sd			
Mothers							
STAI trait	42.32	6.42	42.00	6.95	0.281	−0.82 (−3.91/2.26)	0.004
STAI state	37.60	8.46	37.27	7.969	0.354	−1.10 (−4.81/2.60)	0.005
CES-D	13.37	11.95	6.27	8.10	10.00	−7.52 (−12.25/−2.78)*	0.115
PAM	74.40	17.93	83.60	13.02	5.14	8.24 (1.00/15.48)*	0.063
Fathers							
STAI trait	39.38	7.11	37.22	5.95	1.69	−2.03 (−5.13/1.08)	0.001
STAI state	34.86	7.12	34.47	7.94	0.044	1.80 (−3.97/3.21)	0.022
CES-D	12.19	11.72	4.82	6.40	11.57	−7.57 (−12.01/−3.14)*	0.135
PAM	85.27	12.60	84.92	10.47	0.163	−1.10 (−6.55/4.34)	0.002

F and associational estimates were reported. * $p < 0.05$ significant difference.

η_p^2 : ≥ 0.0099 small effect size; ≥ 0.0588 medium effect size; ≥ 0.1379 large effect size.

STAI, state and trait anxiety inventory; CES-D, center for epidemiologic studies depression scale; PAM, parental alliance measure.

TABLE 3 | Multivariate analysis of variance (MANOVA) for group (clinical group = 41; control group = 40) with means and standard deviations for the PRFQ scales.

	Clinical group		Control group		$F_{(1,80)}$	Δ (95% CI)	η_p^2
	Mn	Sd	Mn	Sd			
Mothers							
PRFQ							
PM	2.55	1.42	1.97	0.63	4.53	−0.55 (−1.06/−0.03)*	0.058
CMS	3.84	1.39	2.96	0.39	13.23	−0.87 (−0.134/−0.39)*	0.147
IC	4.92	1.51	6.39	0.32	30.24	1.39 (0.884/1.88)*	0.282
Fathers							
PRFQ							
PM	2.36	1.08	1.96	0.48	3.73	−0.38 (−0.78/0.01)	0.048
CMS	3.38	1.18	2.88	0.36	5.81	−0.49 (−0.901/−0.08)*	0.073
IC	5.08	1.32	6.14	0.48	19.31	1.03 (0.56/1.49)*	0.207

F and associational estimates were reported.

* $p < 0.05$ significant difference.

η_p^2 : ≥ 0.0099 small effect size; ≥ 0.0588 medium effect size; ≥ 0.1379 large effect size.

PRFQ, parental reflective functioning questionnaire; PM, pre-mentalizing; CMS, certainty about mental states; IC, interest and curiosity.

each unit increment of the IC subscale of the PRFQ. The same results were found for fathers (OR = 0.151; 95% CI = 0.056–0.411; $\beta = -1.89$, $p < 0.001$). Neither anxious symptomatology nor the PM subscale of the PRFQ in both parents contributed to ADHD.

DISCUSSION

The first aim of this study was to examine possible differences in symptoms of anxiety and depression and in co-parenting alliances between parents of children with ADHD and parents of control children. Results showed significant differences in parents' depressive symptomatology with medium effect size. Both mothers and fathers of clinical group reporting higher levels than those of control group. Until now, literature on parental psychological aspects seems to be inconsistent: numerous studies have reported more affective disorders in the relatives of children with ADHD than in the families

of control children, specifically for depressive symptoms (51). However, Johnston and Mash (5) highlighted that the association between parental affective disorder and child ADHD is not as strong. Some studies have not found differences in either the mothers or fathers of children with ADHD or the parents of control children (20, 52). Furthermore, only a few studies have focused on paternal psychopathology (53, 54). The present study, according to previous data, showed higher levels of internalizing disorder, specifically depressive symptoms, in both mothers and fathers of children with ADHD. No differences emerged with regard to anxious symptoms in mothers and fathers. These results seem to be in line with evidence of a greater risk of behavioral problems, including ADHD, in children of mothers with depression (20, 55, 56). These findings suggest the importance of considering fathers' depressive symptoms in further studies, as well as in clinical setting, because it seems that it is an important factor in families of children with ADHD.

TABLE 4 | Logistic regression analysis of socioeconomic status and parental and familial measures on the presence of ADHD of the whole sample.

	β	χ^2	Wald statistics	OR	95% CI
Mothers					
STAI		0.28			
STAI trait	0.005		0.013	1.00	0.927–1.08
STAI state	0.000		0.000	1.00	0.917–1.10
CES-D	0.07	8.94**	7.29**	1.07	1.02–1.13
PAM	−0.04	6.79**	5.93*	0.96	0.933–0.992
PRFQ		62.29***			
PM	−0.561		0.700	0.57	0.153–2.12
CMS	2.28		11.34***	9.75	2.59–36.71
IC	−2.83		11.89***	0.06	0.012–0.295
Fathers					
STAI		2.60			
STAI trait	0.082		2.44	1.09	0.979–1.20
STAI state	−0.48		1.15	0.95	0.872–1.04
CES-D	0.093	10.86***	7.12**	1.10	1.02–1.17
PAM	0.003	0.018	0.018	1.00	0.964–1.04
PRFQ		37.611***			
PM	−0.47		0.691	0.625	0.206–1.89
CMS	1.63		9.33**	5.10	1.79–14.50
IC	−1.89		13.68***	0.151	0.056–0.411

STAI, state and trait anxiety inventory; CES-D, center for epidemiologic studies depression scale; PAM, parental alliance measure; PRFQ, parental reflective functioning questionnaire; PM, pre-mentalizing; CMS, certainty about mental states; IC, interest and curiosity.

*Effect was statistically significant at $p < 0.05$. **Effect was statistically significant at $p < 0.01$. ***Effect was statistically significant at $p < 0.001$.

Referring family functioning, not many studies have focused specifically on co-parenting alliances. Research has documented the relation between inter-parental conflict and child behavioral problems in families with more frequent arguments regarding child-related issues (26, 57). Couples of relatives of youth with ADHD are more discordant over collaborative parenting issues than are couples who are parents of children without ADHD (5). These co-parenting difficulties could be related to significant difficulties in the management of the child (58). The present result on co-parenting alliances as perceived by parents, showed lower level of parental alliance in mothers of children with ADHD than in mothers of children in the control group. No differences between the fathers of the two groups emerged. These data could be an expression of the specific maternal parenting role and of the greater amount of time mothers often spend interacting with their children (23). Further studies may be needed to analyse this discrepancy between mothers and fathers regarding perceptions of co-parenting alliances, as the parental alliance constitutes an important factor for success in family interventions (59).

Although recent research indicates the importance of mentalization in the ADHD field, both in empirical studies and in parenting interventions, only one study to date has investigated this issue in families of children with ADHD, showing that parental mentalization could act as a buffer against parental hostility (9). Recent research demonstrating the relationship between PRF and parents' capacity to regulate their own emotions in the caregiving context indicates the importance of the meaning parents apply to children's behaviors

to determine the emotional/physiological level of arousal the parent experiences in reaction to them (9). Drawing upon these findings and upon studies showing more parenting and familial difficulties among parents of children with ADHD, the second aim of this study was to explore potential PRF impairments in parents of children with ADHD and to compare these impairments with those of a control group of parents. As expected, significant differences emerged in PRF between the two groups. Specifically, both mothers and fathers of children with ADHD, compared to the control group, showed: (a) a significantly higher non-mentalizing stance, showing more difficulties in entering the subjective world of the child; (b) a significantly higher level of certainty in mental states, showing a greater tendency toward unjustified assumptions about their child's states of mind; and (c) a significantly lower level of genuine interest and curiosity in their child's mind. Taken together, this specific combination of PRFQ scales suggested that parents of children with ADHD, in comparison to parents of children in the control group, showed greater difficulties in recognizing the opaqueness of children's mental states and in understanding that they have a limited ability to truly know what is in their child's mind. These difficulties in tolerating the uncertainty that occurs from not knowing why the child is behaving in a certain way seemed to be associated with lower genuine interest and curiosity in the child's mental states. Furthermore, parents' difficulties in understanding why their children act or feel differently from their expectations also emerged from the more high-level non-mentalizing stance, which expressed parents' tendency to make maladaptive and

malevolent attributions about the child and, broadly, to repudiate or defend against mentalizing.

Overall, parents of children with ADHD showed more difficulties in PRF capacities than parents of children without ADHD. As PRF is considered a key feature of adaptive parenting and of fostering feelings of efficacy in dealing with distressing interactions (60), these data seemed to be in line with the differences emerged in this study between the two groups in depression symptoms and parenting alliances. The presence of both parents' depression symptomatology, maternal perceptions of a low co-parenting alliance, and low PRF also played a significant role as risk factors of belonging to the clinical group, as investigated in the third aim of this study.

Difficulties in parents' capacity to give meaning to children's behavior shape the parents' affective and behavioral reactions to the child, making parents feel more helpless, fatigued and unsupported. As Sharp and Fonagy (29) noted, the parental capacity to engage in accurate and appropriate mentalizing (PRF) is considered to be also influenced by child characteristics, and mutual affect regulation and attunement are assumed to characterize dyadic interactions from birth onwards. The effects are likely to be complex, and over time, both children and parents may be reinforced for maladaptive behaviors. As outlined by Nijssens et al. (38), the lack of feelings of control and efficacy that may be experienced by parents with poorer PRF could entail an increasing belief that interactions spiral out of control, an issue frequently described in families with children with ADHD. Furthermore, the present finding on PRF substantiated the increasing attention paid to the role of mentalization both in empirical studies and in parenting interventions in the ADHD field, highlighting the potential role of enhanced parental capacity to think about the mental processes underlying children's expressed emotions and behaviors in families of children with ADHD.

Taken together, these findings on PRF add to the body of knowledge about the role of sensitive, supportive parenting in the developmental pathways through which child and family characteristics transact to exert their influences over time (5).

Furthermore, as the majority of the research on parental features as a risk or protective factor for children's developmental outcomes has investigated mothers, the present findings highlight the need for further study of the father-child relationship, which has in the past been somewhat neglected in comparison to the mother-child relationship (61).

Several limitations must be addressed in the present study. The main limitation is that it is based on self-report questionnaires. Further replication of the findings from this study is therefore needed with interviews and observer-based measures. Furthermore, results cannot support causal relationships among variables and no-ADHD/ADHD given that the data were cross-sectional in nature. Finally, given the small size of the group because the disorder is very rare, the results of this study must be interpreted with caution, and more research in larger groups is needed, even though sample size was adequate according to power analysis.

Overall, the results confirmed previous studies on substantial differences between families of children with ADHD and parents

of no-ADHD controls in parental psychopathology and parental functioning (7). This study adds to previous research on PRF, showing more difficulties among both parents in understanding the underlying reasons for the child's behavior, with respect to the control group. The difficulties that emerged in PRF capacities may bear clinical significance in suggesting early interventions targeting PRF. With respect to parenting interventions, studies have shown that improvement in mothers' insightfulness was associated with a decrease in children's behavior problems (62). Moreover, the most recent family-based intervention approaches for ADHD have begun to consider mentalization to promote empathy and emotion regulation in parents and their children, but studies are still scarce (63). Considering the difficulties that parents of children with ADHD face and the effect of parenting dysfunction on children, several interventions for parents of children with ADHD have been developed, mostly of a psycho-educational style and cognitive behavioral therapy orientation, focusing largely on guidance and skill training (64–67). In contrast, the present findings suggest as a focus of treatment the parents' capacity to envision their child as being motivated by internal mental states and to be able to reflect on their own internal mental experiences and how they are shaped and changed by interactions with the child (35).

DATA AVAILABILITY

The datasets for this manuscript are not publicly available because for privacy and ethics reasons. Requests to access the datasets should be directed to CM.

ETHICS STATEMENT

Data were collected after parents had signed the informed consent form to participate to the study, according to the Ethical Principles of Psychologists and Code of Conduct of the American Psychological Association (42). Approval by the Ethical Committee for Psychological Research at the Department of Philosophy and Human Sciences of Perugia University was obtained, in line with Italian Association of Psychology (AIP) Code of Conduct.

AUTHOR CONTRIBUTIONS

CM: substantial contribution to the conception of the work, to the research design, to data collection and interpretation, drafting the work, and final approval of the version. CM will be accountable for all aspects of the paper. LB: substantial contribution to data analysis, drafting the paper, and approval of the version to be published. AG: contribution to data analysis and agreement to be accountable for all aspects of the paper. CC, RG, and MM: contribution to data collection and agreement to be accountable for all aspects of the paper. CP: substantial contribution to data collection and interpretation, drafting the work, approving the final version, and agreement to be accountable for all aspects of the paper.

REFERENCES

- American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Arlington, VA: American Psychiatric Publishing (2013). doi: 10.1176/appi.books.9780890425596
- Wahlstedt C, Thorell LB, Bohlin G. Heterogeneity in ADHD: neuropsychological pathways, comorbidity and symptom domains. *J Abnorm Child Psychol*. (2009) 37:551–64. doi: 10.1007/s10802-008-9286-9
- Garner AA, O'Connor BC, Narad ME, Tamm L, Simon J, Epstein JN. The relationship between ADHD symptom dimensions, clinical correlates, and functional impairments. *J Dev Behav Pediatr*. (2013) 34:469–77. doi: 10.1097/DBP.0b013e3182a39890
- Harold GT, Leve LD, Barrett D, Elam K, Neiderhiser JM, Natsuaki MN, et al. Biological and rearing mother influences on child ADHD symptoms: revisiting the develop mental interface between nature and nurture. *J Child Psychol Psychiatry*. (2013) 54:1038–46. doi: 10.1111/jcpp.12100
- Johnston C, Mash EJ. Families of children with attention-deficit/hyperactivity disorder: review and recommendations for future research. *Clin Child Family Psychol Rev*. (2001) 4:183–207. doi: 10.1023/A:1017592030434
- Thapar A, Harrington R, McGuffin P. Examining the comorbidity of ADHD-related behaviours and conduct problems using a twin study design. *Br J Psychiatry*. (2001) 179:224–9. doi: 10.1192/bjp.179.3.224
- Sollie H, Mørch WT, Larsson BJ. Parent and family characteristics and their associates in a follow-up of outpatient children with ADHD. *J Child Family Stud*. (2016) 25:2571–84. doi: 10.1007/s10826-016-0411-z
- Lifford K, Harold G, Thapar A. Parent-child relationships and ADHD symptoms: a longitudinal analysis. *J Abnorm Child Psychol*. (2008) 36:285–96. doi: 10.1007/s10802-007-9177-5
- Gershly N, Gray S. Parental emotion regulation and mentalization in families of children with ADHD. *J Attent Disord*. (2018). doi: 10.1177/1087054718762486. [Epub ahead of print].
- Ullsperger JM, Nigg JT, Nikolas MA. Does child temperament play a role in the association between parenting practices and child attention deficit/hyperactivity disorder? *J Abnorm Child Psychol*. (2016) 44:167–78. doi: 10.1007/s10802-015-9982-1
- Deault LC. A systematic review of parenting in relation to the development of comorbidities and functional impairments in children with attention-deficit/hyperactivity disorder (ADHD). *Child Psychiatry and Human Development*. (2010) 41:168–92. doi: 10.1007/s10578-009-0159-4
- Modesto-Lowe V, Danforth J, Brooks D. ADHD: Does parenting style matter? *Clin Pediatr*. (2008) 47:865–72. doi: 10.1177/0009922808319963
- Chronis AM, Lahey BB, Pelham WE Jr, Kipp HL, Baumann BL, Lee SS. Psychopathology and substance abuse in parents of young children with attention-deficit/hyperactivity disorder. *J Am Acad Child Adolesc Psychiatry*. (2003) 42:1424–32. doi: 10.1097/00004583-200312000-00009
- Cunningham CE, Boyle MH. Preschoolers at risk for attention-deficit hyperactivity disorder and oppositional defiant disorder: family, parenting, and behavioral correlates. *J Abnorm Child Psychol*. (2002) 30:555–69. doi: 10.1023/A:1020855429085
- Cussen A, Sciberras E, Ukoumunne OC, Efron D. Relationship between symptoms of attention-deficit/hyperactivity disorder and family functioning: a community-based study. *Eur J Pediatr*. (2012) 171:271–80. doi: 10.1007/s00431-011-1524-4
- Ghanizadeh A, Mohammadi MR, Moini R. Comorbidity of psychiatric disorders and parental psychiatric disorders in a sample of Iranian children with ADHD. *J Attent Disord*. (2008) 12:149–55. doi: 10.1177/1087054708314601
- Segenreich D, Fortes D, Coutinho G, Pastura G, Mattos P. Anxiety and depression in parents of a Brazilian non-clinical sample of attention-deficit/hyperactivity disorder (ADHD) students. *Braz J Med Biol Res*. (2009) 42:465–9. doi: 10.1590/S0100-879X2009000500011
- Margari F, Craig F, Petruzzelli MG, Lamanna A, Matera E, Margari L. Parents psychopathology of children with attention deficit hyperactivity disorder. *Res Dev Disabil*. (2013) 34:1036–43. doi: 10.1016/j.ridd.2012.12.001
- Durukan I, Koray K, Mahmoud A, Dursun K, Hesna G. Alexithymia, depression and anxiety in parents of children with neurodevelopmental disorder: comparative study of autistic disorder, pervasive developmental disorder not otherwise specified and attention deficit-hyperactivity disorder. *Pediatr Int*. (2018) 60:247–53. doi: 10.1111/ped.13510
- Elgar FJ, Waschbusch DA, McGrath PJ, Stewart SH, Curtis LJ. Temporal relations in daily-reported maternal mood and disruptive child behavior. *J Abnorm Child Psychol*. (2004) 32:237–47. doi: 10.1023/B:JACP.0000026138.95860.81
- Cheung K, Theule J. Parental psychopathology in families of children with ADHD: a meta-analysis. *J Child Family Stud*. (2016) 25:3451–61. doi: 10.1007/s10826-016-0499-1
- Kaplan BJ, Crawford SG, Fisher GC, Dewey DM. Family dysfunction is more strongly associated with ADHD than with general school problems. *J Attent Disord*. (1998) 2:209–16. doi: 10.1177/108705479800200401
- Harvey EA. Parenting similarity and children with Attention-Deficit/Hyperactivity Disorder. *Child Family Behav Ther*. (2000) Vol. 22:39–54. doi: 10.1300/J019v22n03_02
- Kvist AP, Nielsen HS, Simonsen M. The importance of children's ADHD for parents' relationship stability and labor supply. *Soc Sci Med*. (2013) 88:30–38. doi: 10.1016/j.socscimed.2013.04.001
- Shelton TL, Barkley RA, Crosswait C, Moorehouse M, Fletcher K, Barrett S, et al. Psychiatric and psychological morbidity as a function of adaptive disability in preschool children with aggressive and hyperactive impulsive inattentive behavior. *J Abnorm. Child. Psychol*. (1998) 26:475–94.
- Grych JH, Fincham FD. Marital conflict and children's adjustment: a cognitive-contextual framework. *Psychol Bull*. (1990) 108:267–90. doi: 10.1037/0033-2909.108.2.267
- Allen JG, Fonagy P, Bateman AW. *Mentalizing in Clinical Practice*. Washington, DC: American Psychiatric Press (2008).
- Perroud N, Badoud D, Weibel S, Nicastro R, Hasler R, Kung AL, et al. Mentalization in adults with attention deficit hyperactivity disorder: comparison with controls and patients with borderline personality disorder. *Psychiatry Res*. (2017) 256:334–41. doi: 10.1016/j.psychres.2017.06.087
- Sharp C, Fonagy P. The parent's capacity to treat the child as a psychological agent: constructs, measures and implications for developmental psychopathology. *Soc Dev*. (2008) 17:737–54. doi: 10.1111/j.1467-9507.2007.00457.x
- Pazzagli C, Delvecchio E, Raspa V, Mazzeschi C, Luyten P. The parental reflective functioning questionnaire in mothers and fathers of school-aged children. *J Child Fam Stud*. (2018) 27:80–90. doi: 10.1007/s10826-017-0856-8
- Fonagy P, Target M, Gergely G, Jurist E. *Affect Regulation, Mentalization, and the Development of the Self*. New York, NY: Other Press (2002).
- Fonagy P, Target M. Attachment and reflective function: their role in self-organization. *Dev Psychopathol*. (1997) 9:679–700. doi: 10.1017/S0954579497001399
- Rutherford HJV, Goldberg B, Luyten P, Bridgett DJ, Mayes LC. Parental reflective functioning is associated with tolerance of infant distress but not general distress: evidence for a specific relationship using a simulated baby paradigm. *Infant Behav Dev*. (2013) 36:635–41. doi: 10.1016/j.infbeh.2013.06.008
- Meins E, Fernyhough C, Wainwright R, Clark-Carter D, Das Gupta M, Fradley E, et al. Pathways to understanding mind: construct validity and predictive validity of maternal mind-mindedness. *Child Dev*. (2003) 74:1194–211. doi: 10.1111/1467-8624.00601
- Luyten P, Mayes L, Nijssens L, Fonagy P. The parental reflective functioning questionnaire: development and preliminary validation. *PLoS ONE*. (2017) 12:e0176218. doi: 10.1371/journal.pone.0176218
- Rutherford H, Booth C, Luyten P, Bridgett D, Mayes L. Investigating the association between parental reflective functioning and distress tolerance in motherhood. *Infant Behav Dev*. (2015) 40:54–63. doi: 10.1016/j.infbeh.2015.04.005
- Rostad WL, Whitaker DJ. The association between reflective functioning and parent-child relationship quality. *J Child Family Stud*. (2016) 25:2164. doi: 10.1007/s10826-016-0388-7
- Nijssens L, Bley D, Casalin S, Vliegen N, Luyten P. Parental attachment dimensions and parenting stress: the mediating role of parental reflective functioning. *J Child Fam Stud*. (2018) 27:2025–36. doi: 10.1007/s10826-018-1029-0

39. Faul F, Erdfelder E, Buchner A, Lang A-G. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods*. (2009) 41:1149–60. doi: 10.3758/BRM.41.4.1149
40. Mueller CW, Parcel TL. Measures of socioeconomic status: alternatives and recommendations. *Child Dev*. (1981) 52:13–30. doi: 10.2307/1129211
41. Di Riso D, Salcuni S, Chessa D, Raudino A, Lis A, Altoè G. The Strengths and Difficulties Questionnaire (SDQ). Early evidence of its reliability and validity in a community sample of Italian children. *Pers Individ Diff*. (2010) 49:570–5. doi: 10.1016/j.paid.2010.05.005
42. American Psychological Association. *Ethical Principles of Psychologists and Code of Conduct*. (2010). Available online at: <http://apa.org/ethics/code/index.aspx>
43. Spielberger CD. *State-Trait Anxiety Inventory: Bibliography*. 2nd ed. Palo Alto, CA: Consulting Psychologists Press (1989).
44. Pedrabissi L, Santinello M. Verifica della validità dello STAI forma Y di Spielberger. *Bollettino Psicopatol*. (1989) 191:11–4.
45. Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas*. (1977) 1:385–401. doi: 10.1177/014662167700100306
46. Fava GA. Assessing depressive symptoms across cultures: Italian validation of the CES-D self-rating scale. *J clin. Psychol*. (1983) 39:249–51. doi: 10.1002/1097-4679(198303)39:2<249::AID-JCLP2270390218>3.0.CO;2-Y
47. Konold T, Abidin R. Parenting alliance: a multifactor perspective. *Assessment*. (2001) 8:47–65. doi: 10.1177/107319110100800105
48. Delvecchio E, Chessa D, Di Riso D, Mabilia D, Lis A, Mazzeschi C. Construct validity of the parental alliance Measure in a sample of 1444 Italian parents. *Appl Psychol Bull*. (2014) 271:54–64. Available online at: https://www.researchgate.net/publication/270216717_Construct_validity_of_the_Parental_Alliance_Measure_in_a_sample_of_1444_Italian_parents
49. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. 2 ed. Hillsdale, NJ: Erlbaum (1988).
50. SPSS Inc. *PASW Statistics for Windows*. Chicago, IL: SPSS Inc. Released Version 18.0. (2009).
51. Brown RT, Pacini JN. Perceived family functioning, marital status, and depression in parents of boys with attention deficit disorder. *J Learn Disabil*. (1989) 22:581–7. doi: 10.1177/002221948902200911
52. Elgar FJ, Curtis LL, McGrath PJ, Waschbusch DA, Stewart SH. Antecedent-consequence conditions in maternal mood and child adjustment: a four-year cross-lagged study. *J Clin Child Adolesc Psychol*. (2003) 32:362–74. doi: 10.1207/S15374424JCCP3203_05
53. Chang LR, Chiu YN, Wu YY, Gau SSF. Father's parenting and father-child relationship among children and adolescents with attention-deficit/hyperactivity disorder. *Compreh Psychiatry*. (2013) 54:128–40. doi: 10.1016/j.comppsy.2012.07.008
54. Romirowsky AM, Chronis-Tuscano A. Paternal ADHD symptoms and child conduct problems: is father involvement always beneficial? *Child Care Health Dev*. (2013) 40:706–14. doi: 10.1111/cch.12092
55. Gartstein MA, Sheeber L. Child behavior problems and maternal symptoms of depression: a mediational model. *J Child Adolesc Psychiatr Nurs*. (2004) 17:141–50. doi: 10.1111/j.1744-6171.2004.tb00011.x
56. Chronis AM, Lahey BB, Pelham WE Jr, Williams SH, Baumann BL, Kipp H, et al. Maternal depression and early positive parenting predict future conduct problems in young children with attention-deficit/hyperactivity disorder. *Dev Psychol*. (2007) 43:70–82. doi: 10.1037/0012-1649.43.1.70
57. Emery RE. Family conflict and its developmental implications: a conceptual analysis of deep meanings and systemic processes. In: Shantz CU and Hartup WW, editors. *Conflict in Child and Adolescent Development*. New York, NY: Cambridge University Press (1992). p. 270–298.
58. Wymbs BT, Pelham WE Jr. Child effects on communication between parents of youth with and without ADHD. *J Abnorm Psychol*. (2010) 119:366–75. doi: 10.1037/a0019034
59. Weissman SH, Cohen RS. The parenting alliance and adolescence. *Adolesc Psychiatry*. (1985) 12:24–45.
60. Turner JM, Wittkowski A, Hare DJ. The relationship of maternal mentalization and executive functioning to maternal recognition of infant cues and bonding. *Br J Psychol*. (2008) 99:499–512. doi: 10.1348/000712608X289971
61. Keown LJ. Predictors of boys' ADHD symptoms from early to middle childhood: the role of father-child and mother-child interactions. *J Abnorm Child Psychol*. (2012) 40:569–81. doi: 10.1007/s10802-011-9586-3
62. Koren-Karie N, Oppenheim D, Goldsmith DF. Keeping the inner world of the child in mind: Using the insightfulness assessment with mothers in therapeutic preschool. In: Oppenheim D and Goldsmith DF, editors. *Attachment Theory in Clinical Work With Children*. New York, NY: Guilford Press (2007). p. 31–57.
63. Pezzica S, Bigozzi L. Un parent training cognitivo comportamentale e mentalizzante per bambini con ADHD. *Psicologia Clinica dello Sviluppo*. (2015) 2:271–96. Available online at: https://www.researchgate.net/publication/282075153_Un_Parent_Training_cognitivo_comportamentale_e_mentalizzante_per_bambini_con_ADHD
64. National Institute of Health and Clinical Excellence. *Attention Deficit Hyperactivity Disorder: NICE Guideline Short Version DRAFT*. (2017). Available online at: <https://www.nice.org.uk/guidance/ng87/documents/short-version-of-draft-guideline>
65. Ziperfal M, Shechtman Z. Psychodynamic group intervention with parents of children with attention-deficit/hyperactivity disorder: outcomes for parents and their children. *Group Dyn Theory Res Pract*. (2017) 21:135–47. doi: 10.1037/gdn0000069
66. Daley D, Jones K, Hutchings J, Thompson M. Attention deficit hyperactivity disorder in pre-school children: current findings, recommended interventions and future directions. *Child Care Health Dev*. (2009) 35:754–66. doi: 10.1111/j.1365-2214.2009.00938.x
67. Conners CK, March JS, Frances A, Wells KC, Ross R. Treatment of attention deficit hyperactivity disorder: expert consensus guidelines. *J Attent Disord*. (2001) 4:7–128. doi: 10.1177/108705470000401s02

Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Mazzeschi, Buratta, Germani, Cavallina, Ghignoni, Margheriti and Pazzagli. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



The Development of Instruments to Detect Indicators of Behavioral Changes in Therapeutic Communities: A Clinical Case Study

Stefania Cristofanelli¹, Agata Ando^{1,2*} and Laura Ferro¹

¹ Department of Social Sciences and Humanities, University of Valle D'Aosta, Aosta, Italy, ² Department of Psychology, University of Turin, Turin, Italy

OPEN ACCESS

Edited by:

Daniela Di Riso,
University of Padova, Italy

Reviewed by:

Figen Cavusoglu,
Ondokuz Mayıs University, Turkey
Shahanawaz Syed,
University of Hail, Saudi Arabia

*Correspondence:

Agata Ando'
agatamariaclaudia.ando@unito.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 31 October 2018

Accepted: 16 October 2019

Published: 22 November 2019

Citation:

Cristofanelli S, Ando' A and Ferro L
(2019) The Development of
Instruments to Detect Indicators of
Behavioral Changes in Therapeutic
Communities: A Clinical Case Study.
Front. Public Health 7:319.
doi: 10.3389/fpubh.2019.00319

Clinicians involving in the treatment of adolescent patients should use a valid and efficient psychological assessment. The evaluation of the efficiency in clinical interventions may provide helpful information in terms of cost-effectiveness and may contribute to increase the quality and efficacy of the public services. Despite the importance of clinical and therapeutic interventions, we may observe several aspects limiting the chance in using them. For example, the neuropsychiatry context due to heterogeneous users (such as children and adolescents) makes the replicability of clinical trials difficult in terms of results. Thus, efficient clinical programs and interventions—potentially able to identify specific and long-term effects—need to be defined. In clinical contexts (i.e., therapeutic communities). It should be a priority both to manage aspects of emergency/urgency we may observe in adolescents, and to focus on those aspects placed on a timing dimension. The current study reports a description of innovative measures developed specifically for assessing adolescent patients and for tracking psychological features and behavioral changes. Furthermore, a clinical case is examined by using a multimethod assessment including such innovative measures. Clinical implications are discussed. The development and sharing of “assessment cultures” among professionals should represent a priority in improving the effectiveness of therapeutic communities.

Keywords: psychological assessment, therapeutic communities, psychological functioning, behavioral problems, adolescence

INTRODUCTION

The therapeutic community (TC) is an intensive and comprehensive treatment model, developed for treating adults and adolescents with psychopathology. The core goal of TCs is to promote a healthy lifestyle, and to identify those areas for changes such as negative behaviors leading to no adaptive conditions (1, 2). In TCs, individuals are distinguished along dimensions of psychological dysfunction and social deficits; indeed, a considerable number of patients never has acquired conventional lifestyles, and specific educational deficits are marked, and several values are either missing or unpursued. Most often, patients derive from a socially disadvantaged sector where dysfunctional behaviors are considered as a social response rather than a psychological disturbance (3).

The Community of Communities (C. of C.) is a quality improvement and accreditation programme for Therapeutic Communities in the UK and overseas. The Community of Communities' activities support members to meet the highest standards of TC practice through a process of self- and peer-review. Members of TCs work with adults and children with a range of multiple needs including personality disorders, offending behaviors, learning disabilities, addictions, and severe mental illness. The C. of C. combines the application of Service Standards for a quality improvement with the benefits of a peer-support network. The Service Standards for Therapeutic Communities for Children and Young People are decided every year and are applied through a process of self- review, and external peer review where members visit each other's services (4).

The evaluation of indicators of the change of outcomes and processes in clinical interventions is becoming increasingly important in Italy, especially in the public health context. Therapeutic Communities for children and adolescents may be described as a set of heterogeneous services, based on different organizational procedures, driven by a set of values and practice standards, accruing from multiple theoretical foundations and numerous service delivery traditions. Therefore, the services are significantly different from one another and cannot be described by applying an unitary model with a single set of definite outcomes. At this point, the necessity that the TC staff works toward greater explicitness, consistency, and cohesiveness may be urgent and compelling (5, 6). The main goal of the current study was to identify and develop specific tools in order to assess behavioral changes in adolescent therapeutic communities. Specifically, we conducted a single case study using a multimethod assessment including measures for evaluating specific psychological dimensions associated to behavioral changes over time.

Measures Development

Psychotherapists, psychiatrists, and psychologists with a long clinical experience in therapeutic communities, and expert researchers in the psychological assessment field¹ discussed and worked on the development of specific measures for assessing adolescents in therapeutic communities; specifically, after revising the scientific literature on residential care contexts and adolescent therapeutic communities [e.g., (7, 8)], and previous clinical data, they identified those measures (to include in the assessment) that were potentially able to evaluate specific psychological dimensions [i.e., belongingness and motivation, self-esteem and self-regulation, and interpersonal relationships underlying possible related observable behaviors; (9–11)]. The description of the measures is reported below.

The Medical History Form

The neuropsychiatrist completes the medical history form, a tool including patient's anamnesis and information on the family system.

The Daily Behaviors Logbook

By using the behaviors logbook, health educators report daily specific behavioral patterns in a patient, as follows. (A1) *Structured group activities* (i.e., eating occasions, excursions, and creative laboratories); the response options for each question are two: *attending, not attending*; (A2) *How behaviors occur in those structured activities*. The response options are the following: *negatively, positively*. (B) *Psychological crisis types*. The responses options are the following: *aggressive, dysphoric*. (C) *Family relationships* (i.e., meeting and calling his/her relatives); the response options are the following: *negatively, positively*. (D) *Other behaviors and events* (i.e., hospitalization, police intervention, school attendance; work/traineeship attendance, sickness, request for the drug therapy; escape from the community, and personal hygiene); the response options are three: *yes, no, I do not know*. (E) *Daily Mood*; the response options are the following: *worried, serene, cheerful, depressed, hyperactive, angry, sad, passive, upset, nervous, anxious*.

The Therapeutic Project Report

Clinicians complete the therapeutic project report describing the patient's behavior and overall psychological functioning in following contexts. (A) *Homecomings* (i.e., homecoming events; desire to return to home, negative homecomings, returns to the community soon after the homecoming are positive). (B) *School management* (i.e., motivation to go school, low academic achievement, school attendance, good peer relations). (C) *Living in the therapeutic community* (i.e., good interactions with educators, conflictual interpersonal interactions, proactive behaviors). (D) *Family relationships* (i.e., positive meeting/call to his/her relatives, presence of family members in the patient's life, negative interactions with family members, family members cause severe discomforts in the patients). (E) *Traineeship/work context* (i.e., work motivation, good academic achievement, poor work attendance, negative relations with his/her coworkers). (F) *Sociability and interpersonal relations* (i.e., frequency of friendly and positive relationships outside the community, desire to have friendly and positive relationships outside the community). (G) *Romantic Relationships* (i.e., desire to have a romantic relationship; being in a romantic relationship). (H) *Personal Care* (i.e., good personal hygiene, autonomy in his/her personal care, adequate clothing, clean clothing). (I) *Management of his/her physical and mental health* (i.e., attendance at clinical interviews; adherence to the medication regimen; request for the drug therapy. (L) *Money management* (i.e., efficient and adequate money management). The response options for all aforementioned items are the following: *never, seldom, sometimes, often, always*. (M) *Ability to control impulsive behaviors* (i.e., level of emotional and cognitive resources, negative emotions, experiences of environmental stress). (N) *Affectivity* (i.e., awareness and understanding of emotions, behavior when experiencing emotions, regulation of emotions effectively, tendency to have negative secondary emotional responses to one's negative emotions). (O) *Self-perception and Interpersonal relationships* (i.e., level of introspective ability, narcissistic features, negative self-perceptions, self-esteem, mental representations of other people, inflexibility in

¹The current study was conducted in Piedmont (Italy).

relationships, autonomy in relationships). (P) *Reality testing* (i.e., efficiency of reality testing). The response options for each item included in *Ability to control impulsive behaviors*, *Affectivity*, *Self-Perception and Interpersonal relationship*, and *Reality testing* domains are the following: *Very low*, *Low*, *Moderate*, *High*, *Very high*. The therapeutic project report is completed quarterly.

Clinical Supervision Report

The Clinical Supervision Report includes the exchange of qualitative information between clinicians, on patient's behaviors and interactions (e.g., with family, with clinicians and health educators, with coworkers, with peers). Clinicians, quarterly, complete this report. The Clinical Supervision Report aims to include an exchange of information between clinicians on specific areas of the psychological functioning in patients. It represents a clinical discussion on the psychological functioning of the patient according to multiple points of view of all clinicians working with adolescents. Information reported by The Clinical Supervision Report has practical and clinical significance given that it may be shared with the health educators taking charge of users daily.

Information obtained by the aforementioned tools is collected and organized with Google forms.

THE CLINICAL CASE STUDY: BACKGROUND AND RESULTS

The Medical History Sheet

Pietro² is a 16-year-old male. His father is currently unemployed due to instable health conditions (he is affected by cardiopathic, diabetic, asthmatic problems); he is described by Pietro as a detached and not authoritative figure, but previously aggressive toward his family. Some members of the original family of Pietro's father are characterized by aggressive and defiant behaviors. Pietro's mother is a worker. She usually shows feelings of infantile reactions to frustrating conditions. She is not able to assume the "parent role" having established an equal relationship with Pietro (Pietro seems to be considered as partner or a little brother by his mother). Pietro's mother and maternal grandfather are affected by severe affective disorders. Pietro's older brother (he is 22 years old), lives with his parents and he is considered by the family as "the only right and nice son." Currently, he shows severe withdrawal behaviors.

Pietro's family seems to have failed in providing for Pietro emotional and physical needs; Parents are characterized by clearly immature and incompetent personalities. Family communication patterns severely increased the dysfunctional expression of feelings in Pietro. Pietro growing up in such family developed low self-esteem and felt that his needs were not important or were not taken seriously by his family. When was 5 years received a diagnosis of intellectual disability showing deficits in general mental abilities such judgment and learning from experience. The deficits resulted in impairments of the overall adaptive functioning. During his early adolescence, Pietro showed serious behavioral and emotional disorders displaying a pattern of disruptive and violent behavior, and problems in

TABLE 1 | The daily behaviors logbook.

	Scores		
	Frequency %		
The daily behaviors logbook	T1 (%)	T2 (%)	T3 (%)
(A1) Structured group activities (attending)			
Eating occasions	96	97.2	84.3
Excursions	38	41	31
Creative laboratories	30	31.8	21.1
(A2) How behaviors occur in those structured activities (positively)			
Eating occasions	89.5	95.5	68.4
Excursions	40.4	34.1	31.6
Creative Laboratories	17.5	22	15.8
B) Psychological crisis type (occurrence)			
Aggressive	0	2.4	0
Dysphoric	0	0	1
(C) Family relationships (positively)			
Meeting and Calling his/her relatives	29.8	31.7	15.8
(D) Other behaviors and events (yes)			
Hospitalization	0	0	0
Police Interventions	0	0	0
School Attendance	1.8	17.1	31.6
Sickness	3.5	2.4	0
Request for the drug therapy;	56.1	9.8	5.3
Escapes from the community	4	0	0
Personal Hygiene	64	87.8	78.9
(E) Daily Mood (presence of mood)			
Worried	5.3	4.9	0
Serene	61.4	78	84.2
Cheerful	38.6	56.1	52.6
Depressed	1.8	0	0
Hyperactive	7	17.1	5.3
Angry	10.5	9.8	5.3
Sad	5.3	2.4	10.5
Passive	1.8	0	0
Upset	19.3	19.5	10.5
Nervous	15.8	12.2	21.1
Anxious	10.5	9.8	0

Data are grouped in three times. The frequencies percentage of response options for each question is included.

following rules; in addition, Pietro used cannabis showing a severe distress. Therefore, he attended several residential child-care institutions. Subsequently, Pietro received a diagnosis of Bipolar I disorder by neuropsychiatrists, in the current adolescent therapeutic community³.

The Daily Behaviors Logbook

We grouped daily information and data in three times (see **Table 1**): T1 (from March 2017 to June 2017), T2 (from July 2017 to November 2017), T3 (from December 2017 to February 2018).

³This therapeutic community for adolescences is located in a small city of Piedmont.

²Pietro is a fictitious name.

In **Table 1**, we reported the percentage of the response options for each question, during the three times.

The presence of Pietro during eating occasions, excursion and creative laboratories is more frequent at T2 than T1 and T3; Pietro's behaviors seem to be more adequate and positive regarding the eating occasions and creative laboratories during T2 than T1 and T3. Differently, a less positive attitude occurs during the excursions at T2 than the other two times. Pietro reports aggressive crises only at T2. He calls more frequently his relatives at T2 than T1 and T3. Pietro's school attendance is higher at T2 respect to the other two times, while some episodes of sickness result to be more frequent at T1. It is noteworthy that the frequency of requesting for psychiatric drugs decreases in T3. Pietro escapes from the community exclusively during T1. Personal hygiene occurs especially at T2. The mood that Pietro shows more frequently in all three times is the "serene mood," while the moods less reported by Pietro are "worried," "passive," "depressed," and "anxious."

The Therapeutic Project Report

In **Table 2**, we reported the response options for each question, during the three times. Pietro returns more frequently to home at T3 (also his desire to go to home is especially reported during T3). Sometimes at T3, we can observe the occurrence of negative homecomings and positive returns to the community soon after his homecomings. Motivation to go to school, low academic achievement and school attendance are often present at T3, while good relations with peers occur sometimes (at T3). Pietro shows frequently good interactions with educators, and proactive behaviors in the TC context at T3, while conflictual interpersonal interactions occur sometimes in all three times. Furthermore, we can observe sometimes at T3, the constant presence of family members, negative interactions between Pietro and his family, and discomforts in Pietro caused by family members' actions. Positive meetings/calls between Pietro and his family are reported as very frequent at T3. Frequency of friendly and positive relationships outside the community are seldom at T1 and T2 and the desire to have friendly and positive relationships outside the community occur frequently in all three times. Instead, the desire to have a romantic relationship is less evident at T2. We can observe the overall efficient personal care in all three times despite the autonomy in his personal care is seldom at T2 and T3. Pietro always attends clinical interviews and follows medication regimen at T3, and requests drug therapy sometimes at T3. The efficiency in money management occurs only sometimes at T3. Emotional and cognitive resources, negative emotions, and some experiences of environmental stress are moderately present at T3. The awareness and understanding of emotions are low at T3. Some behaviors when Pietro experiencing emotions, regulation of emotions effectively and the tendency to have negative secondary emotional responses to one's negative emotions are moderate at T3. Narcissistic features are present at T3 and seem to be in contrast to the self-esteem that is reported as very low at the same time (or T3). Pietro reports a lower level of introspectively ability at T1 than T2 and T3. A very low negative self-perception is reported at T3. Mental representations of other people are moderate in all three times. We can observe a high

TABLE 2 | The Therapeutic project report.

The Therapeutic project report	T1	T2	T3
(A) Homecomings			
Homecoming events	N/A	Sometimes	Always
Desire to return to home	N/A	Sometimes	Often
Negative homecomings	N/A	Seldom	Sometimes
Returns to the community soon after the homecoming are positive	N/A	Seldom	Sometimes
(B) School management			
Motivation to go to school	Missing	Missing	Often
Low academic achievement	Missing	Missing	Often
School attendance	Missing	Missing	Often
Good peer relations	Missing	Missing	Sometimes
(C) Living in the therapeutic community			
Good interactions with educators	Often	Sometimes	Often
Conflictual interpersonal interactions	Sometimes	Sometimes	Sometimes
Proactive behaviors	Seldom	Seldom	Often
(D) Family relationships			
Positive meeting/call to his/her relatives	Often	Always	Often
Presence of family members in the patient's life	Seldom	Sometimes	Sometimes
Negative interactions with the family members	Sometimes	Seldom	Sometimes
Family members causes severe discomforts in the patients	Seldom	Sometimes	Sometimes
(E) Traineeship/work context			
Work motivation	N/A	N/A	N/A
Good academic achievement	N/A	N/A	N/A
Negative relations with his/her coworker	N/A	N/A	N/A
(F) Sociability and interpersonal relations			
Frequency of friendly and positive relationships outside the community	Seldom	Seldom	Sometimes
Desire to have friendly and positive relationships outside the community	Often	Often	Often
(G) Romantic Relationships			
Desire to have a romantic relationship	Often	Seldom	Often
Being in romantic relationship	Never	Never	Missing
(H) Personal Care			
Good personal hygiene	Sometimes	Sometimes	Often
Autonomy in his/her personal care	Sometimes	Seldom	Seldom
Adequate clothing	Often	Sometimes	Often
Clean clothing	Sometimes	Sometimes	Often
(I) Management of his/her physical and mental health			
Attendance at clinical interviews	Often	Often	Always
Adherence to the medication regimen	Often	Often	Always
Request for the drug therapy	Seldom	Sometimes	Seldom

(Continued)

TABLE 2 | Continued

The Therapeutic project report	T1	T2	T3
(L) Money management			
Efficient and adequate money management	Missing	Often	Sometimes
(M) Ability to control impulsive behaviors			
Level of emotional and cognitive resources	Moderate	Low	Moderate
Negative emotions	Moderate	High	Moderate
Experiences of environmental stress	Low	Low	Moderate
(N) Affectivity			
Awareness and understanding of emotions	Moderate	Low	Low
Behavior when experiencing emotions	Moderate	High	Moderate
Regulation of emotions effectively	Moderate	High	Moderate
Tendency to have negative secondary emotional responses to one's negative emotions	Low	Moderate	Moderate
(O) Self—perception and Interpersonal relationships			
Level of introspective ability	Very low	Low	Low
Narcissistic features	Moderate	High	High
Negative self- perceptions	Moderate	High	Moderate
Self-esteem	High	Very low	Very low
Mental representations of other people	Moderate	Moderate	Moderate
Inflexibility in relationships	High	High	Very low
Autonomy in relationships	Very low	Very low	Low
(P) Reality testing			
Efficiency of reality testing	Moderate	Moderate	High

inflexibility in relationships at T1 and T2, while it is very low at T3. The autonomy in relationships is low and very low in the three times, while the efficiency of reality testing is high at T3.

The Clinical Supervision Report

All qualitative information on patient's behaviors and interactions, between clinicians is included in **Table 3**. Table reported information concerning Pietro's interactions with his family, with clinicians and health educators, and peers.

DISCUSSION

The current study aimed to provide a valid contribute for developing specific instruments able to assess the psychological functioning and behavioral changes in adolescent patients of therapeutic communities. Few studies have been conducted to establish how therapeutic communities work to produce positive outcomes, not reporting the description of those tools included in the psychological assessment (12). Behavioral changes are crucial to improve those voluntary behaviors over which the person has at least a degree of control (10,

12). Recovery or improvement thus requires the individual takes active steps to change unhelpful habits or entrenched patterns of behavior. Therefore, the necessity that the TC staff works by using specific and *ad hoc* measures should be considered as a priority. We conducted a single case study using an innovative multimethod assessment including new measures for evaluating psychological features related specific behavioral changes. This multimethod assessment approach may provide useful information on specific psychological dimensions (13–15); also, data and information obtained by these new measures may help clinicians to establish individual treatment approaches.

In structured group activities, Pietro reports a constant attendance but the quality and frequency of his behavior decreases at T3. There is an overall deterioration from T2 to T3. However, staying in the community may lead to daily obstacles that Pietro does not cope: in fact, sometimes he shows aggressive crises at T2, that may represent difficulties in maintaining relationships with others (especially, after some months from the community admission). Relations with his family members are stable, although we can observe a “worsening” in the psychological functioning and well-being at T3, probably subsequently to one or more meetings with his family system. Distress experiences occur intensely only during the meeting between Pietro and his family; differently when Pietro calls his parents arises a situation in which the phone assumes the function like a “wall” protecting Pietro from the impact of family's actions. Also, we can observe a stable attendance in school activities at T3: we can speculate that after the homecomings despite some difficulties, Pietro adheres to the structured context of the community and follows its rules (such as to go to the school constantly). It is noteworthy that the request for pharmacological therapy drastically decreases at T3, probably for the improvement of the awareness related to needs and for the improvement of the capacity in managing several problems. There are also some aspects associated with restless and nervousness. At T3 Pietro shows the desire to return to home but at the same times, we can observe that negative returns occur. Overall, we can note that when interactions are not mediated by “external structured frames” (such as those of the TC), Pietro usually shows no adaptive behaviors. For example—at home with his family—he is absorbed by a “world without rules,” lacking in psychological containment and, therefore, emotion dysregulation and specifically, difficulties in controlling impulses increase sometimes leading to substance abuse and no conventional behaviors. We may infer that there is a difficulty in modulating emotions without an external containment that causes some dissociative components. Pietro reports a disruption and discontinuity in the normal integration of consciousness, identify, emotions, and perceptions. We can speculate on the presence of dissociative features can potentially may disrupt every area of psychological functioning. Pietro seems to experience unbidden intrusions into awareness and behavior, with accompanying losses of continuity in subjective experiences and inability to access information or to control his mental functions that normally are readily amenable to access or control. These aspects, in fact, emerged from that behavior defined as

TABLE 3 | The clinical supervision report.**T1 (from March 2017 to June 2017)**

Pietro's father, currently unemployed, made a serious car accident during which a man died. The car accident caused a serious discomfort in Pietro and represented for him a traumatic event that has worsened relations with his father. Pietro's father is depressed but in the past, he was very aggressive toward his family members. Pietro has an older brother. Both Pietro's father and brother seem to be characterized by detached relationships, emotional unavailability, and psychological immaturity; they are emotionally void and burned without coping strategies able to manage their emotional and psychological needs maintaining negative patterns of behavior due to lack of self-awareness. Pietro's mother seems to use her child to get her emotional needs. The relationship between Pietro and her mother appear to be dependent and entangled; Pietro slept in the same bed with her mother until adolescence. Toward the mother, Pietro shows both aggressive and dependent behavior. When Pietro was 5 years received a diagnosis of intellectual disability characterized by significant limitations in both intellectual functioning and adaptive behavior. He was supported by therapeutic program and subsequently was included in two TCs where he referred to have experienced sexual abuses (sexual abuses were not confirmed by medical examinations). Later, Pietro received the diagnosis of a bipolar disorder because of extreme mood swings including emotional "highs" and "lows." In the community, Pietro shows a proactive behavior and engages in daily activities. He has a good personal care and participates in those activities organized by the community such as sports activities and trips. When interactions are not mediated by "external structured frames" (such as the TC), he usually shows antisocial behaviors and specifically acts characterized by covert and overt hostility and intentional aggression toward others. Overall, significant limitations in both intellectual functioning and in adaptive behaviors contribute to increase difficulties in understanding the demands external to the TC.

T2 (from July 2017 to November 2017)

Initially Pietro tried several times to escape from the community. Especially during this second period, (T2) escapes decreased. Clinicians and health educators believe that relations with the community are becoming stable and productive. During the activities outside the TC, Pietro shows collaborative behaviors. However, when he is in the community with others shows more frequently antisocial and non-adaptive behaviors. In the TC Pietro is described as attention—seeker, showing aggressive crises in order to elicit attention; this type of behavior seems to be associated to primitive and symbiotic relationship with her mother. Clinicians believe that it is essential to accept such "emotive requests" by Pietro in order to move from a condition of *infantile omnipotence* to a *non-omnipotence condition*. The sense of omnipotence arises from the fundamental misapprehension of reality, which is central to the period of primary narcissism, during which the infant hallucinates its original love-object and overestimate the power of wishful thinking. After meeting his family (about once a month), Pietro is described as apparently calm and serene.

T3 (from December 2017 to February 2018)

Pietro's interpersonal relationships continue to be immature. He shows attention-seeking behaviors and does not try to manage his feelings of frustrations especially when others fool with him. He seems to be always looking for male adult figures in which to "mirror" him-self. The "male argument" represents in Peter's life an aspect linked to feelings of fear and anguish. Specifically, the car accident caused by his father contributed to the social isolation of his family. The lacking of a male figure is evident in "looking for male figures" (such as male health educators toward which it seems to show dependence and intrusiveness). Pietro engages in dependent and submissive behaviors that are designed to elicit care-giving behaviors in others. Overall, his dependent and infantile behavior may be considered as being "clingly" or "clinging on" to others. Pietro consistently seems to express to feel abandoned when health educators are not involved in his daily activities- Pietro struggles every day with his emotions and episodic bouts of self-loathing. Pietro shows more difficulties with social adjustment, and report problems with friendships/peers, and manifest behavior problems (especially outside the community). For example, Pietro is a swaggering, in an attempt to satisfy needs of others when attending groups with "swaggering" people. He changes depending on people that are around. However, he seems to accept more than before rules and limitations given by the TC; indeed, he follows rules, structured activities and shows a good daily personal care.

"chameleonic" resulting in a lacking of internalization of rules and mental states of others. His behavior changes drastically according to the different contexts; he alternates his being a "demon" or a "good boy," according to the people around him. Therefore, we can observe a discontinuity in his behaviors every time he returns to the community, after his homecomings. Pietro's behavior is not linear: when the context changes, Pietro modifies drastically his behavior assuming different roles with different temperaments.

CONCLUDING REMARKS

The current study presents some limitations. Some data on Pietro's behavior are missing.

Furthermore, the study provides only qualitative data in order to address clinicians to use specific information able to establish a correct and efficient treatment. Although the most prominent critique of single case study is the issue of external validity or generalizability, our findings may improve the knowledge in understanding the psychological functioning. Therefore, we chose to report a single case study in order

to examine thoroughly that qualitative information related to psychological functioning that could not be obtained through a quantitative—multiple cases study (16). In conclusion, in future it could be useful to add to the aforementioned tools, a *Daily Emotions Logbook* completed by the patient, in order to obtain important information based on the point of view of the patient.

ETHICS STATEMENT

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The protocol was approved by Tiarè—Servizi per la Salute Mentale, Via Berthollet, 44, 10125 Torino, Italy. Project Title: Lo sviluppo di strumenti atti a valutare i cambiamenti del comportamento, nelle comunità terapeutiche. Written informed consent was obtained from the parents of the participant for the study and for the publication of this case report (i.e., The development of instruments to detect

indicators of behavioral changes in therapeutic communities: A clinical case study).

AUTHOR CONTRIBUTIONS

SC conceived and supervised the study and reviewed the manuscript. AA coordinated the study, reviewed

the data, performed the data analysis, and wrote the manuscript. LF helped interpret the data and reviewed the manuscript.

FUNDING

The authors received no specific funding for this work.

REFERENCES

- Pearce S, Autrique M. On the need for randomised trials of therapeutic community approaches. *Ther Commun.* (2010) 31:338–55. Available online at: <http://hdl.handle.net/1854/LU-2028304>
- De Leon G. The therapeutic community: status and evolution. *Int J Addict.* (1985) 20:823–44. doi: 10.3109/10826088509047755
- De Leon G. The therapeutic community and behavioral science. *Int J Addict.* (2009) 25:1537–57. doi: 10.3109/10826089009088559
- O'Sullivan J, Paget S. *The Service Standards for Therapeutic Communities for Children and Young People*. 2nd Edn. London: Royal College of Psychiatrists (2009).
- Palareti L, Berti C. Relational climate and effectiveness of residential care: adolescent perspectives. *J Prevent Interv Commun.* (2010) 38:26–40. doi: 10.1080/10852350903393426
- Huefner JC, Pick RM, Smith GL, Stevens AL, Mason A. Parental involvement in residential care: distance, frequency of contact, and youth outcomes. *J Child Fam Stud.* (2014) 24:1481–9. doi: 10.1007/s10826-014-9953-0
- Stucky BD, Edelen MO, Vaughan CA, Tucker JS, Butler J. The psychometric development and initial validation of the DCI-A short form for adolescent therapeutic community treatment process. *J Subst Abus Treat.* (2014) 46:516–21. doi: 10.1016/j.jsat.2013.12.005
- McEvoy PM, Nathan P, Norton PJ. Efficacy of transdiagnostic treatments: a review of published outcome studies and future research directions. *J Cogn Psychother.* (2009) 23:20–33. doi: 10.1891/0889-8391.23.1.20
- Pearce S, Haigh, R. Mini therapeutic communities – a new development in the United Kingdom. *Ther Commun.* (2008) 29:111–24.
- Pearce S, Pickard H. How therapeutic communities work: specific factors related to positive outcome. *Int J Soc Psychiatry.* (2013) 59:636–45. doi: 10.1177/0020764012450992
- Abrishami GF, Warren JS. Therapeutic alliance and outcomes in children and adolescents served in a community mental health system. *J Child Adolesc Behav.* (2013) 1:2. doi: 10.4172/2375-4494.1000110
- Hair HJ. Outcomes for children and adolescents after residential treatment: a review of research from 1993 to 2003. *J Child Fam Stud.* (2005) 14:551–75. doi: 10.1007/s10826-005-7188-9
- Ando' A, Salatino A, Giromini L, Ricci R, Pignolo C, Cristofanelli S, et al. Embodied simulation and ambiguous stimuli: the role of the mirror neuron system. *Brain Res.* (2015) 1629:135–42. doi: 10.1016/j.brainres.2015.10.025
- Giromini L, Ando' A*, Morese R, Salatino A, Di Girolamo M, Viglione DJ, et al. Rorschach Performance Assessment System (R-PAS) and vulnerability to stress: a preliminary study on electrodermal activity during stress. *Psych Res.* (2016) 246:166–72. doi: 10.1016/j.psychres.2016.09.036
- Bornstein RF. Toward a process-focused model of test score validity: improving psychological assessment in science and practice. *Psychol Assess.* (2011) 23:532–44. doi: 10.1037/a0022402
- Ando' A, Pignolo C, Viglione DJ, Zennaro A, Cristofanelli S, Ferro L. Assessing the personality profile with ADHD characteristics using the rorschach performance assessment system (R-PAS). *J Child Fam Stud.* (2019) 28:1196–206. doi: 10.1007/s10826-019-01359-y

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Cristofanelli, Ando' and Ferro. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



Effectiveness of Brief Psychodynamic Therapy With Children and Adolescents: An Outcome Study

OPEN ACCESS

Edited by:

Jian-Bin Li,
The Education University of
Hong Kong, Hong Kong

Reviewed by:

Chris Fradkin,
Pontifical Catholic University of Rio de
Janeiro, Brazil
Meghana M. Kamble,
University of East Anglia,
United Kingdom

*Correspondence:

Michela Gatta
michela.gatta@unipd.it

†Present address:

Manuela Difronzo,
Association of Child Psychotherapists,
London, United Kingdom;
Independent Psychoanalytic Child and
Adolescent Psychotherapy
Association, London, United Kingdom

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Pediatrics

Received: 02 May 2018

Accepted: 19 November 2019

Published: 20 December 2019

Citation:

Gatta M, Miscioscia M, Svanellini L,
Spoto A, Difronzo M, de Sauma M
and Ferruzza E (2019) Effectiveness of
Brief Psychodynamic Therapy With
Children and Adolescents: An
Outcome Study. *Front. Pediatr.* 7:501.
doi: 10.3389/fped.2019.00501

Michela Gatta^{1*}, Marina Miscioscia^{1,2}, Lorenza Svanellini¹, Andrea Spoto³,
Manuela Difronzo^{4†}, Maxim de Sauma⁴ and Emilia Ferruzza²

¹ Department of Women's and Children's Health, University of Padua, Padua, Italy, ² Department of Developmental Psychology and Socialization, University of Padua, Padua, Italy, ³ Department of General Psychology, University of Padua, Padua, Italy, ⁴ Brent Centre for Young People, London, United Kingdom

Studies on the effectiveness of child and adolescent psychotherapy treatments provided by the Italian National Health Service lag behind, while the scientific community has rather focused on the value of cognitive-behavioral psychotherapeutic approaches. This paper evaluates the effectiveness of a one year psychodynamically-oriented intervention with children and adolescents—aged between 6 and 18 years ($M = 12.08$, $SD = 3.7$)—and their parents, carried out in a Child and Adolescent Neuropsychiatric Service (SCIAF), part of the Italian National Health System. Following a psychodiagnostic assessment, two types of therapeutic intervention were offered: children and adolescents allocated to Group 1 ($N = 26$) were offered individual psychodynamic psychotherapy alone, whilst youths in Group 2 ($N = 31$) were offered individual psychotherapy, accompanied by parental support. This study examines the effects of this time-limited (12 month) psychodynamically-oriented psychotherapy in terms of improvements in patients' symptoms (measured on the Achenbach's questionnaires: *Child Behavior Checklist* and *Youth Self-Report 11-18*). This study also examines the effects of treatment on parents' perception of their family empowerment. This domain is measured on the *Family Empowerment Scale* (FES). Our findings seem to be partly in line with published studies according to which poor parenting (i.e., characterized by lack of warmth, a rigid and/or negative parenting style, poor monitoring of the children, etc.) would be positively associated with Externalizing problems in childhood. Our preliminary findings suggest that brief psychodynamic therapy seemed to show positive outcomes in both "Internalizing" and "Externalizing" difficulties, accounting for age-related differences, ICD-10 (1) diagnoses, and the types of treatment offered. However, no statistically significant changes were detected in the parents' perceptions of empowerment at 12 months.

Keywords: psychodynamic psychotherapy, brief psychotherapy, developmental psychopathology, outcome study, parental support

THEORETICAL BACKGROUND

Psychodynamic psychotherapy focuses specifically on the interactions between the mental processes generated by the person's subjective experiences and the behavior at the onset of such problems (2).

One of its aims is to strengthen the patient's capacity to understand the reasons for their subjective experiences and their underlying meanings, their relationships, and their own and others' behavior (2). The therapist tries to improve the patient's awareness of such unconscious mechanisms and influential factors, and to promote their capacity to tackle overwhelming anxieties and pressures within these relationships (2).

Mental health services are increasingly being asked to provide short-term or time-limited psychodynamic psychotherapies (3). Several models, such as mentalization-based therapy [MBT (4)], dynamic interpersonal therapy [DIT (5)], short-term psychodynamic psychotherapy (6, 7) are now being used in various services.

Short-term psychodynamic psychotherapy, although quite unstructured in its approach, follows some principles (8) to try and draw out a basic understanding of the ongoing determinants of a patient's reported difficulties, crisis or breakdown; overall, it does not seem to primarily focus on the client's past; it rather prioritizes a better understanding of the client's present and current difficulties. Exploration of early years and early relationships is not an aim of this work; however, it can be made use of to identify how some of the clients' difficulties unfold in the "here and now" of the patient's daily life and relationships.

Typical goals of these therapies may include, i.e., reducing the patient's general symptoms: the therapist helps the client to reflect on identified difficulties in the patient's external reality (8). This may give way to the exploration of deeper dynamics and experiences, with the aim of improving the patient's resilience. Short-term psychoanalytical models [e.g., (9)] and short-lived psychodynamically-oriented treatments tend to focus first on the more urgent and important conflicts, unraveling the reasons as to why the patient sought a consultation. These conflicts are regarded as "focal" or "central" conflicts.

Brief psychodynamic therapies usually last between 20 and 40 sessions. Such treatments typically comprise three main stages: a beginning, a middle phase, and an end. Their treatment length can vary and can range between the higher and lower end of the continuum with regards to number of sessions offered. Brief psychodynamic therapies differ significantly from the classic psychoanalytical model, whereby an open-ended and more intensive psychoanalytic work is provided.

One feature that seems to further distinguish short-to-medium-term psychodynamic psychotherapies from more classic psychoanalytical treatments regards the use of transference, regarded as the process by which unconscious feelings and fantasies are transferred to the analyst (10). In brief psychodynamic treatments, this may be more diluted or made use of differently and less intensely than in more intensive therapies. That said, therapists may make use of their understanding of transference dynamics to work on the reason(s) for their patient's referral and the pattern(s) of their

behavior and emotional responses (8, 11). Brief psychodynamic psychotherapy may not treat deeper anxieties or dynamics in the history of patients or their parents. The focus of short-term psychodynamic psychotherapy is rather confined to the "main anxiety," and to the problem(s) that led the individual to seek therapeutic help, which may be a specific symptom or a specific relational dynamic.

The therapist holds important responsibilities about treatment planning, bearing in mind that its duration can be flexible, but can't be endless (8).

It is essential to plan the stages of treatment, if possible. In order to be able to do so, the therapist should preferably gain a good preliminary understanding of the patient's history right from their first meetings. Sometimes, an extended assessment is required in order to achieve a deeper level of understanding of the client's presentation.

Overall, there seem to be fewer published studies that focus on the effectiveness of psychodynamic psychotherapy with children and adolescents compared to the existing body of research focusing on the efficacy of cognitive-behavioral treatment approaches (12–14). However, more recently, an increasing demand for evidence-based treatments, outcome and process research, has triggered an interest in the way brief psychodynamic psychotherapies for children and young people operate (9).

The literature highlights how play therapy and psychodynamic therapy (15) can be effective for a broad array of psychological problems in children, including emotional and behavioral issues, post-traumatic disorders, and family and social problems (16). Recent studies have shown how beneficial psychodynamic therapy can be for young people, with improvements that typically persist after the end of the therapy (17, 18). However, the widely-perceived difficulties of engaging adolescents in psychotherapeutic work (i.e., high rates of adolescents' dropout, etc.) may have hindered the development of adolescent-focused models of time-limited therapy (19). Muratori et al. (20) examined the short- and long-term effects of time-limited psychodynamic psychotherapy for children with Internalizing disorders. They found the therapy useful on Internalizing symptoms in both the short and the long term, thanks to its sleeper effect (with a delayed onset). A review by Abbass et al. (21) generated encouraging results, and the authors concluded that psychodynamic psychotherapy is effective with adolescents. Based on studies that analyzed data recorded by means of well-validated symptom checklists, the authors found that, in all areas of interest, except for somatic symptoms, patients benefited significantly from the treatment by comparison with control groups, in both the short and medium term (21).

Family characteristics are significant predictors of a child's mental health; the emotional climate (family warmth), the family structure and its organization are regarded as having an impact or being associated with outcomes in children's psychotherapy treatments (22, 23).

Alongside an individual child psychodynamic and/or psychoanalytic psychotherapy, an area of good practice includes sessions of parallel parent work (24); furthermore the existing

literature highlights how helpful and relevant it is to establish a good relationship with the family to promote the child's development, as highlighted by a number of authors (25–31).

Psychotherapy work with parents can influence the child's outcomes, when in treatment (32). High-quality, effective parenting support, and interventions have shown supportive of the psychotherapy process, by reducing the high prevalence of the emotional and behavioral problems among youth after treatment (33). It is estimated that children and young people present with higher risks of treatment drop-out as well as it is estimated that their family functioning is affected when the client's individual therapy is not associated to parallel parent work (34).

This study wishes to contribute to the existing body of literature evaluating the level of effectiveness of psychodynamic psychotherapies on symptoms' reduction of children and young people and on the level of family empowerment in two conditions (depending on whether the parents were offered parallel sessions or not).

Aims

This outcome study, conducted in 2016 (from January to December), focused on evaluating the effectiveness of 1 year psychodynamic psychotherapy with children and adolescents. It was also aimed to assess whether there were different outcomes depending on whether parallel parents' sessions had been offered. It is important to emphasize that the present work is part of a broader, longitudinal study, conducted in the Child and Adolescent Neuropsychiatric Service, provided by the Italian National Health Service at a Local Mental Health Unit (ULSS 6) in Padua (PD, Italy). Aim of this present work was to use public resources to provide psychodiagnostic and therapeutic interventions in clinical practice, with the goal of identifying the most suitable psychotherapies for our service users. The study follows the official standards of clinical practice and research, as adopted by the scientific community, to improve the efficacy and effectiveness of psychotherapy for children and adolescents in mental health services. This research was conducted despite the challenges dictated by cuts to fundings for mental health Services in Italy.

The present project (approved by the local ethical committee—CEP 204 SC) was based on the above-mentioned premises, giving important consideration to the family household during the process of a patient's referral into the Service. The therapeutic approach involving the parents in the treatment considers the family as a structured subsystem and a composite set of different functions and roles, amongst which the roles of parenting, co-parenting, etc (35, 36).

Specifically, we examined: (a) the effectiveness of individual psychotherapy (with or without parallel work for their parents) on the children and adolescents' symptoms at the end of the therapy; (b) the relationship between the participants' individual psychotherapy (with or without parallel work for their parents) and the parents' perceptions of their parental empowerment.

We hoped to observe an improvement of the patient's symptomatology at the end of the therapy that would confirm the effectiveness of this mode of short-term psychodynamic psychotherapy with this population (37). Furthermore, we

hypothesized that the child or adolescent's symptoms' reduction may also be associated with parents' perceptions of their parental empowerment.

MATERIALS AND METHODS

Participants

The sample consisted of 57 families (each of them including one minor with two parents), who were referred to the Service during the course of 2016. The children and adolescents taking part in the study included 30 males and 27 females, aged between 6 and 18 years ($M = 12.08$, $SD = 3.7$). The wide age-range is justified by the nature of our clinical service, which accepts referrals to neuropsychiatric and psychotherapy services for both children and adolescents.

The sample was divided in two groups depending on the treatment offered, based on the participants' clinical condition and their carers' parenting skills: Group 1 (G1) included 26 participants (children and adolescents) who were offered individual therapy; and Group 2 (G2) consisted of 31 children and adolescents who received individual therapy, whose parents also received support alongside their child's psychotherapy.

Participants were assigned to one or the other group depending on the result of their assessment: if poor parenting/coparenting skills were found in addition to the client's psychopathology, the family was assigned to Group 2 (psychotherapy for the child/adolescent associated with parental support).

Each patient received a diagnosis on the ICD-10 (1). Depending on their ICD-10 diagnosis, participants were allocated to one of three macrocategories (see **Figure 1**): Psychoses and Developmental Disorders (1); Emotional Disorders (2); or Behavioral and Personality Disorders (3).

Category 1 (17%)—Psychoses and Developmental Disorders—involved: (F10–F19) Mental and behavioral disorders due to psychoactive substance use; (F80–F89) Disorders of psychological development.

Category 2 (44%)—Emotional Disorders—included: (F30–F39) Mood [affective] disorders; (F40–F48) Neurotic, stress-related and somatic disorders.

Category 3 (39%)—Mental and behavioral disorders—concerned: Personality Disorders (F60–F69) and Behavioral and emotional disorders with onset usually occurring in childhood and adolescence (F90–F98).

Procedure

Our sample was recruited following an assessment with the children/adolescents and their parents. This assessment took place over a few meetings and interviews, depending on the need. Interviews were led and conducted by a developmental neuropsychiatrist and a trained psychodynamic psychologist. As part of the process, written consent for the child's therapy was sought at the time of referral. Parents also provided valid written consent for the use of video/audio recordings obtained during the sessions for research purposes.

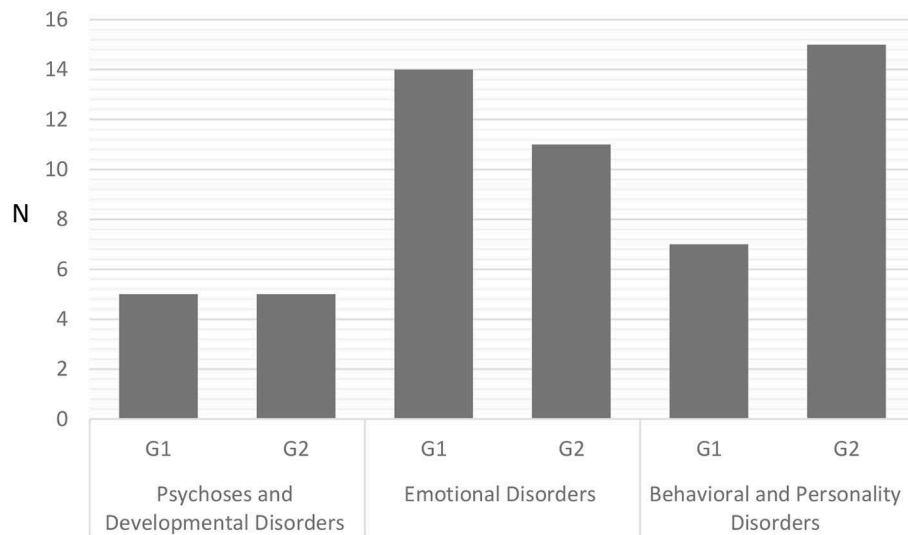


FIGURE 1 | Number of participants in the three diagnostic categories and two groups. G1, Individual psychodynamic psychotherapy for child/adolescent; G2, Individual psychodynamic psychotherapy for child/adolescent and Co-parental support.

The assessment procedure for the recruitment of our sample is outlined below.

- i. A first meeting was organized between the neuropsychiatrist and the child/adolescent, aimed to assess the patient's suitability for therapeutic intervention and/or psychiatric care. Following the above, two clinical interviews were conducted, and the child/young person was given a battery of tests; the Youth Self Report, YSR (38), was used at this stage of the assessment process. Then, a final feedback interview was conducted to inform the client and/or their parents of the ICD-10 diagnosis and discuss therapeutic recommendations.
- ii. On a parallel level, the psychologist met separately with the parents. Subsequently, parents met the neuropsychiatrist, after which two clinical interviews were organized. The CBCL (Child Behavior Checklist) and the FES (Family Empowerment Scale) were administered at this stage of the process. Then, a final interview (which follows, in the next paragraph) provided feedback to the parents and their child.
- iii. The final session, which involved the whole family, was organized and led by two professionals.

At this point of the assessment process, families were asked if they were willing to take part in this research project, following which a separate research consent form was signed. Our exclusion criteria for the present sample concerned a disability or an IQ <70, tested during the neuropsychological assessment using the WISC-III and/or WPPSI-III (39, 40).

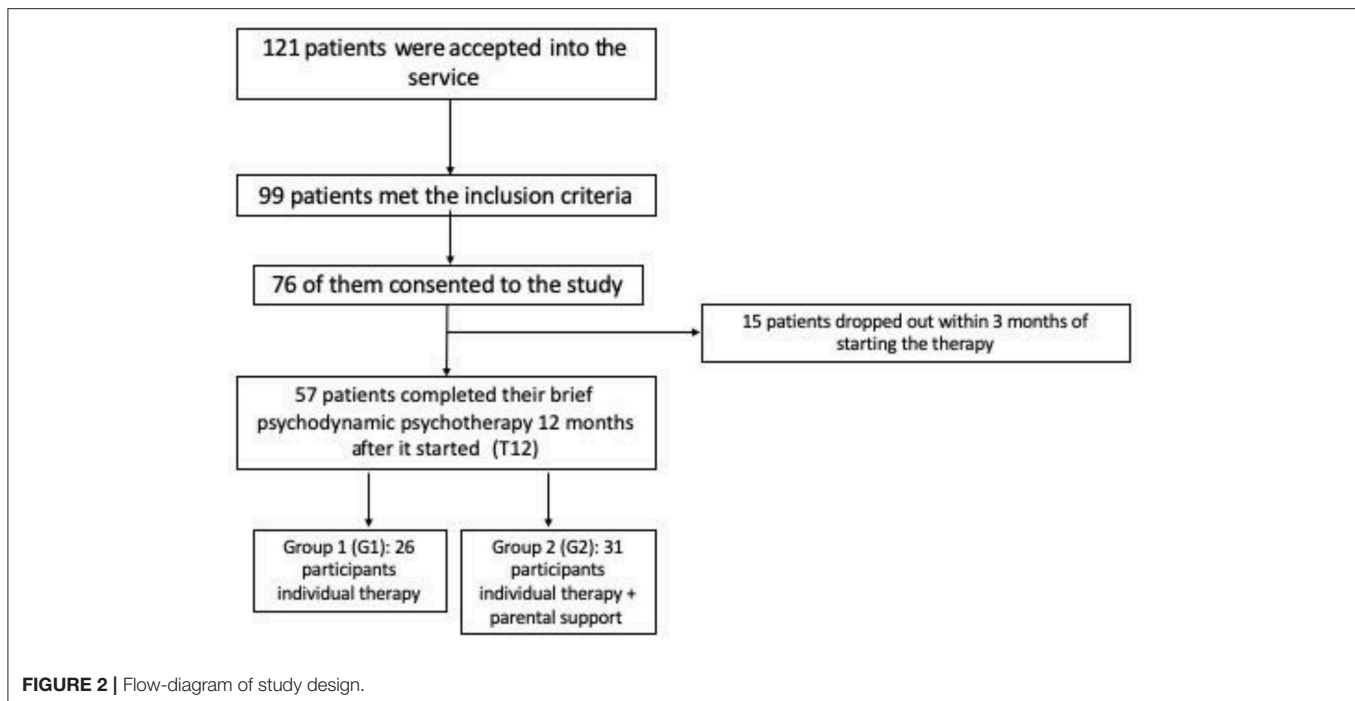
Study Design

This study was an outcome research. The sample was divided in two groups depending on treatment: one (Group 1) received 40 (weekly or fortnightly) sessions of individual Short-Term

Psychodynamic Psychotherapy; the other (Group 2) received the same amount of individual Short-Term Psychodynamic Psychotherapy for the child with 20 (fortnightly or once/month) parallel parent sessions. The Short-Term Psychodynamic Psychotherapy in use is a time-limited psychodynamic psychotherapy that focuses on working through core problems and conflicts, also providing symptom relief [cfr. (41)]. This psychotherapeutic model is based on some key principles: (a) attention to the client-therapist relationship; (b) the therapist has an active role during treatment; (c) identification of a specific problem; (d) therapies have a time-limit and a fixed number of sessions.

Parent work was often helpful, considering the level of risk of the young person. It was conducted by a different therapist to the one working clinically with the child/young person; this is in keeping with studies confirming that families affected by multiple problems benefit greatly when parental support is offered alongside individual psychotherapy (42). The work with parents lasted for 12 months, and focused on three important areas, as suggested by Piovano (43): (a) the couple's relational triangulation; (b) the triangulation introduced by the child; and (c) the development of sufficiently good parenting functions. Therapists met periodically for supervision, to discuss cases and share therapeutic objectives.

Out of 141 referrals, 121 patients were accepted into the service; 99 of them met our inclusion criteria, and 76 consented to the study. Fifty-seven patients completed their brief psychodynamic psychotherapy 12 months after it started, while 19 did not attend (15 dropped out within 3 months of starting the therapy because they reported they no longer needed treatment, 2 chose another service, and 2 moved out of area) (see Figure 2).



Instruments

Child Behavior Checklist (CBCL) and Youth Self Report (YSR) [(38); It. Tr. (44)]

These well-validated questionnaires are adopted worldwide and are commonly used to assess behavioral and emotional difficulties in children and young people. Children's parents completed the CBCL, and—for the present study—both parents were asked to answer the questionnaire jointly, considering the last 6 months of their child's life. The YSR was administered to adolescents between 11 and 18 years of age.

Raw answers to the questionnaires were scored using the computer-based Assessment Data Manager (ADM) program, part of the Achenbach System for Empirically-Based Assessments (ASEBA)[®] (38), which produces a clinical profile in the form of a set of scales referring to specific symptom domains. These domains identify the following syndromes: anxiety/depression, withdrawn behavior, somatic complaints, social problems, thought problems, attention problems, aggressive behavior, and rule-breaking behavior. A further area of the profile illustrates three clusters of issues, identifiable as: Internalizing, Externalizing and Total Problems. Internalizing problems include anxiety/depression, withdrawn behavior and somatic complaints. Externalizing problems involve aggressive behavior and rule-breaking behavior. Total Problems are a combination of both Internalizing and Externalizing Problems, and any Other problems, such as tics, suicidal ideation, pica, weight-related problems, speech problems, etc.

For the present study, only the three main clusters were considered, i.e., Internalizing, Externalizing and Total Problems. Scores obtained on these scales were rated in terms of their clinical severity as non-clinical, borderline, or clinical, using cut-offs: scores of 64 or more were regarded as “clinical,”

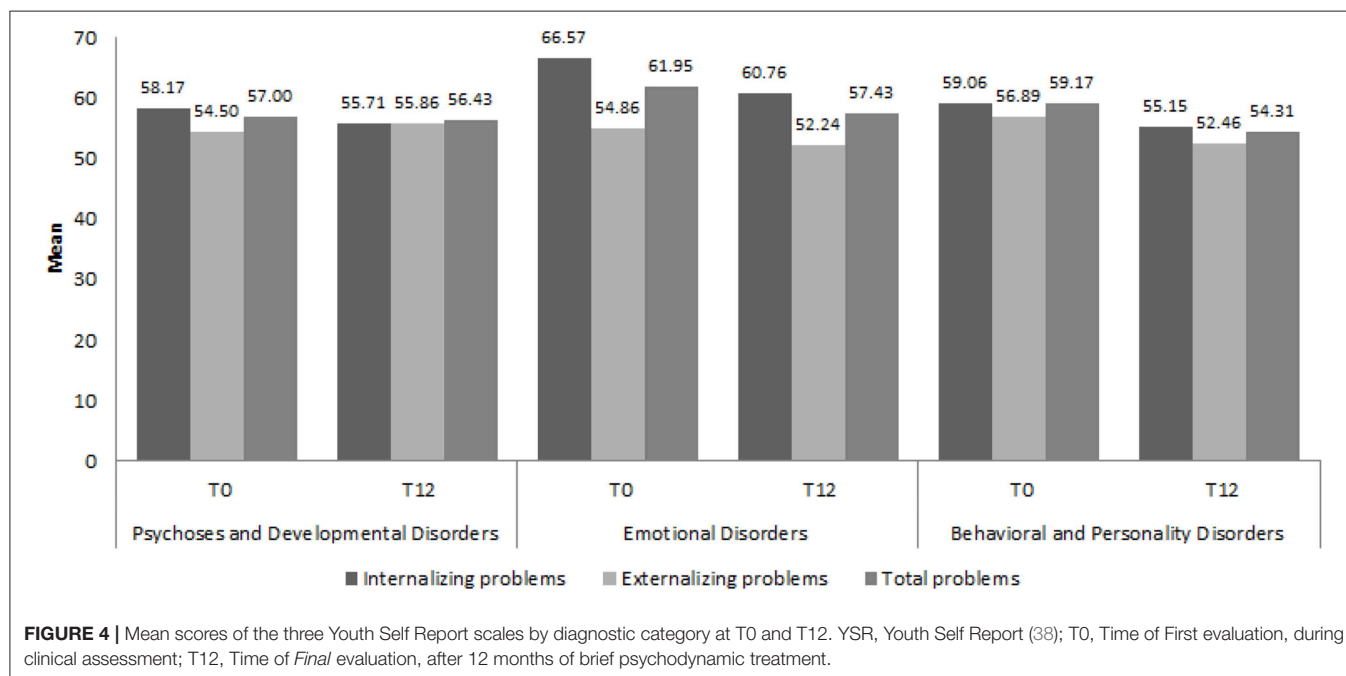
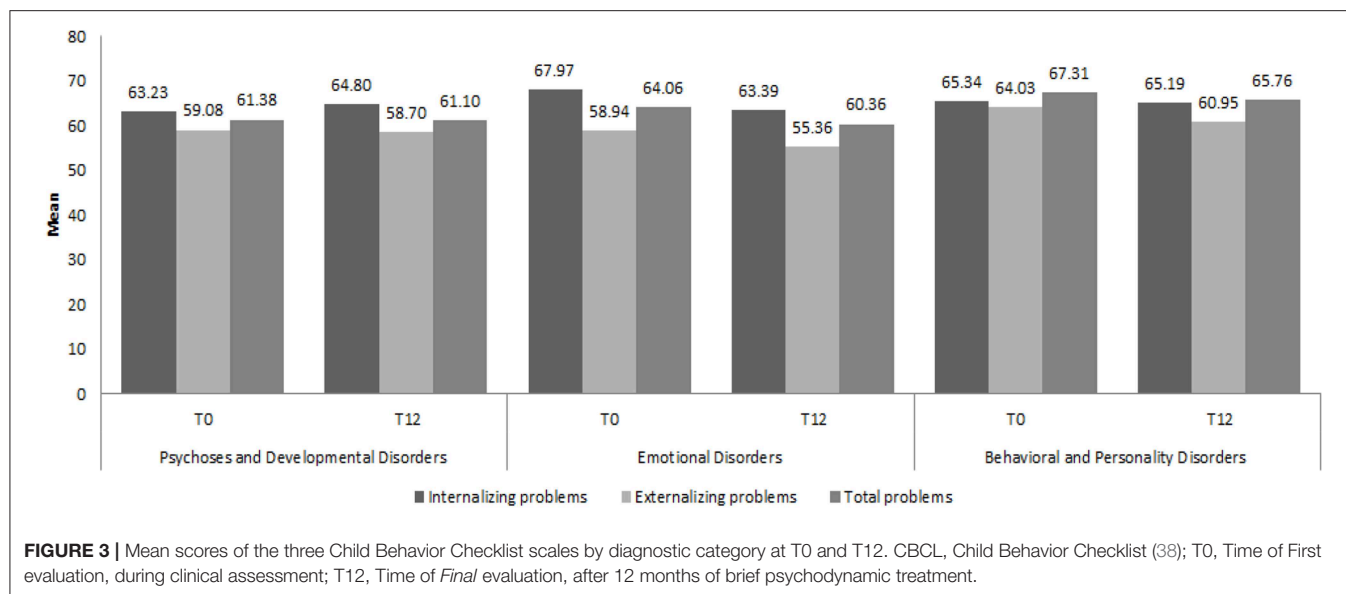
scores between 60 and 63 as “borderline,” and scores of 59 or less as “non-clinical.” Several studies confirmed the reliability and validity of the Italian versions of both CBCL and YSR (45, 46). In particular Frigerio et al. (44) observed very-good Cronbach α coefficients in CBCL scales ranging from 0.83 to 0.91.

Family Empowerment Scale [FES- (47)]

This is a brief questionnaire designed to assess family members' perceptions of empowerment. The 34 items on the FES tap into two dimensions of family empowerment: level of empowerment (family, service system, community/political); and how empowerment is expressed (attitudes, knowledge, behavior). Given the focus of our study, only the family subscale (12 items) referring to parents' management of everyday situations was used. Answers are given on a Likert scale and range from “never” (1) to “very often” (5). Total scores range from 12 to 60, and there is no cut-off. The Italian version shows very good reliability reporting a McDonald's ω of 0.846 and 0.832 for Mothers' and Fathers' sub-scales, respectively.

The use of this indicator of internal consistency is in line with recent literature about the critical aspects related to the use of Cronbach's α [e.g., (48)]. McDonald's ω appears to be a more appropriate index of the extent to which the items of a test measure the same latent variable [e.g., (49–51)]. The values of this coefficient are interpreted similarly to those of Cronbach's α , but they are not affected by the same weaknesses.

Questionnaires CBCL and YSR were part of the current clinical practice; they were administered before and after the psychotherapy. The FES has been identified for research intent.



Statistical Analysis

All the analyses were conducted using “JASP 0.9” software (52), along with descriptive statistics aiming to provide a clearer picture of the sample. In order to test our research questions, several mixed model ANOVAs were run with repeated measures: to test *time* as a “within factor” (2 levels: T0 and T12 after 1 year of treatment) and to test the *type of treatment* as a “between factor” (2 levels: individual psychotherapy for the child vs. individual psychotherapy for the child combined with parallel parent sessions).

RESULTS

Child/Adolescent Psychopathology

Figures 3, 4 show the distribution of the mean CBCL and YSR scores, respectively, for Internalizing, Externalizing and Total Problems at T0 and T12, by diagnostic category.

The mixed model ANOVA on the main scores on the CBCL highlighted a significant effect of both therapies in reducing the severity of the problems in all the investigated areas. The main effect of the within factor “Time” was significant for the three subscales Internalizing Problems [$F_{(1,55)} = 12.142$; $p \leq 0.001$,

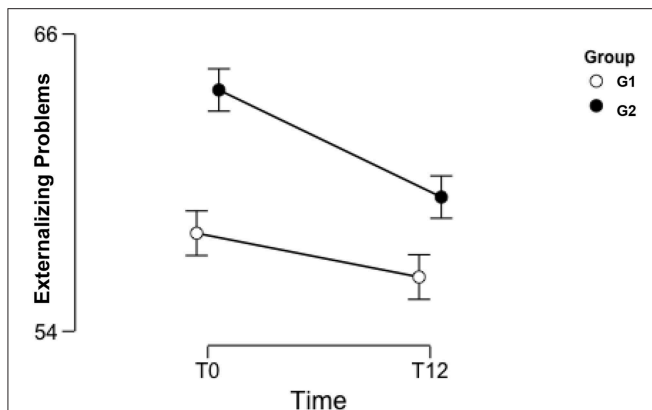


FIGURE 5 | Mean of Child Behavior Checklist scores for Externalizing Problems in G1 and G2 at T0 and T12. CBCL, Child Behavior Checklist (38); T0, Time of First evaluation, during clinical assessment; T12, Time of Final evaluation, after 12 months of brief psychodynamic treatment. G1, Individual psychodynamic psychotherapy for child/adolescent; G2, Individual psychodynamic psychotherapy for child/adolescent and Co-parental support.

$\eta^2 = 0.177$], Externalizing Problems [$F_{(1,55)} = 11.959$; $p \leq 0.001$, $\eta^2 = 0.173$], and Total Problems [$F_{(1,55)} = 20.144$; $p \leq 0.001$, $\eta^2 = 0.265$]. None of the interactions between the two factors were significant, indicating a substantially equivalent effect of the different therapies over time. The main effect of the factor “Group” was significant only with respect to the Externalizing Problems scale [$F_{(1,55)} = 4.018$; $p = 0.05$, $\eta^2 = 0.068$]. This last result suggests that participants in G1 significantly differed from participants in G2 concerning the level of their Externalizing problems throughout the observation period (see **Figure 5**).

Table 1 (below) shows the two groups’ mean scores for Internalizing, Externalizing and Total Problems at T0 and T12. It is worth noticing that, for Externalizing Problems, the mean score for G1 at T0 is in the non-clinical range, while, for G2, this is in the clinical range. All the other pairs of measures were both within the same range for severity.

A smaller group of adolescent patients (between 11 and 18 years old) completed the YSR 11–18 at T0 and T12. **Table 2** shows a descriptive analysis of the three YSR scales for Internalizing, Externalizing and Total Problems for Groups 1 and 2 at the two time points.

The results of the ANOVA showed a significant change in YSR scores between T0 and T12 with regards to the Internalizing Problems [$F_{(1,55)} = 11.580$; $p = 0.002$, $\eta^2 = 0.255$] and the Total Problems [$F_{(1,55)} = 7.551$; $p = 0.010$, $\eta^2 = 0.186$] scales. No effect of the between factor emerged, indicating that there were no significant differences between the two treatment groups. None of the interactions between the two factors reached significance, indicating a substantially homogeneous trend over time in the reduction of the problems in both groups.

Family Empowerment

Table 3 shows mothers and fathers’ scores on the FES, for both groups. The results revealed no statistically significant change in

the sample’s perception of sense of empowerment between T0 and T12.

DISCUSSION

This outcome study yielded some preliminary and non-generalizable findings on the effects of this time-limited psychodynamic psychotherapy with a population of young people aged 6–18, sampled in a local Mental Health Unit in Northern Italy. This study gave us the opportunity to examine the area of presenting symptoms before and after therapy, in two groups, when parents received vs. did not receive therapeutic support on a fortnightly basis. Measures of the effects of treatment were the levels of reported symptoms by the patients and their parents and the level of parents’ perception of the family empowerment.

Statistical analyses showed significant reductions in the CBCL scores in the areas of Internalizing, Externalizing and Total Problems at T12, compared to T0; the YSR scores also showed improvements in the areas of Internalizing and Total Problems as reported by the patients.

Despite the initially encouraging results of this 1 year-long outcome study, one may have to tread carefully with their interpretation.

Prior to starting therapy, at baseline, Group 2 revealed a more severe clinical profile than Group 1 in the area of Externalizing Problems (i.e., aggressive behavior, oppositional and conduct disorders etc.), as shown by the results obtained on the Achenbach’s questionnaires, CBCL and YSR 11–18. The offer of parent work was motivated by their clinical presentation at the moment of referral, with some families presenting with difficulties in their parenting. Although we are not bound to know exactly what the relationship between parenting difficulties and the presence of Externalizing symptoms in children and youth may be, it may be possible that poor parenting (i.e., characterized by lack of warmth, rigid and/or negative parenting style, poor monitoring of the children, etc.) is directly associated with Externalizing problems in childhood.

After 12 months of treatment, the scores obtained by Group 2 in Externalizing symptoms (on both the CBCL and the YSR) showed a statistically significant clinical improvement, which is encouraging; however, because of the presence of a statistically significant difference at baseline between the two groups in the area of Externalizing Problems, results are not immediately comparable in this area because the two groups did not present with similar levels of Externalizing difficulties at the onset and throughout the treatment.

Our findings also seem to highlight that, with this population, brief psychodynamic therapy seemed to be effective on symptoms’ reduction with regards to Internalizing symptoms, as reported by the clients and their parents. It is appreciated in literature that psychodynamically-oriented therapies seem to be most effective with children and young people affected by Internalizing difficulties. It is possible that children and young people presenting with internalizing difficulties improve their insight about their difficulties thanks to being in treatment

TABLE 1 | Mean scores of the three Child Behavior Checklist scales for each group at T0 and T12.

Time	Group	Internalizing problems		Externalizing problems		Total problems		Participants
		Mean	SD	Mean	SD	Mean	SD	N
T0	G1	68.38	6.940	57.96	9.327	65.31	8.054	26
	G2	67.16	7.975	63.74	8.862	66.71	7.230	31
T12	G1	66.23	9.132	56.19	8.859	62.38	9.113	26
	G2	62.58	9.284	59.42	9.248	62.35	9.496	31

CBCL, Child Behavior Checklist (38); T0, Time of First evaluation, during clinical assessment; T12, Time of Final evaluation, after 12 months of brief psychodynamic treatment. G1, Individual psychodynamic psychotherapy for child/adolescent; G2, Individual psychodynamic psychotherapy for child/adolescent and Co-parental support.

TABLE 2 | Mean scores of the three Youth Self Report scales for each group at T0 and T12.

Time	Group	Internalizing problems		Externalizing problems		Total problems		Participants
		Mean	SD	Mean	SD	Mean	SD	N
T0	G1	64.56	10.94	52.25	10.529	59.88	11.581	16
	G2	61.84	10.77	56.47	9.518	60.32	9.855	19
T12	G1	58.94	12.43	52.31	11.359	57.06	12.124	16
	G2	58.58	10.55	53.84	9.895	56.58	9.963	19

YSR, Youth Self Report (17); T0, Time of First evaluation, during clinical assessment; T12, Time of Final evaluation, after 12 months of brief psychodynamic treatment. G1, Individual psychodynamic psychotherapy for child/adolescent; G2, Individual psychodynamic psychotherapy for child/adolescent and Co-parental support.

TABLE 3 | Mean scores and Standard deviation of the Family Empowerment Scale for both parents of participants in G1 and G2.

Time	Group	FES mothers		FES fathers		Participants
		Mean	SD	Mean	SD	N
T0	G1	44.25	5.290	44.33	4.419	20
	G2	43.67	6.983	42.20	4.950	27
T12	G1	44.40	4.672	43.33	5.367	20
	G2	44.63	5.603	43.16	5.632	27

FES, Family Empowerment Scale (47); T0, Time of First evaluation, during clinical assessment; T12, Time of Final evaluation, after 12 months of brief psychodynamic treatment. G1, Individual psychodynamic psychotherapy for child/adolescent; G2, Individual psychodynamic psychotherapy for child/adolescent and Co-parental support.

(18). Further studies could investigate which internal or psychotherapeutic processes occur and facilitate this growing capacity in children and adolescents, in order to evaluate what works best and for whom (53).

The psychodynamic approach to therapy enhances exploration and reflection on the client's emotional sphere, their affects and thoughts. The literature seems to highlight that time-limited psychodynamic psychotherapies are less effective on Externalizing symptoms and it may be possible that different, multimodal approaches (54–57) or mixed treatment approaches—including cognitive-behavioral techniques—are needed with this array of difficulties from the onset of treatment (58, 59).

Further, working clinically with parents requires a high level of experience and presents with major challenges: parents often require both emotional containment and practical advice on how to manage their child's behaviors and may need more time to improve their relationship with their children/adolescents depending on their internal and interpersonal resources. An

added layer of complexity while working clinically with young people and their parents in this study was represented by the variety of ICD-10 diagnostic categories of this sample. Our findings seemed to point toward positive changes and outcomes in the CBCL and YSR scores of children and young people affected by “Emotional Disorders” and “Behavioral and Personality Disorders,” whilst no positive changes were evaluated on questionnaires in the “Psychoses and Developmental Disorders” category.

Our results seem to partly support the hypothesis according to which psychodynamic psychotherapy might not be as effective as other approaches in treating such disorders, whereas it constitutes an eligible treatment for depression, anxiety, eating disorders, somatic, and personality disorders (60). With these regards, a study by Gonzalez (61) evaluated that psychodynamic psychotherapy seemed to be effective only on the depressive symptoms of clients affected by bipolar disorder.

Furthermore, our results showed a discrepancy between the rates of Internalizing problems (expressed in percentages) as reported by parents and as reported by their children: the YSR scores suggested higher rates of Internalizing Problems at Time 0 (35%) compared to the CBCL scores (24%). On the whole, parents are reported in literature to be better equipped to recognize Externalizing problems in their children's behavior because these are more visible than internal problems or intrapsychic difficulties. Internalizing problems might also be more socially acceptable because of the limited impact they have on the outside world (62).

The parents' supportive intervention offered in the Neuropsychiatric Service aimed to help parents recognize their child's and their own emotional difficulties (63, 64). Whilst the children and adolescents' psychopathology had improved after therapy; in our study, adults' parenting skills did not seem to follow the same trend and no positive change was

evaluated in the domain of *family empowerment*. This result may be motivated by a number of reasons. It may be that increasing parents' awareness of specific issues might prompt a sense of incompetence and guilt, independently from their children's clinical outcome. Interestingly, parents reported greater improvements, in their children's symptoms, than their children 12 months after treatment. Furthermore, it would have been helpful to explore if feelings linked to ending the treatment impacted parents' ratings on the *Family Empowerment Scale*.

It may also be important to consider that clients presented with high levels of comorbidity at referral and received an ICD-10 diagnosis following their assessment. It was not possible to evaluate the impact of receiving a diagnosis on the family nor on their children's symptoms' improvements and it is hoped that further qualitative work will explore the impact that this may have on the family's perception of empowerment.

Based on findings of existing literature, parents of children with behavioral or emotional difficulties seem to experience lower levels of self-efficacy than parents of children/adolescents who are not affected by mental health issues (65). Parent psychodynamic work can be highly beneficial in supporting child/adolescent psychotherapy, after an initial period of adjustments and adaptation has been made.

It is relevant to consider that a self-report measure might not capture the nuances of what is defined as clinical change and improvement in parent work, not accounting for the family's history, nor for their current relationship dynamics or difficulties. Given the risk of adopting a reductivist approach to the dimension of change in psychodynamic psychotherapy with children, young people and their families, more in depth/qualitative research would be helpful in studying what leads to change both in individual and in parents' therapeutic work and how to capture it. As Whitefield and Midgley suggest, "working with parents' histories in parent work, however, where parents are attending sessions without their child, and yet not as patients themselves, may bring with it particular challenges" [(24), p. 273]. Systemic and psychoanalytic theories seem to agree in saying that homeostatic influences and resistances can occur when working clinically with families; change in one or the other parent could affect the couple's relationship, as well as their sense of empowerment (66).

CONCLUSION

It is important to highlight that this outcome study has attempted to capture information on the symptoms of a clinical population seen in a local Mental Health Service in Northern Italy to evaluate whether these symptoms had improved after 12 months of short-term-psychodynamic psychotherapy. The use of well-validated self-report measures was essential but felt limited to T0 and T12. It would have been useful to collect data *in itinere*, and thus draw comparisons that would shed light on *how* (and not only *if*) our young participants responded to the treatment. The authors recognize that self-report questionnaires are susceptible to psychological biases and can be under the influence of social desirability.

Further, the way participants were assigned to each condition of the study—namely based on their clinical presentations and profiles—prevented any randomization and no causal relationships between the variables could be inferred from this research.

Despite these limitations, our results seem to demonstrate an overall effectiveness, on symptoms' reduction, of our time-limited psychodynamic psychotherapy in treating children and adolescents with psychopathological issues. This study is rooted in the real-world experience of clinical practice and therefore may present with important strengths. Its preliminary findings contribute to the growing body of literature on the use and the effectiveness of short-term psychodynamic psychotherapy with children and adolescents for a variety of psychiatric diagnoses (20, 67–69). Mindful that an outcome study is the starting line for future research on the topic, this study's findings add to the growing evidence calling for more tailored and bespoke interventions for children and adolescents. This is based on the view that a child's development is the product of a varied and dynamic interaction between closely-interwoven factors, including co-parenting and the child's treatment within the family (70).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation, to any qualified researcher.

ETHICS STATEMENT

Ethical-Committee approval CEP 204 SC.

CONSENT

The authors declare that written informed consent was obtained from all patients (or other parties) before their participation in the study, which had obtained the prior approval of the Ethical Committee of the ULSS 16.

AUTHOR CONTRIBUTIONS

MG, MM, LS, AS, MD, MS, and EF have given a substantial contribution to the conception and implementation of the work, taking part to data acquisition, analysis and discussion, drafting, and revising the manuscript. All authors revised and reached an agreement on the final version of the work.

ACKNOWLEDGMENTS

The broader research project called the Lausanne Trilogue Play used as psychodiagnostic and therapeutic tool in a Neuropsychiatric Unit: an innovative clinical experience working with psychiatric children and adolescents was funded by the Italian Ministry of Health (GR-2010-2318865).

REFERENCES

- World Health Organization. *ICD-10: International Statistical Classification of Diseases and Related Health Problems: Tenth Revision*. 2nd ed. World Health Organization (2004). Available online at: <https://apps.who.int/iris/handle/10665/42980>
- Gabbard GO. *Long-Term Psychodynamic Psychotherapy: A Basic Text*. 3rd ed. Arlington, VA: American Psychiatric Publishing (2017).
- Briggs S, Maxwell M, Keenan A. Working with the complexities of adolescent mental health problems: applying time-limited adolescent psychodynamic psychotherapy (TAPP). *Psychoanal Psychother*. (2015) 29:314–29. doi: 10.1080/02668734.2015.1086414
- Rossouw TI, Fonagy P. Mentalization-based treatment for self-harm in adolescents: a randomized controlled trial. *J Am Acad Child Adolesc Psychiatry*. (2012) 51:1304–13. doi: 10.1016/j.jaac.2012.09.018
- Lemma A, Target M, Fonagy P. *Brief Dynamic Interpersonal Therapy: A Clinician's Guide*. New York, NY: Oxford University Press (2011).
- Midgley N, Cregeen S, Hughes C, Rustin M. Psychodynamic psychotherapy as treatment for depression in adolescence. *Child Adolesc Psychiatr Clin N Am*. (2013) 22:67–82. doi: 10.1016/j.chc.2012.08.004
- Trowell J, Joffe I, Campbell J, Clemente C, Almqvist F, Soininen M, et al. Childhood depression: a place for psychotherapy. *Eur Child Adolesc Psychiatry*. (2007) 16:157–67. doi: 10.1007/s00787-006-0584-x
- Rawson P. *Short-Term Psychodynamic Psychotherapy: An Analysis of the Key Principles*. London: Karnac Books (2002).
- Goodyer IM, Tsancheva S, Byford S, Dubicka B, Hill J, Kelvin R, et al. Improving mood with psychoanalytic and cognitive therapies (IMPACT): a pragmatic Effectiveness superiority trial to investigate whether specialized psychological treatment reduces the risk for relapse in adolescents with moderate to severe unipolar depression: Study protocol for a randomized controlled trial. *Trials*. (2011) 12:175. doi: 10.1186/1745-6215-12-175
- Zepf S. The psychoanalytic process and Freud's concepts of transference and transference neurosis. *Psychoanal Psychol*. (2010) 27:55–73. doi: 10.1037/a0018640
- Cregeen S. *Short-Term Psychoanalytic Psychotherapy for Adolescents With Depression: A Treatment Manual*. London: Routledge (2018).
- Fonagy P, Target M. *Regolazione Affettiva, Mentalizzazione e Sviluppo del sé*. Milano: Raffaello Cortina Editore (2005).
- Hibbs ED. Evaluating empirically based psychotherapy research for children and adolescents. *Eur Child Adolesc Psychiatry*. (2001) 10:1/3–1/1. doi: 10.1007/s007870170002
- Weisz JR, Kazdin AE. *Evidence-Based Psychotherapies for Children and Adolescents*. New York, NY: Guilford Press (2010).
- Edlund JN, Carlberg G. Psychodynamic psychotherapy with adolescents and young adults: outcome in routine practice. *Clin Child Psychol Psychiatry*. (2016) 21:66–80. doi: 10.1177/1359104514554311
- Leblanc M, Ritchie M. A meta-analysis of play therapy outcomes. *Couns Psychol Q*. (2001) 14:149–63. doi: 10.1080/09515070110059142
- Abbass AA, Rabung S, Leichsenring F, Refseth JS, Midgley N. Psychodynamic psychotherapy for children and adolescents: a meta-analysis of short-term psychodynamic models. *J Am Acad Child Adolesc Psychiatry*. (2013) 52:863–75. doi: 10.1016/j.jaac.2013.05.014
- Midgley N, Kennedy E. Psychodynamic psychotherapy for children and adolescents: a critical review of the evidence base. *J Child Psychother*. (2011) 37: 232–60. doi: 10.1080/0075417X.2011.614738
- Briggs S, Lyon L. A developmentally focused time-limited psychodynamic psychotherapy for adolescents and young adults: origins and application. *Adolescence*. (2011) 76:415–34. doi: 10.3917/ado.076.0415
- Muratori F, Picchi L, Bruni G, Patarnello M, Romagnoli G. A two-year follow-up of psychodynamic psychotherapy for Internalizing disorders in children. *J Am Acad Child Adolesc Psychiatry*. (2003) 42:331–9. doi: 10.1097/00004583-200303000-00014
- Abbass AA, Kisely SR, Town JM, Leichsenring F, Driessen E, De Maat S, et al. Short-term psychodynamic psychotherapies for common mental disorders. *Cochrane Database Syst Rev*. (2014) CD004687. doi: 10.1002/14651858.CD004687.pub4
- McBride BA, Schoppe-Sullivan SJ, Ho MH. The mediating role of fathers'school involvement on student achievement. *J Appl Dev Psychol*. (2005) 26:201–16. doi: 10.1016/j.appdev.2004.12.007
- Bergin C, Bergin D. Attachment in the classroom. *Educ Psychol Rev*. (2009) 21:141–70. doi: 10.1007/s10648-009-9104-0
- Whitefield C, Midgley N. 'And when you were a child?': how therapists working with parents alongside individual child psychotherapy bring the past into their work. *J Child Psychother*. (2015) 41:272–92. doi: 10.1080/0075417X.2015.1092678
- Gatta M, Balottin L, Mannarini S, Chesani G, Del Col L, Spoto A, et al. Familial factors relating to alexithymic traits in adolescents with psychiatric disorders. *Clin Psychol*. (2016) 21:252–62. doi: 10.1111/cp.12098
- Gatta M, Miscioscia M, Sudati L, Sisti M, Comis I, Battistella BA. Contribution of analyses on triadic relationships to diagnostics and treatment planning in developmental psychopathology. *Psychol Rep*. (2017) 120:290–304. doi: 10.1177/0033294116688454
- Mannarini S, Balottin L, Munari C, Gatta M. Assessing conflict management in the couple: the definition of a latent dimension. *Family J*. (2016) 25:13–22. doi: 10.1177/1066480716666066
- Gatta M, Miscioscia M, Sisti M, Comis I, Battistella PA. Interactive family dynamics and non-suicidal self-injury in psychiatric adolescent patients: a single case study. *Front Psychol*. (2017) 8:1–5. doi: 10.3389/fpsyg.2017.00046
- Feinstein NR, Fielding K, Uduari-Solner A, Joshi SV. The supporting alliance in child and adolescent treatment: enhancing collaboration among therapists, parents and teachers. *Am J Psychother*. (2009) 63:319–44. doi: 10.1176/appi.psychotherapy.2009.63.4.319
- Novick KK, Novick J. A new model of techniques for concurrent psychodynamic work with parents of child and adolescent psychotherapy patients. *Child Adolesc Psychiatr Clin N Am*. (2013) 22:331. doi: 10.1016/j.chc.2012.12.005
- Robbins MS, Turner CW, Alexander JF, Perez GA. Alliance and dropout in family therapy for adolescents with behavior problems: individual and systemic effects. *J Fam Psychol*. (2003) 17:534–44. doi: 10.1037/0893-3200.17.4.534
- Karckay AT. The relationship between parental attitude and social comparison of the eight grade students. *Procedia Soc Behav Sci*. (2009) 1:1469–73. doi: 10.1016/j.sbspro.2009.01.259
- Shapiro CJ. Behavioral kernels and brief interventions: teaching parents effective behavior management strategies. *N C Med J*. (2013) 74:57–9.
- Midgley N, O'Keeffe S, French L, Kennedy E. Psychodynamic psychotherapy for children and adolescents: an updated narrative review of the evidence base. *J Child Psychother*. (2017) 40:1–23. doi: 10.1080/0075417X.2017.1323945
- Miscioscia M, Simonelli A, Svanellini L, Sisti M, Sudati L, Brianda M, et al. An integrated approach to child psychotherapy with co-parental support: a longitudinal outcome study. *Res Psychother: Psychopathol Proc Outcome*. (2018) 21. doi: 10.4081/ripppo.2018.297
- Gatta M, Sisti M, Sudati L, Miscioscia M, Simonelli A. The Lausanne Trilogue Play within the outcome evaluation in infant mental health: a preliminary report. *Res. Psychother. Psychopathol. Process Outcome*. (2016) 19. doi: 10.4081/ripppo.2016.198
- Lis A, Zennaro A, Mazzeschi C. Child and adolescent empirical psychotherapy research: a review focused on cognitive-behavioral and psychodynamic-informed psychotherapy. *Eur Psychol*. (2001) 6:36–64. doi: 10.1027//1016-9040.6.1.36
- Achenbach TM, Rescorla LA. *Manual for ASEBA School-Age Forms & Profiles*. Burlington: University of Vermont, Research Center for Children, Youth and Families (2001).
- Wechsler D. *WISC-III: Wechsler Intelligence Scale for Children*. New York, NY: The Psychological Corporation (1991).
- Wechsler D. *Wechsler Preschool and Primary Scale of Intelligence - Revised*. San Antonio, TX: The Psychological Corporation (1989).
- Gabbard GO, Del Corno F, Lingardi V (Eds.). *Le Psicoterapie: Teorie e Modelli D'Intervento*. Milano: Raffaello Cortina (2010).
- Chinitz S, Guzman H, Amstutz E, Kohchi J, Alkon M. Improving outcomes for babies and toddlers in child welfare: a model for infant mental health intervention and collaboration. *Child Abuse Neglect*. (2017) 70:190–8. doi: 10.1016/j.chiabu.2017.05.015

43. Piovano B. Parenthood and parental functions as a result of the experience of parallel psychotherapy with children and parents. *Int. Forum Psychoanal.* (2004) 13:187–200. doi: 10.1080/08037060410000650
44. Frigerio A, Cattaneo C, Cataldo MG, Schiatti A, Molteni M, Battaglia M. Behavior and emotional problems among Italian children and adolescents aged 4 to 18 years as reported by parents and teachers. *Eur J Psychol Assess.* (2004) 20:124–33. doi: 10.1027/1015-5759.20.2.124
45. Ivanova M, Achenbach T, Dumenci L, Rescorla L, Almqvist F, Weintraub S, et al. Testing the 8-syndrome structure of the Child Behavior Checklist in 23 societies. *J Clin Child Adolesc Psychol.* (2007) 36:405–15. doi: 10.1080/15374410701444363
46. Ivanova MY, Achenbach TM, Rescorla LA, Dumenci L, Almqvist F, Bilenberg N, et al. The generalizability of the youth self-report syndrome structure in 30 societies. *J Consult Clin Psych.* (2007) 75:729–38. doi: 10.1037/0022-006X.75.5.729
47. Koren PE, De Chillo N, Friesen BJ. Measuring empowerment in families whose children have emotional disabilities: a brief questionnaire. *Rehabil Psychol.* (1992) 37:305–21. doi: 10.1037/h0079106
48. Peters G-JY. The alpha and the omega of scale reliability and validity: why and how to abandon Cronbach's alpha and the route towards more comprehensive assessment of scale quality. *Eur Health Psychol.* (2014) 16:56–69. doi: 10.31234/osf.io/h47fv
49. McDonald RP. *Test Theory: A Unified Treatment*. Mahwah, NJ: Psychology Press (1999).
50. Zinbarg R, Revelle W, Yovel I, Li W. Cronbach's α , Revelle's β , and McDonald's ω H: their relations with each other and two alternative conceptualizations of reliability. *Psychometrika.* (2005) 70:123–33. doi: 10.1007/s11336-003-0974-7
51. Zinbarg R, Yovel I, Revelle W, McDonald R. Estimating generalizability to a universe of indicators that all have an attribute in common: a comparison of estimators for. *Appl Psychol Meas.* (2006) 30:121–44. doi: 10.1177/0146621605278814
52. JASP Team. *JASP (Version 0.9)* [Computer Software] (2018).
53. Roth A, Fonagy P. *What Works For Whom?: A Critical Review of Psychotherapy Research*. New York, NY: Guilford Press (2006).
54. Stone LL, Otten R, Engels RC, Kuijpers RC, Janssens JM. Relations between internalizing and externalizing problems in early childhood. In: *Child & Youth Care Forum*. Vol. 44. Springer US. (2015). p. 635–53.
55. Johnston C, Chronis-Tuscano A. Families and ADHD. In: Barkley RA, editor. *Attention-deficit/Hyperactivity Disorder: A Handbook for Diagnosis and Treatment*. New York, NY: The Guilford Press (2014). p. 191–209.
56. Stormshak EA, Bierman KL, McMahon RJ, Lengua LJ. Parenting practices and child disruptive behavior problems in elementary school. *J Clin Child Psychol.* (2000) 29:17–29. doi: 10.1207/S15374424jccp2901_3
57. Loginova SV, Slobodskaya HR. The mediating role of parenting in the relation between personality and externalizing problems in Russian children. *Pers Individ Dif.* (2016) 106:275–80. doi: 10.1016/j.paid.2016.10.055
58. Luborsky L, McLellan AT, Woody GE, O'Brien CP, Auerbach A. Therapist success and its determinants. *Arch Gen Psychiatry.* (1985) 42:602–11. doi: 10.1001/archpsyc.1985.01790290084010
59. Papoušek M, Wollwerth de Chuquisengo R. Integrative kommunikationszentrierte Eltern-kleinkind-psychotherapie bei frühkindlichen Regulationsstörungen. *Prax Kinderpsychol Kinderpsychiatr.* (2006) 55:235–54.
60. Fonagy P. The effectiveness of psychodynamic psychotherapies: An update. *World Psychiatry.* (2015) 14:137–50. doi: 10.1002/wps.20235
61. Gonzales JM. A case study of psychodynamic psychotherapy for bipolar disorder. *Am J Psychother.* (2007) 61:405–22. doi: 10.1176/appi.psychotherapy.2007.61.4.405
62. Kazdin AE. *Parent Management Training: Treatment for Oppositional, Aggressive, and Antisocial Behavior in Children and Adolescents*. New York, NY: Oxford University Press (2005).
63. Gatta M, Dal Zotto L, Nequinio G, Del Col L, Sorgato R, Ceranto G, et al. Parents of adolescents with mental disorders: Improving their caregiving experience. *J Child Fam Stud.* (2011) 20:478–90. doi: 10.1007/s10826-010-9415-2
64. Gatta M, Ramagliani E, Lai J, Svanellini L, Toldo I, Del Col L, et al. Psychological and behavioral disease during developmental age: the importance of the alliance with parents. *Neuropsychiatr Dis Treat.* (2009) 5:541–6. doi: 10.2147/NDT.S5880
65. Sanders MR, Woolley ML. The relationship between maternal self-efficacy and parenting practices: implications for parent training. *Child Care Health Dev.* (2005) 31:65–73. doi: 10.1111/j.1365-2214.2005.00487.x
66. Sutton A, Hughes L. The psychotherapy of parenthood: towards a formulation and valuation of concurrent work with parents. *J Child Psychother.* (2005) 31:169–88. doi: 10.1080/00754170500221253
67. Goldfried MR, Wolfe BE. Toward a more clinically valid approach to therapy research. *J Consult Clin Psychol.* (1998) 66:143. doi: 10.1037/0022-006X.66.1.143
68. Leichsenring F, Rabung S. Effectiveness of long-term psychodynamic psychotherapy: a meta-analysis. *JAMA.* (2008) 300:1551–65. doi: 10.1001/jama.300.13.1551
69. Gatta M, Canetta E, Zordan M, Spoto A, Ferruzza E, Manco I, et al. Alexithymia in juvenile primary headache sufferers: a pilot study. *J Headache Pain.* (2011) 12:71–80. doi: 10.1007/s10194-010-0248-6
70. Lindahl KM. Methodological issues in family observational research. In: Kerig PK, Lindahl KM, editors. *Family Observational Coding Systems: Resources for Systemic Research*. Philadelphia, PA: Brunner/Mazel (2001). p. 23–32.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2019 Gatta, Miscioscia, Svanellini, Spoto, Diffronzo, de Sauma and Ferruzza. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.



Predictive and Incremental Validity of Parental Representations During Pregnancy on Child Attachment

Renata Tambelli*, Cristina Trentini and Francesco Dentale

Department of Dynamic and Clinical Psychology, "Sapienza" University of Rome, Rome, Italy

OPEN ACCESS

Edited by:

Daniela Di Riso,
University of Padua, Italy

Reviewed by:

Marina Miscioscia,
University of Padua, Italy
Elisa Di Giorgio,
University of Padua, Italy

*Correspondence:

Renata Tambelli
renata.tambelli@uniroma1.it

Specialty section:

This article was submitted to
Children and Health,
a section of the journal
Frontiers in Public Health

Received: 28 November 2018

Accepted: 10 November 2020

Published: 02 December 2020

Citation:

Tambelli R, Trentini C and Dentale F
(2020) Predictive and Incremental
Validity of Parental Representations
During Pregnancy on Child
Attachment.
Front. Public Health 8:439449.
doi: 10.3389/fpubh.2020.439449

Parental pre-natal representations predict the interactive patterns that parents will put in place after childbirth. Early interactions defined by high parental emotional availability (EA) influence the development of security in children. To date, research on the predictive role of parental pre-natal representations on child attachment is still poor. Moreover, investigations on pre-natal representations have mainly focused on mothers. This study aimed at: investigating the criterion validity of the Interview of Maternal Representations During Pregnancy-Revised (IRMAG-R) and of the Interview of Paternal Representations During Pregnancy (IRPAG), using EA, parental attachment, and child attachment toward both parents, as criteria; testing the incremental validity of the IRMAG-R and IRPAG in the prediction of child attachment, controlling for other covariates, such as depressive and anxious levels during pregnancy, EA, and parental attachment; evaluating the possible mediation role of EA on the relationship between parental representations during pregnancy and child attachment. Fifty couples of primiparous parents were recruited during pregnancy, when the IRMAG-R and IRPAG were administered to mothers and fathers. At 6–9 months after childbirth, the mother–child and father–child interactions were coded by means of the EA Scales (EAS). At 14–18 after childbirth, the Adult Attachment Interview (AAI) was administered to parents, and the Strange Situation Procedure (SSP) was carried out to assess children's attachment toward mothers and fathers, respectively. The results showed significant correlations between parental pre-natal representations and EA, parental attachment and child attachment. As regards the prediction of child attachment, the IRMAG-R/IRPAG categories showed: a significant and large unique contribution for maternal representations; a close to be significant contribution for paternal representations (with a higher effect size for mothers than fathers). Moreover, while the indirect effect of pre-natal representations in the prediction of child attachment was not significant for mothers, it was instead significant for fathers. The results of this study confirmed the criterion validity of the IRMAG-R and IRPAG, and supported the incremental validity of the IRMAG-R and IRPAG in the prediction of children's attachment categories. Finally, the mediation models revealed that EA did not mediate the relationship between maternal pre-natal representations and child attachment, while it totally mediated the relationship between paternal pre-natal representations and child attachment.

Keywords: pregnancy, parental pre-natal representations, parent–child interactions, emotional availability, child attachment

INTRODUCTION

The parent–child relationship begins during pregnancy, when both women and men face dramatic psychological reorganizations related to the new task of becoming parents (1–4). In women, these transformative processes are sustained by the development of mental representations, concerning themselves as mothers, the unborn infant, and the future relationship with him (5–9). Maternal representations become particularly clear and rich by the third trimester of pregnancy (10), when the mothers can fully perceive their infant's vitality thorough intrauterine movements and ultrasound images (1, 5, 11–14). These perceptual experiences allow the mothers to experience a shift from focusing on themselves to their infant as a separate object (15).

Although pre-natal representations have been poorly investigated in men, the existing literature shows that expectant fathers also create an emotional bond with the infant (16–18), and this bond increases as the pregnancy progresses (19–21).

Pre-natal mental representations include projections, dreams, attributions, and fantasies, which are strictly related to parents' childhood attachment experiences (22, 23). During pregnancy, such early experiences become closer to conscious awareness, allowing both women and men to identify with their parents and—at the same time—develop their own parental identity (12, 24). As George and Solomon (25) have underlined, a relevant change takes place in the representational world of expectant parents, whose goals switch from being cared to being caregivers.

A central task for expectant parents is developing a feeling of intimate connection to the infant and, progressively, recognizing him/her as a separate individual who has the need for both care and autonomy (2). Consistent with these considerations, Tambelli et al. (26) have underlined that, when pre-natal representations are flexible and open to change, parents can “have an unconditional acceptance of the infant and a realistic consideration of the baby's individual characteristics and of any difficulties emerging in the relationship with him or her” (pp. 378–379).

Parental pre-natal representations tend to be relatively stable after their formation, serving as a sensitive indicator of the caregiving behaviors (25, 27) and interactive patterns that parents will put in place after childbirth (26, 28, 29).

Emotional Availability and Child Attachment

After childbirth, the parent–child relationship takes the form of a “reciprocal interchange,” that occurs between the innate propensity of infants to engage with and share the subjective states of others (30, 31) and the ability of parents to interpret and respond appropriately to the emotional underpinnings of their infant's overt behavior (32).

From such a perspective, the theoretical construct of *Emotional Availability* (EA) (33, 34) provides a relevant description of the parent–infant relationship. Such a construct—which is theoretically grounded on attachment theory (35) and integrated with Emde's conceptualization of emotions (36)—refers

to the “capacity of a dyad to share an emotional connection and to enjoy a mutually fulfilling and healthy relation” [(37), p. 1]. Scientific literature has documented that EA predicts a wide range of child outcomes, including attachment security [for a review, see (38, 39)].

During the first year of life, repeated interactions with the parents are internalized as an internal working models (IWMs) of attachment (35). IWMs can be regarded as generalized representations of “lived experiences” with primary caregivers (40, 41), that remain fairly stable across the lifespan (42–45).

Early positive emotional interactions allow the children to consider the parents as *secure base* (42), that is as someone who is emotionally available to them in times of distress (35, 46, 47). The internalization of these positive interactive experiences (and of their related affects) promote the development of attachment security in children. In these cases, IWMs include positive expectations about others' EA and willingness to provide support, along with positive representations of the self as competent and valued. Conversely, when parents are not emotionally available and responsive, children develop doubts about their self-worth and others' goodwill, and use defensive strategies other than confident proximity seeking, to face distress. As a result of these negative emotional experiences, two insecure IWMs—*avoidant* or *resistant/ambivalent*—are likely to develop. Avoidance reflects a tendency to use *deactivating* strategies, in response to parents that children perceive as insensitive or rejecting to their attachment needs of reassurance (48). In these cases, children tend to hide or suppress negative emotions (such as anxiety, fear, anger or need for consolation) and deal with distress autonomously to avoid the frustration caused by the potential rejection from the parents (44, 49–52). On the contrary, resistant/ambivalent attachment reflects the use of *hyperactivating* strategies, in response to parents who show inconsistent, hesitant or unpredictable EA toward the emotional needs of their children (48). In these cases, children tend to amplify proximity seeking behaviors to demand or force the parents to be accessible and to pay more attention to them (48, 53).

Aims of the Study

Whereas, a large body of research has explored the influence of parental post-natal representations on the quality of attachment in children, studies on the predictive role of parents' pre-natal representations on child attachment are still very scarce. Given that pre-natal representations are found to be related to both post-natal representations and post-natal parent–infant interaction (7, 54, 55), it would be important that the influence of parental pre-natal representations on parent–child attachment may also be investigated. At the same time, it is worth noting that, even though research has come to document the relevant influence of fathers on children's development (56, 57), over the past decades, research on parental pre-natal representations have mainly focused on mothers (18). We believe that the lack of studies on fathers represents a further relevant gap within scientific literature, which should be filled by greater attention toward paternal contribution to child socio-emotional development.

Considering the importance of exploring, both in mothers and in fathers, the complex constellations of mental representations during pregnancy as well as their influence on child attachment, this study aimed at:

- investigating the criterion validity of the IRMAG-R and IRPAG, using EA in mother-child and father-child interactions (hereafter referred to as maternal EA and paternal EA), parental attachment, and child attachment toward parents as criteria;
- testing the incremental validity of the IRMAG-R and IRPAG in the prediction of child attachment, with respect to parental depressive and anxious levels during pregnancy, EA scales, and parental attachment;
- evaluating the possible mediation role of EA on the relationship between parental representations during pregnancy and child attachment.

We expected that, both in mothers and in fathers, mental representations during pregnancy will be positively correlated with EA as well as parental and children's attachment categories.

We also expected that, both in mothers and fathers, the categories of pre-natal mental representations will provide a unique incremental contribution in the prediction of children's attachment categories, even when parental depressive and anxious level during pregnancy, EA, and attachment were included as covariates.

Finally, we expected that, both in mothers and in fathers, EA will mediate the effect of pre-natal parental representations on children's attachment.

MATERIALS AND METHODS

Participants

Initially, 189 couples of primiparous parents were recruited at seventh/eighth month of pregnancy, while they were attending childbirth preparation courses at maternity and child health services. These parents had been enrolled in a larger extensive research, aimed at assessing the effects of early interventions on parents at risk for psychopathological symptoms and on their children's socio-emotional development during the first year of life. The screening of parental anxiety and depression revealed 78 couples in which both parents were within the normal range. These parental couples were excluded from the general study and were enrolled in the present investigation. Of these 78 couples, 28 were ruled out because they did not complete all the longitudinal observations. Thus, the final samples consisted of 50 couples of primiparous mothers (mean age = 33.88 years; SD = 4.58) and primiparous fathers (mean age = 36.90 years; SD = 6.69).

The gestation period did not reveal complications for 66% of mothers, and only 8% of them reported that they needed at least one hospitalization. In addition, 20% of mothers reported having had abortions previously. At the time of the study neither mothers nor fathers showed the presence of anxious or depressive symptoms.

This study was carried out in accordance with the recommendations of the Ethics Committee of the Department of Dynamic and Clinical Psychology, "Sapienza" University of

Rome. Prior to data collection, the parents received complete information concerning the rationale of the study procedures and provided their written informed consent to participate to the research study, as stated in the Declaration of Helsinki.

Procedure

The longitudinal study included three measurement occasions, in which different types of instruments were administered at the Department of Dynamic and Clinical Psychology: semi-structured interviews, self-report scales, and rating scales applied to videotaped materials.

1. At 7–8 month of pregnancy, a sociodemographic interview was administered to the mothers and fathers, with self-reported questionnaires that assessed depressive and anxious symptomatology [i.e., the Edinburgh Post-natal Depression Scale (EPDS) and the State-Trait Anxiety Inventory Y form (STAI-Y), respectively]. Parents also completed semi-structured interviews that assessed their mental representations [i.e., the Interview of Maternal Representations During Pregnancy-Revised (IRMAG-R) and the Interview of Paternal Representations During Pregnancy (IRPAG)].
2. At 6–9 months after childbirth, the mother-child and father-child free-play-home interactions (lasting ~15–20 min) were filmed and coded by means of the Emotional Availability Scale (EAS).
3. At 14–18 months after childbirth, the Adult Attachment Interview (AAI) was administered to both mothers and fathers, and the Strange Situation Procedure (SSP) was carried out to assess the quality of children's attachment toward mothers and fathers, respectively.

Instruments

State-Trait Anxiety Inventory Y form (STAI-Y) (58); Italian version by Pedrabissi and Santinello (59). It is a self-report scale designed to measure both state (Y-1 form) and trait (Y-2 form) anxious subjective states, such as tension, worry, restlessness, nervousness and reactivity. State and trait subscales include 20 items with a four-point Likert scale. The Italian version presented alphas > 0.85 in both adult and adolescent samples. Global scores of state and trait anxious symptoms were computed summing up all 20 items for each scale. The cut-off value for a clinical anxiety level is 40.

Edinburgh Post-natal Depression Scale (EPDS) [(60), Italian version by (61)]. Even though this self-report scale was originally developed to measure depressive symptomatology in mothers during the post-natal period, its validity has also been successively demonstrated during pregnancy as well as in its application with fathers. The EPDS includes 10 items that explore the presence of the following depressive symptoms during the past week: inability to laugh, inability to enjoy, unmotivated feelings of guilt, state of anxiety or worry, moments of fear or panic, feeling of being overwhelmed by things, difficulty in sleep due to sadness and unhappiness, feeling of sadness, presence of excessive crying, thinking of getting hurt. The internal consistency of the Italian version of the EPDS was

evaluated both with a Cronbach's estimation ($\alpha = 0.79$) and Guttman split-half index ($r_{tt} = 0.82$). A Global Score for depressive symptomatology was computed summing up all items. The cut-off value for the Italian version of the scale is 12/13 for clinical depression and 9/10 for screening purposes.

Interview of Maternal Representations During Pregnancy-Revised (IRMAG-R) (8, 9, 62) and *Interview of Paternal Representations During Pregnancy* (IRPAG) (28). These semi-structured interviews consist of 47 open questions, designed to assess maternal and paternal representations during the third trimester of pregnancy, by examining parental narratives regarding the future child and the unfolding of the relationship with him/her. Parental narratives are coded as a function of seven different dimensions (i.e., richness of perceptions, openness to change, intensity of investment, coherence, differentiation, social dependency, and dominance of fantasies), that allow the mothers' and fathers' transcripts to be classified into one of three categories: *Integrated/Balanced*, *Restricted/Disengaged* and *Not Integrated/Ambivalent*. The *Integrated/Balanced* category is characterized by the ability of parents to provide a consistent picture of their experience in the context of their personal history; they give rich, affectively involved and flexible representations of their children, even though still unborn, and of their future with him/her. Parents consider pregnancy as an important step of personal development and the fulfillment of their personal identity. *Restricted/Disengaged* category is characterized by rigid representations, impersonality, poor fantasies, and high emotional control and inhibition. Moreover, restricted/disengaged parents usually show difficulty imagining and managing the relationship with their children, and recognizing the experience of pregnancy. Finally, in *Not Integrated/Ambivalent* category, parents tend to report not organized and poorly coherent narratives, in which different tendencies toward parenthood and the child coexist (defined by excessive involvement and the struggle to impose distances), as they are strongly absorbed by their conflicts with their original family or partners. The degree of inter-rater reliability for all dimensions as estimated in terms of agreement between judges was: 0.86 for Richness of Perceptions; 0.89 for Openness to Change; 0.90 for Intensity of Investment; 0.84 for Coherence; 0.93 for Differentiation; 0.97 for Social Dependency, and 0.86 for Dominance of Fantasies, confirming the high level of reliability of the instrument (62).

Emotional Availability Scales (EAS) (34). The EAS coding system [EAS 4th Edn; (63)] was applied to 15/20 min of video-recorded free-play home-interactions. The instrument was composed of six scales designed to assess different dimensions of parent-child emotional regulation. Four scales concern parental EA toward children (*Sensitivity*, *Structuring*, *Non-Intrusiveness*, and *Non-Hostility*), and two concern children's EA toward parents (*Responsiveness* and *Involvement*), with a range from one (highly emotional unavailable) to seven (highly emotional available) points. *Sensitivity* refers to parental affectivity, acceptance, flexibility, clarity of perceptions, affect regulation, and variety and creativity that was shown during play toward children. *Structuring* refers to parental capacity to give rules, regulations and a supportive framework for interaction.

Non-Intrusiveness refers to parental capacity to interact with the child without being over-directive, over-stimulating or overprotective. *Non-Hostility* concerns covert and overt parental hostility. *Responsiveness* refers to children's availability toward their parents' requests of interaction, along with children's enjoyment of the interaction. *Involvement* regards children's willingness to interact with their parents. Inter-rater reliability, assessed with mean absolute agreement intraclass correlation coefficients (ICC), ranged from 0.81 to 0.93.

Adult Attachment Interview (AAI) (64). The AAI is a semi-structured interview formed by 20 questions requesting respondents to describe their relationship with main attachment figures during childhood, specific positive or negative memories, traumas, and current attachment relationships. Some questions specifically concern crucial events related to attachment relationships, such as illnesses, separations and rejections. Adult participants are asked to recall autobiographical memories from early childhood in order to evaluate the narratives produced, by considering the structural dimension of the transcript rather than its content. The AAI coding system was applied to categorize participants into one of five categories corresponding to different states of mind with respect to attachment: *Secure/Autonomous* (F); *Dismissing* (Ds); *Preoccupied* (E); *Unresolved/Disorganized* (U); *Cannot Classify* (CC). The F classification includes individuals who value attachment relationships, describe their attachment experiences (whether positive or negative) coherently and consider them important for their own personality. In the DS classification, adults tend to minimize the importance of attachment for their own lives or to idealize their childhood experiences. Adults classified as E tend to maximize the importance of attachment, are still very much involved and preoccupied with their past experiences, and are unable to describe them coherently and reflectively. Anger or passivity characterizes the discourse style of these adults. The additional classification U is applied to interviewees who show signs of unresolved experiences of trauma usually involving the loss of attachment figures. Finally, the CC classification is applied when a transcript has strong characteristics of both the dismissing and preoccupied categories. Inter-rater reliability with respect to the main category was 89% with a $k = 0.74$, $p = 0.001$.

Strange Situation Procedure (SSP) (46). The SSP is a standardized laboratory observational procedure, commonly carried out between 12 and 18 months after childbirth, during which the child's attachment behavior toward his/her parent is activated and intensified by the child's exposure to a moderately, yet increasingly stressful situation (i.e., the presence of a strange person and two short separations from the mother). The SSP originally classified infants into three categories: *Secure* (B); *Insecure Avoidant* (A); and *Insecure Resistant/Ambivalent Attachment* (C). The B classification characterizes children who use parents as a secure basis when they are present, show distress when were separated from them and actively seek contact when they return with a certain predisposition to be easily consoled. The A classification characterizes children who do not seek contact and play with parents, and do not show distress when are separated from them. During the reunion with the parents, these children are not interested in seeking proximity

TABLE 1 | Frequency and percentages of IRMAG-R and IRPAG, maternal and paternal AAI, and maternal and paternal SSP categories.

	Integrated/ balanced	Restricted/ disengaged	Not integrated/ ambivalent
IRMAG-R	26 (52%)	11 (22%)	13 (26%)
IRPAG	26 (52%)	15 (30%)	9 (18%)
	Secure/ autonomous	Dismissing	Preoccupied
Maternal AAI	29 (58%)	15 (30%)	6 (12%)
Paternal AAI	27 (54%)	16 (32%)	7 (14%)
	Secure	Avoidant	Ambivalent
Maternal SSP	34 (68%)	8 (16%)	8 (16%)
Paternal SSP	27 (54%)	16 (32%)	7 (14%)

IRMAG-R, Interview of Maternal Representations During Pregnancy-Revised; IRPAG, Interview of Paternal Representations During Pregnancy; Maternal AAI, Maternal Adult Attachment Interview; Paternal AAI, Paternal Adult Attachment Interview; Maternal SSP, Strange Situation Procedure carried out with the mothers; Paternal SSP, Strange Situation Procedure carried out with the fathers.

to them, manifest a tendency to avoid contact with them and continue to play or to explore the environment. Moreover, they are not disturbed in the presence of the unfamiliar adult (the stranger) and during the entire procedure. Finally, The C classification characterizes children who are strongly focused on parents during SSP, show reluctance to explore the environment, and express high levels of distress during the separations from the parents as well as inconsolability during the reunions with them. Main and Solomon (53) later added a fourth category, *Disorganized/Disoriented (D)* defined by odd, awkward behavior and unusual fluctuations between anxiety and avoidance. As reported by George and Solomon (65), when coders are trained to categorize attachment styles using all categories the percentage of agreement between judges was from 80 to 88%.

Data Analysis

To investigate the criterion validity of the IRMAG-R and IRPAG categorizations, point-biserial correlations (for relationships between dichotomous and scale variables) and phi correlations (for relationships between dichotomous variables) were used.

To investigate the incremental validity of the IRMAG-R and IRPAG categorizations in the prediction of children's attachment, with respect to levels of anxiety and depression during pregnancy, parent-child EA, and adult attachment), two logistic regressions were conducted.

Finally, to investigate the mediation role of parent-child EA on the relationship between parental representations during pregnancy and children's attachment patterns, two mediation models were analyzed (one for mothers and one for fathers) through Mplus software, Version 8 (66), using the weighted least square mean and variance adjusted estimator (WLSMV), which allows the computation of the indirect effects also with dichotomous outcomes. Moreover, a biased corrected estimation of confidence intervals of parameters through a bootstrap procedure was used.

TABLE 2 | Descriptive statistics of quantitative scales.

	Maternal mean	Paternal mean	Maternal SD	Paternal SD
STAI-STATE	34.88	32.5	8.75	7.03
STAI-TRAIT	37.54	32.82	7.72	7.89
EPDS	6.34	3.58	4.02	2.94
EAS	5.78	5.57	0.84	0.91

STAI-STATE, State-Trait Anxiety Inventory State Form; STAI-TRAIT, State-Trait Anxiety Inventory Trait Form; EPDS, Maternal Edinburgh Post-natal Depression Scale; EAS, Emotional Availability Scale.

As regards statistical power, it is worth noting that medium/large effect sizes are expected for the relationships among the main factors investigated (i.e., parental representations during pregnancy, EA and children's attachment patterns). In this view, to reach a statistical power of 0.80 with medium/large effects and a level of alpha to 0.05, the number of subjects needed is about 50 subjects for both logistic regressions [G*Power software; (67)] and mediation models with biased corrected confidence intervals for indirect effects' parameters (68).

RESULTS

Descriptive Statistics

Table 1 illustrates the frequency and percentages for each category of the IRMAG-R and IRPAG, maternal AAI and paternal AAI, and SSP, as carried out with the mothers and fathers, respectively (hereafter referred as maternal SSP and paternal SSP).

As regards the narratives about parenthood during pregnancy, more than 50% of representations were Integrated/Balanced for both mothers and fathers. Restricted/Disengaged representations were slightly higher for fathers, while Not Integrated/Ambivalent were slightly higher for mothers.

Regarding parental AAI, more than 50% of both mothers and fathers showed a Secure attachment. The number for Dismissing attachment was higher than that for Preoccupied for both mothers and fathers.

As regards the SSP procedure, more than 50% of the children showed a Secure attachment both toward mothers and fathers. However, a higher percentage of Secure attachment emerged toward mothers rather than toward fathers. The number of children's Insecure Avoidant attachment was two times higher toward fathers rather than toward mothers, while a similar number for Insecure Resistant/Ambivalent attachment was found toward mothers and fathers.

Table 2 shows the descriptive statistics of all scales considered in the present study, with mean scores, standard deviation as well as skewness and kurtosis values for both maternal and paternal scales. Interestingly, mean values are higher for maternal than paternal scores in all scales, especially for trait anxiety (STAI-TRAIT) and depressive symptoms. All scales showed close to normal distribution, except for the kurtosis value of

TABLE 3 | Correlations of IRMAG-R and IRPAG with criteria.

	Maternal/ Paternal EAS	Maternal/ Paternal AAI	Maternal/ Paternal SSP
IRMAG-R	0.676**	0.237	0.628**
IRPAG	0.540**	0.318*	0.479**

IRMAG-R, Interview of Maternal Representations During Pregnancy-Revised; Maternal EAS, Maternal Emotional Availability Scale; Maternal AAI, Maternal Adult Attachment Interview. IRPAG, Interview of Paternal Representations During Pregnancy; Paternal EAS, Paternal Emotional Availability Scale; Paternal AAI, Paternal Adult Attachment Interview. *significant effect at 0.05 alpha level (two tails); **significant effect at 0.01 alpha level (two tails).

TABLE 4 | Logistic regression on maternal SSP attachment.

	B	SE	Wald (1 df)	p	OR	R ² Nagelkerke
Mothers' age	0.07	0.09	0.60	0.44	1.07	0.54
Children's gender	0.63	0.87	0.52	0.47	1.88	
IRMAG-R	3.76	1.31	8.18	0.00	42.73	
Maternal EAS	0.04	0.62	0.01	0.95	1.04	
Maternal AAI	0.06	0.87	0.00	0.95	1.06	
Intercept	-3.53	4.62	0.58	0.45	0.03	

IRMAG-R, Interview of Maternal Representations During Pregnancy-Revised; Maternal EAS, Maternal Emotional Availability Scale; Maternal AAI, Maternal Adult Attachment Interview.

maternal STAI-STATE and scores on EAS related to father-child interactions, which revealed values higher than one.

Criterion Validity of the IRMAG-R and IRPAG

To evaluate the criterion validity of the IRMAG-R and IRPAG, the correlations of maternal and paternal representations during pregnancy with parental EA, and with parental and children's attachment were estimated.

Since some of the IRMAG-R, IRPAG, AAI and SSP categories showed a too low frequency to conduct appropriate statistical analysis (e.g., see **Table 1** referring to Not Integrated/Ambivalent, Preoccupied and Resistant/Ambivalent categories), Restricted/Disengaged, Dismissing and Avoidant categories were collapsed, respectively with Not Integrated/Ambivalent, Preoccupied and Resistant/Ambivalent ones. In this way, parental representations were divided into Integrated vs. Not Integrated categories, parental attachment models into Secure vs. Insecure categories and children's attachment patterns into Secure vs. Insecure categories.

As illustrated in **Table 3**, the IRMAG-R and IRPAG categories (Integrated vs. Not Integrated representations) were positively and significantly correlated (phi correlation) with maternal and paternal AAI and SSP categories, with a high effect size, providing support for their criterion validity. In **Table 3** point-biserial correlations between the IRMAG-R/IRPAG categories

TABLE 5 | Logistic regression on paternal SSP attachment.

	B	SE	Wald	p	OR	R ² Nagelkerke
Paternal age	-0.03	0.07	0.18	0.67	0.97	0.64
Children's gender	0.60	0.89	0.45	0.50	1.82	
IRPAG	1.62	1.04	2.44	0.12	5.07	
Paternal EAS	3.45	1.13	9.24	0.00	31.36	
Paternal AAI	-2.07	1.17	3.10	0.08	0.13	
Intercept	-18.09	6.50	7.76	0.01	0.00	

IRPAG, Interview of Paternal Representations During Pregnancy; Paternal EAS, Paternal Emotional Availability Scale; Paternal AAI, Paternal Adult Attachment Interview.

and EAS scores are also reported. Significant and positive correlations were found between parental representations during pregnancy and parental EAS with a high effect size, with a further support for the criterion validity of IRMAG/IRPAG interviews.

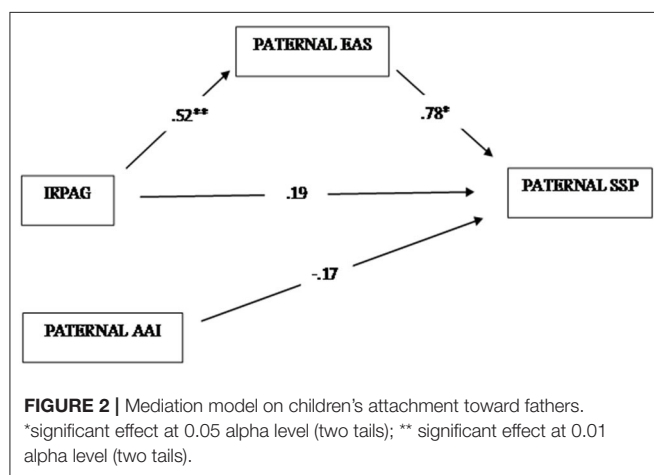
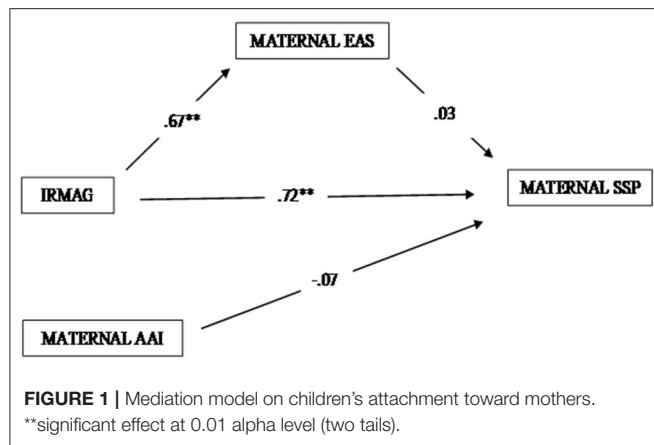
Incremental Validity of the IRMAG-R and IRPAG in the Prediction of Child Attachment

In order to investigate the incremental validity of the IRMAG-R and IRPAG, two logistic regressions (one for mothers and one for fathers) were conducted, including parental representations during pregnancy (Integrated vs. Not Integrated), EA and the parental attachment model (Secure vs. Insecure) as predictors, children's attachment (Secure vs. Insecure) as a criterion, and age and children's gender as covariates. Parental anxious and depressive scores were excluded from these analyses, as they did not show significant correlations neither with IRMAG-R/IRPAG, nor with parental and children's attachment and with EA scales.

As illustrated in **Table 4**, overall maternal predictors accounted for a considerable portion (R^2 Nagelkerke = 0.54) of maternal SSP variability. Moreover, the Hosmer and Lemeshow test indicated an adequate fit for the model [$\chi^2_{(8)} = 5.09, p = 0.75$].

As regards the single predictors, a significant unique contribution emerged for the IRMAG-R with a high effect size in terms of Odds Ratio, while not significant unique contributions were found for maternal AAI, EAS, as well as for children's gender and maternal age.

Similarly, paternal predictors accounted for a high portion (R^2 Nagelkerke = 0.64) of paternal SSP variability (See **Table 5**), and the Hosmer and Lemeshow test again indicated an adequate fit for the model [$\chi^2_{(8)} = 8.48, p = 0.39$]. As regards single predictor effects, a significant unique contribution emerged for paternal EAS, with a high effect size (as evaluated in terms of Odds Ratio), as well as a close to be significant contribution (with a large Odds Ratio) of the IRPAG categories. Not significant contributions were found for AAI categories, children's gender and paternal age (**Table 5**).



Direct and Indirect Effects of Parental Representations During Pregnancy on Child Attachment: the Mediating Role of EA

In order to further investigate the effect of parental representations during pregnancy on children's attachment, two mediation models were tested (one for mothers and one for fathers), including the IRMAG-R/IRPAG categories (Integrated vs. Not Integrated) as independent variables, maternal and paternal EAS scores as mediators, SSP categories (Secure vs. Insecure) toward mothers and fathers as dependent variables, and maternal and paternal AAI categories (Secure vs. Insecure) as covariates. These mediation analyses were conducted with Mplus Version 8 software using the WLSMV estimator and bootstrapping procedure to estimate confidence interval of indirect effects.

The first mediation model, which included maternal variables, showed an adequate fit with the data [$\chi^2_{(1)} = 0.17$, $p = 0.68$; RMSEA = 0.00 (0.00–0.28); CFI = 1.00; TLI = 1.12; WRMR = 0.14]. The model accounted for 53% of children's attachment variability, and for 46% of maternal EA. As illustrated in **Figure 1**, results showed significant direct effects of IRMAG-R categorizations on both EAS scores (Biased Corrected Bootstrap

99% CI: from 0.47 to 0.82) and SSP categories (Biased Corrected Bootstrap 99% CI: from 0.07 to 1.10), and not significant effects of EAS scores (Biased Corrected Bootstrap 99% CI: from –0.37 to 0.62) and maternal AAI categories on SSP ones (Biased Corrected Bootstrap 99% CI: from –0.61 to 0.24).

Moreover, a not significant indirect effect (Estimate = 0.02, Estimate/SE = 0.18, $p < 0.86$) of the IRMAG-R categorizations, via maternal EAS, on children's attachment toward mothers was found (Biased Corrected Bootstrap 99% CI: from –0.25 to 0.45), indicating that the impact of maternal representations during pregnancy on children's attachment was exclusively direct.

Similar to the first model, the second one, which included paternal variables, also showed an adequate fit with the data [$\chi^2_{(1)} = 0.55$, $p = 0.46$; RMSEA = 0.00 (0.00–0.34); CFI = 1.00; TLI = 1.05; WRMR = 0.26]. The model accounted for 76% of children's attachment variability, and for 28% of paternal EA. As illustrated in **Figure 2**, a significant direct effect of the IRPAG categories on EAS scores was found (Biased Corrected Bootstrap 99% CI: from 0.22 to 0.71), along with a significant effect of the EAS scores on children's attachment (Biased Corrected Bootstrap 99% CI: from 0.47 to 1.03). Conversely, not significant direct effects of both IRPAG (Biased Corrected Bootstrap 99% CI: from –0.22 to 0.55) and paternal AAI categories on children's attachment (Biased Corrected Bootstrap 99% CI: from –0.57 to 0.24) were found.

Different from the first model, a significant indirect effect (Estimate = 0.41, Estimate/SE = 4.39, $p < 0.001$) of the IRPAG categories, via paternal EA, on children's attachment toward fathers was found (Biased Corrected Bootstrap 99% CI: from 0.19 to 0.68), indicating that the impact of paternal representations during pregnancy on children's attachment is totally indirect.

DISCUSSION

Whereas the influence of parental post-natal representations on child attachment has been extensively investigated, much less is known about the predictive role of parental pre-natal representations on child attachment. Moreover, the existing literature on pre-natal mental representations have been mainly focused on mothers (18), while paternal mental representations during pregnancy have received scarce attention from the research.

Beginning from these premises, we firstly investigated the criterion validity of the IRMAG-R and IRPAG, using maternal EA, paternal EA, parental attachment, and child attachment toward parents as criteria.

Consistent with our expectations, both in mothers and in fathers, the results showed a strong relationship between pre-natal representations and EA, and between pre-natal representations and child attachment categories (**Table 3**). These associations are supported by the evidence that parental pre-natal expectations, thoughts, and fantasies shape an *anticipatory working model* (6, 69), that sustains women and men in the achievement of a parental identity and in the development of an early attachment bond with their infants (70). Consistent with the results of previous investigations (27, 71, 72), small size correlations (in terms of Cohen's standards) were also found

between pre-natal representations and parental attachment, with a further support for the criterion validity of the IRMAG-R and IRPAG. These results may be interpreted taking into account the role played by the reworking of early attachment relationship in enabling expectant mothers and fathers to achieve their own parental identity and develop the capacity to recognize the unborn infant as a separate individual with specific needs (2). Parents with positive and stable childhood experiences are more likely to develop and maintain flexible and coherent representations about attachment and caregiving during the transition to parenthood (1).

Having explored the criterion validity of parental pre-natal representations, we tested the incremental validity of the IRMAG-R and IRPAG in the prediction of child attachment, with respect to children's gender, parental age, EA scales, and parental attachment.

Contrary to our expectations, even though maternal and paternal predictors accounted for a considerable portion of variability of attachment categories in children, relevant differences between mothers and fathers were found regarding the effects of the single predictors. As regards the mothers, the categories of mental representation during pregnancy provided a significant unique incremental contribution in the prediction of children's attachment categories, while all the other considered predictors did not provide a unique contribution (Table 4). These results evidenced that, compared to children whose mothers have not integrated pre-natal representations, children whose mothers report integrated representations during pregnancy have a higher possibility to develop a sense of security in the attachment relationship. Thus, in our study, maternal pre-natal representations have a specific role in the construction of the attachment bond with the child. Different from that observed in mothers, in the case of fathers, child attachment categories were accounted for by the significant unique contribution of EA during dyadic interactive exchanges. Moreover, fathers' pre-natal representations resulted in providing a weaker (close to be significant) unique contribution to child attachment if compared to maternal representations (Table 5). These results show that children's attachment security toward fathers is more likely to be associated with high EA during dyadic interactive exchanges. Undoubtedly, the results concerning fathers confirmed those of previous investigations that have documented the role of parent-child EA in predicting secure attachment in children (38, 39). At the same time, it is worth noting that, even though pre-natal representations resulted in predicting child attachment both in mothers and (with a lower effect size) in fathers, only in mothers the other predictors did not provide any unique contribution.

Finally, taking into account the peculiarities between maternal and paternal contributions on child attachment, we evaluated the possible mediation role of EA on the relationship between parental representations during pregnancy and child attachment.

Even in this case, the analyses produced unexpected findings. As regards the mothers, results showed significant direct contributions of mental representations in predicting both EA and child attachment categorizations, while no direct effects were found for EA and maternal attachment on child attachment categories. Moreover, no indirect effect of maternal pre-natal

representations, via EA, on children's attachment categories was found (Figure 1). Different from that observed in mothers, in fathers, a significant direct effect of pre-natal representations on EA was found, along with a significant effect of EA on children's attachment category. Conversely, neither paternal pre-natal representations nor paternal attachment category resulted in having a direct effect on children's attachment categories (Figure 2).

The results of our study may be explained by taking into account the well-known condition of *primary maternal preoccupation* (73), that has been conceptualized as "almost an illness" that a mother must experience and recover from, in order to provide the infant with an environment that can meet his/her physical and psychological needs. As Leckman et al. (74) have evidenced, such preoccupations develop during the last months of pregnancy, affecting both mothers and (to a lesser extent) fathers, with the aim of heightening parental ability to anticipate the infant's needs, learn his/her emotional signals, and gradually recognize him/her as an individual. It may be assumed that, because of more intense preoccupations, mothers may be more prone than fathers to develop vivid mental representations of their infants and an early sensitive attitude toward them (75). The results of our study seem to prove that these maternal inclinations are so consolidated during pregnancy as to shape the ground in which the child's sense of security will be rooted.

In mothers, the experience of a *somatic gestation* (26) contributes consistently in increasing the richness and specificity of mental representations about their unborn infants. During pregnancy, maternal mental representations are sustained by the perception of the baby, whose vitality is manifested through intrauterine movements and ultrasound images (1, 5, 11–14). The father's emotional relationship with the unborn infant is instead *indirect*, as it is experienced via the mother's willingness to share with them the affective and somatic experience of pregnancy (76). In this view, it may be assumed that fathers' contribution to their child's attachment security may fully emerge only when they will have the possibility to *really* interact with their *real* child (77).

Limitations and Strengths of the Study

The main constraint of this study is the small number of the recruited parents, as it produced an increase of parameters' standard errors and a decrease of statistical power that limited the possibility to detect low size effects. The small number of participants did not even permit to test the effect of some potentially relevant variables, such as previous abortions (which was reported only by 10 mothers).

As regards the mediation analysis, it is worth noting that all variables included in the model were assessed only on one occasion of measurement. As a consequence, the analyzed models did not include residual change estimations of both mediator and outcome (as computed using autoregression-based statistical procedures), with a possible distortion of parameter estimations (for an extensive explanation, see (78). Further longitudinal studies with multiple measurements of all variables are needed to address this potential source of distortion.

In this study, we adopted a dyadic perspective to evaluate (separately for mothers and fathers) the predictive role played by

pre-natal representations on child attachment. This did not allow examination whether pre-natal triadic family relations might predict mother- and father-child attachment relationship. As regard this issue, a recent investigation has shown that children's attachment toward fathers (but not toward mothers) is predicted by pre-natal triadic family alliance, that is by the ability of the mother and father to cooperate and support each other in their parental roles (79).

Notwithstanding these limitations, no previous study has ever investigated the predictive and incremental validity of maternal and paternal pre-natal representations on child attachment. We believe that our results (albeit preliminary) may provide the starting point for future researches, aimed at shedding further light on the distinct (even though complementary) paths, that mothers and fathers follow to contribute to their children's attachment security.

These reflections lead us to consider the inclusion of fathers (who have been long overlooked in scientific literature on parenting) as a further strength of our study.

Finally, we believe that, in this study, the combined use of clinical semi-structured interviews and observational procedures may have provided an articulated description of the complexity underlying the construction of mother- and father-child attachment relationship.

CONCLUSIONS

The results of this study may have relevant implications for prevention, clinical practice, and future researches, as they indicate pregnancy as a privileged time for the intervention programs that may be designed to support the parents in creating that *intersubjective matrix* (80), within which the child's sense of security develops.

The assessment of mental representations during pregnancy provides the opportunity to recognize parents who will have non-optimal interactions with their infants, after childbirth. Indeed, the IRMAG-R and IRPAG, beyond assessing the emotional valence of parental representations, also allow to identify the presence of defensive strategies (toward pregnancy and the unborn infant) that are sensitive predictors of early impairments in parental EA. These aspects are particularly evident among

parents with psychopathological symptoms (26) and with whom this study needs to be replicated.

DATA AVAILABILITY STATEMENT

The datasets generated for this study are available on request to the corresponding author.

ETHICS STATEMENT

Prior to data collection, the participants received complete information concerning the rationale of the study procedures and provided their written informed consent to participate to the research study, as stated in the Declaration of Helsinki.

AUTHOR CONTRIBUTIONS

RT: conceived the work, monitored data acquisition, and provided a substantial contribution to the interpretation of the data. As first author, she was primarily accountable for all aspects of the work. CT: wrote the Introductions, Discussion, and Conclusions sections, revised the paper for intellectual content, and approved its final version to be published. FD: analyzed data, wrote the Methods and Results sections, revised the paper for intellectual content, and approved its final version to be published. All authors agreed to be accountable for all aspects of the work and to ensure that questions related to the accuracy or integrity of any part of the work were appropriately investigated and resolved.

FUNDING

This research was supported by grants PRIN 2013/2016-20107JZAF4, Italian Ministry for Education, University and Research (MIUR).

ACKNOWLEDGMENTS

The authors thank the parents and the children who participated in this research.

REFERENCES

1. Cohen LJ, Slade A. The psychology and psychopathology of pregnancy: reorganization and transformation. In: Zeanah CH, editor. *Handbook of Infant Mental Health, 2nd Edn.* New York, NY: Guilford Press (2000). p. 20–36.
2. Ammaniti M, Trentini C. How new knowledge about parenting reveals the neurobiological implications of intersubjectivity: a conceptual synthesis of recent research. *Psychoanal Dialogues*. (2009) 19:537–55. doi: 10.1080/10481880903231951
3. Slade A, Cohen LJ, Sadler LS, Miller M. The psychology and psychopathology of pregnancy: reorganization and transformation. In: Zeanah CH, Jr, editor. *Handbook of Infant Mental Health, 3rd Edn.* New York, NY: The Guilford Press (2009). p. 22–39.
4. Raphael-Leff J. Mothers' and fathers' orientations: patterns of pregnancy, parenting and the bonding process. In: Tyano S, Keren M, Herman H, Cox J, editors. *Parenthood and Mental Health. A Bridge Between Infant and Adult Psychiatry*. Oxford: Wiley-Blackwell (2010). p. 9–22. doi: 10.1002/9780470660683.ch1
5. Fava Vizziello G, Antonioli ME, Cocci V, Invernizzi R. From pregnancy to motherhood: the structure of representative and narrative change. *Infant Ment Health J.* (1993) 14:4–16. doi: 10.1002/1097-0355(199321)14:1andlt;1::AID-IMHJ2280140102andgt;3.0.CO;2-S
6. Zeanah CH, Benoit D. Clinical applications of a parent perception interview in infant mental health. *Child Adolesc Psychiatr Clin N Am.* (1995) 4:539–54. doi: 10.1016/S1056-4993(18)30418-8

7. Theran SA, Levendosky AA, Anne Bogat G, Huth-Bocks AC. Stability and change in mothers' internal representations of their infants over time. *Attach Hum Dev.* (2005) 7:253–68. doi: 10.1080/14616730500245609
8. Ammaniti M, Tambelli R. Prenatal self-report questionnaires, scales and interviews. In: Tyano S, Keren M, Herman H, Cox J, editors. *Parenthood and Mental Health: A Bridge Between Infant and Adult Psychiatry*. Chichester: Wiley-Blackwell (2010). p. 109–20. doi: 10.1002/9780470660683.ch11
9. Ammaniti M, Tambelli R, Odorisio F. Exploring maternal representations during pregnancy in normal and at-risk samples: the use of interview for maternal representations during pregnancy. *Infant Ment Health J.* (2013) 34:1–10. doi: 10.1002/imhj.21357
10. Ammaniti M, Baumgartner E, Candelori C, Perucchini P, Pola M, Tambelli R, et al. Representations and narratives during pregnancy. *Infant Ment Health J.* (1992) 13:167–82. doi: 10.1002/1097-0355(199223)13:2andlt;167::AID-IMHJ2280130207andgt;3.0.CO;2-M
11. Stern DN. *The Motherhood Constellation. A Unified View of Parent-Infant Psychotherapy*. New York, NY: Basic Books (1995).
12. Brodén M. *Graviditetens Möjligheter: En Tid då Relationer Skapas och Utvecklas. [The Possibilities of Pregnancy: The Time When Relationships Are Created and Developed]*. Natur och Kultur: Stockholm (2004).
13. Viaux-Savelon S, Dommergues M, Rosenblum O, Bodeau N, Aidane E, Philippon O, et al. Prenatal ultrasound screening: false positive soft markers may alter maternal representations and mother-infant interaction. *PLoS ONE.* (2012) 7:e30935. doi: 10.1371/journal.pone.0030935
14. Ammaniti M, Trentini C, Menozzi F, Tambelli R. Transition to parenthood: studies of intersubjectivity in mothers and fathers. In: Emde RN, Leuzinger-Bohleber M, editors. *Early Parenting and Prevention of Disorder: Psychoanalytic Research at Interdisciplinary Frontiers*. London: Karnac Books (2014). p. 129–64. doi: 10.4324/9780429474064-7
15. Bibring GL, Dwyer TF, Huntington DS, Valenstein AF. A study of the psychological processes in pregnancy and of the earliest mother-child relationship: II. Methodological considerations. *Psychoanal Study Child.* (1961) 16:25–44. doi: 10.1080/00797308.1961.11823198
16. Condon JT. The assessment of antenatal emotional attachment: development of a questionnaire instrument. *Br J Med Psychol.* (1993) 66:167–83. doi: 10.1111/j.2044-8341.1993.tb01739.x
17. Genesoni L, Tallandini MA. Men's psychological transition to fatherhood: an analysis of the literature, 1989–2008. *Birth.* (2009) 36:305–18. doi: 10.1111/j.1523-536X.2009.00358.x
18. Foley S, Hughes C. Great expectations? Do mothers' and fathers' prenatal thoughts and feelings about the infant predict parent-infant interaction quality? A meta-analytic review. *Dev Psychol.* (2018) 48:40–54. doi: 10.1016/j.dr.2018.03.007
19. Righetti PL, Dell'Avanzo M, Grigio M, Nicolini U. Maternal/paternal antenatal attachment and fourth-dimensional ultrasound technique: a preliminary report. *Brit J Psychol.* (2005) 96:129–37. doi: 10.1348/000712604X15518
20. Hjelmstedt A, Widström AM, Collins A. Prenatal attachment in Swedish IVF fathers and controls. *J Reprod Infant Psychol.* (2007) 25:296–307. doi: 10.1080/02646830701668911
21. Habib C, Lancaster S. Changes in identity and paternal-foetal attachment across a first pregnancy. *J Reprod Infant Psychol.* (2010) 28:128–42. doi: 10.1080/02646830903298723
22. Fraiberg S, Adelson E, Shapiro V. Ghosts in the nursery. *J Am Acad Child Psy.* (1975) 14:387–421. doi: 10.1016/S0002-7138(09)61442-4
23. Manzano J, Espasa FP, Zilkha N. The narcissistic scenarios of parenthood. *Int J Psychoanal.* (1999) 80:465–76. doi: 10.1516/0020757991598855
24. Ammaniti M, Candelori C, Pola M, Tambelli R. *Maternità e Gravidanza*. Milano: Raffaello Cortina Editore (1995).
25. George C, Solomon J. Attachment and caregiving: the caregiving behavioral system. In: Cassidy J, Shaver PR, editors. *Handbook of Attachment Theory, Research, and Clinical Applications*. New York, NY; London: Guilford Press (1999). p. 649–70.
26. Tambelli R, Odorisio F, Lucarelli L. Prenatal and postnatal maternal representations in nonrisk and at-risk parenting: exploring the influences on mother–infant feeding interactions. *Infant Ment Health J.* (2014) 35:376–88. doi: 10.1002/imhj.21448
27. George C, Solomon J. Representational models of relationships: links between caregiving and attachment. *Infant Ment Health J.* (1996) 17:198–216. doi: 10.1002/(SICI)1097-0355(199623)17:3<198::AID-IMHJ2>3.0.CO;2-L
28. Ammaniti M, Speranza AM, Tambelli R, Muscetta S, Lucarelli L, Vismara L, et al. A prevention and promotion intervention program in the field of mother–infant relationship. *Infant Ment Health J.* (2006) 21:70–90. doi: 10.1002/imhj.20081
29. Crawford A, Benoit D. Caregivers' disrupted representations of the unborn child predict later infant–caregiver disorganized attachment and disrupted interaction. *Infant Ment Health J.* (2009) 30:124–44. doi: 10.1002/imhj.20207
30. Trevarthen C, Aitken KJ. Infant intersubjectivity: research, theory, and clinical applications. *J Child Psychol Psychiatry.* (2001) 42:3–48. doi: 10.1111/1469-7610.00701
31. Trevarthen C. What is it like to be a person who knows nothing? Defining the active intersubjective mind of a newborn human being. *Infant Child Dev.* (2011) 20:119–35. doi: 10.1002/icd.689
32. Ainsworth MDS. *Infancy in Uganda: Infant Care and the Growth of Love*. Baltimore, MD: Johns Hopkins University Press (1967).
33. Biringen Z, Robinson J. Emotional availability in mother-child interactions: a reconceptualization for research. *Am J Orthopsychiatry.* (1991) 61:258–71. doi: 10.1037/h0079238
34. Biringen Z. Emotional availability: conceptualization and research findings. *Am J Orthopsychiatry.* (2000) 70:104–14. doi: 10.1037/h0087711
35. Bowlby J. *Attachment and Loss: Vol. 1, Attachment*. New York, NY: Basic (1969/1982).
36. Emde RN. Emotional availability: a reciprocal reward system for infants and parents with implications for prevention of psychosocial disorders. In: Taylor PM, editor. *Parent-Infant Relationships*. Orlando, FL: Grune and Stratton (1980). p. 87–115.
37. Biringen Z, Easterbrooks MA. Emotional availability: concept, research, and window on developmental psychopathology. *Dev Psychol.* (2012) 24:1–8. doi: 10.1017/S0954579411000617
38. Biringen Z, Derscheid D, Vliegen N, Closson L, Easterbrooks MA. Emotional availability (EA): theoretical background, empirical research using the EA Scales, and clinical applications. *Dev Rev.* (2014) 34:114–67. doi: 10.1016/j.dr.2014.01.002
39. Saunders H, Kraus A, Barone L, Biringen Z. Emotional availability: theory, research, and intervention. *Front Psychol.* (2015) 6:1069. doi: 10.3389/fpsyg.2015.01069
40. Bretherton I, Fritz J, Zahn-Waxler C, Ridgeway D. Learning to talk about emotions: a functionalist perspective. *Child Dev.* (1986) 57:529–48. doi: 10.2307/1130334
41. Bretherton I. New perspectives on attachment relations: security, communication, and internal working models. In: Osofsky J. *Handbook of Infant Development*. New York, NY: Wiley (1987). p. 1061–100.
42. Bowlby J. *A Secure Base: Clinical Applications of Attachment Theory*. London: Psychology Press (1988).
43. Shaver PR, Mikulincer M. Attachment-related psychodynamics. *Attach Hum Dev.* (2002) 4:133–61. doi: 10.1080/14616730210154171
44. Lenzi D, Trentini C, Tambelli R, Pantano P. Neural basis of attachment-caregiving systems interaction: insights from neuroimaging studies. *Front Psychol.* (2015) 6:1241. doi: 10.3389/fpsyg.2015.01241
45. Cassidy J, Shaver PR, editors. *Handbook of Attachment: Theory, Research, and Clinical Applications, 2nd Edn*. New York, NY: The Guilford Press (2008).
46. Ainsworth MDS, Blehar MC, Waters E, Wall S. *Patterns of Attachment: A Psychological Study of the Strange Situation*. Hillsdale, NJ: Erlbaum (1978).
47. Lyons-Ruth K, Spielman E. Disorganized infant attachment strategies and helpless-fearful profiles of parenting: integrating attachment research with clinical intervention. *Infant Ment Health J.* (2004) 25:318–35. doi: 10.1002/imhj.20008
48. Mikulincer M, Shaver PR. *Attachment in Adulthood: Structure, Dynamics, and Change*. New York, NY: Guilford Press (2007).
49. Main M. Metacognitive knowledge, metacognitive monitoring, and singular (coherent) versus multiple (incoherent) models of attachment. In: Parkes CM, Stevenson-Hinde J, Marris P, editors. *Attachment Across the Life Cycle*. London: Routledge (1991). p. 127–59.

50. Main M. Epilogue. Attachment theory: eighteen points with suggestions for future studies. In: Cassidy J, Shaver PR, editors. *Handbook of Attachment: Theory, Research, and Clinical Applications*. New York, NY: Guilford Press (1999). p. 845–87.
51. Main M, Hesse E, Kaplan N. Predictability of attachment behavior and representational processes at 1, 6 and 19 years of age. In: Grossmann KE, Grossmann K, Waters E, editors. *Attachment From Infancy to Adulthood: The Major Longitudinal Studies*. New York, NY: Guilford Press (2005). p. 245–304.
52. Lenzi D, Trentini C, Pantano P, Macaluso E, Lenzi GL, Ammaniti M. Attachment models affect brain responses in areas related to emotions and empathy in nulliparous women. *Hum Brain Mapp.* (2013) 34:1399–414. doi: 10.1002/hbm.21520
53. Main M, Solomon J. Procedures for identifying infants as disorganized/disoriented during the ainsworth strange situation. In: Cicchetti D, Cummings EM, Greenberg MT, editors. *Attachment in the Preschool Years: Theory, Research, and Intervention*. Chicago, IL: University of Chicago Press (1990). p. 121–60.
54. Benoit D, Parker K, Zeanah CH. Mothers' representations of their infants assessed prenatally: stability and association with infants' attachment classifications. *J Child Psychol Psychiatry.* (1997) 38:307–16. doi: 10.1111/j.1469-7610.1997.tb01515.x
55. Dayton CJ, Levendosky AA, Davidson WS, Bogat GA. The child as held in the mind of the mother: the influence of prenatal maternal representations on parenting behaviors. *Infant Ment Health J.* (2010) 31:220–41. doi: 10.1002/imhj.20253
56. Grossmann K, Grossmann KE, Fremmer-Bombik E, Kindler H, Scheuerer-Engelisch H, Zimmermann AP. The uniqueness of the child–father attachment relationship: fathers' sensitive and challenging play as a pivotal variable in a 16-year longitudinal study. *Soc Dev.* (2002) 11, 301–37. doi: 10.1111/1467-9507.00202
57. Barker B, Iles J, Ramchandani P. Fathers, fathering and child psychopathology. *Curr Opin Psychol.* (2017) 15:87–92. doi: 10.1016/j.copsyc.2017.02.015
58. Spielberger CD. *Manual for the State-Trait Anxiety Inventory STAI (form Y) ("Self-Evaluation Questionnaire")*. Palo Alto, CA: Consulting Psychologists Press (1983). doi: 10.1037/t06496-000
59. Pedrabissi L, Santinello M. *Inventario per l'ansia di Stato e di Tratto (forma Y)*. Florence: Organizzazioni Speciali (1989).
60. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item edinburgh postnatal depression scale. *Br J Psychiatry.* (1987) 150:782–6. doi: 10.1192/bjp.150.6.782
61. Benvenuti P, Ferrara M, Nicolai C, Valoriani V, Cox JL. The edinburgh postnatal depression scale: validation for an Italian sample. *J Affect Disord.* (1999) 53:137–41. doi: 10.1016/S0165-0327(98)00102-5
62. Ammaniti M, Candelori C, Pola M, Tambelli R. *Maternité et Grossesse*. Paris: Presses Universitaires de France (1999).
63. Biringen Z. *Emotional Availability Scales, 4th Edn*. Fort Collins, CO: Department of Human Development and Family Studies, Colorado State University (2008).
64. Main M, Goldwyn R. *Adult Attachment Interview scoring and Classification Systems*. Berkeley, CA: University of California at Berkeley (1997).
65. George C, Solomon J. The caregiving system: a behavioral systems approach to parenting. In: Cassidy J, Shaver PR, editors. *Handbook of Attachment: Theory, Research, and Clinical Applications, 2nd Edn*. New York, NY: Guilford (2008). p. 833–56.
66. Muthén LK, Muthén BO. *Mplus User's Guide, 8th Edn*. Los Angeles, CA: Muthén and Muthén (1998–2017).
67. Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. *Behav Res Methods.* (2009) 41:1149–60. doi: 10.3758/BRM.41.4.1149
68. Fritz MS, MacKinnon DP. Required sample size to detect the mediated effect. *Psychol Sci.* (2007) 18:233–9. doi: 10.1111/j.1467-9280.2007.01882.x
69. Heinicke CM, Diskin SD, Ramsey-Klee DM, Given K. Pre-birth parent characteristics and family development in the first year of life. *Child Dev.* (1983) 54:194–208. doi: 10.2307/1129877
70. Mayseless O. *Parenting Representations: Theory, Research, and Clinical Implications*. New York, NY: Cambridge University Press (2006). doi: 10.1017/CBO9780511499869
71. McFarland-Piazza L, Hazen N, Jacobvitz D, Boyd-Soisson E. The development of father–child attachment: associations between adult attachment representations, recollections of childhood experiences and caregiving. *Early Child Dev Care.* (2012) 182:701–21. doi: 10.1080/03004430.2011.573071
72. Madigan S, Hawkins E, Plamondon A, Moran G, Benoit D. Maternal representations and infant attachment: an examination of the prototype hypothesis. *Infant Ment Health J.* (2015) 36:459–68. doi: 10.1002/imhj.21527
73. Winnicott DW. Primary maternal preoccupation. In: Winnicott DW, editor. *Collected Papers: Through Pediatrics to Psycho-Analysis*. New York, NY: Basic Books (1956). p. 300–5.
74. Leckman JF, Feldman R, Swain JE, Eicher V, Thompson N, Mayes LC. Primary parental preoccupation: circuits, genes, and the crucial role of the environment. *J Neural Transm.* (2004) 111:753–71. doi: 10.1007/s00702-003-0067-x
75. Trentini C, Pagani M, Lauriola M, Tambelli R. Neural responses to infant emotions and emotional self-awareness in mothers and fathers during pregnancy. *Int J Environ Res Public Health.* (2020) 17:3314. doi: 10.3390/ijerph17093314
76. Schoppe-Sullivan SJ, Brown GL, Cannon EA, Mangelsdorf SC, Sokolowski MS. Maternal gatekeeping, coparenting quality, and fathering behavior in families with infants. *J Fam Psychol.* (2008) 22:389–98. doi: 10.1037/0893-3200.22.3.389
77. Lebovici S, Stoléru S. *Le Nourrisson, la Mère et le Psychanalyste. Les Interactions Précoces*. Paris: Le Centurion (1983).
78. Maxwell SE, Cole DA. Bias in cross-sectional analyses of longitudinal mediation. *Psychol Methods.* (2007) 12:23. doi: 10.1037/1082-989X.12.1.23
79. Witte AM, Bakermans-Kranenburg MJ, van IJzendoorn MH, Szepeswöl O, Shai D. Predicting infant–father attachment: the role of pre-and postnatal triadic family alliance and paternal testosterone levels. *Attach Hum Dev.* (2020) 22:653–67. doi: 10.1080/14616734.2019.1680713
80. Stern DN. *The Present Moment in Psychotherapy and Everyday Life*. New York, NY: Norton (2004).

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Copyright © 2020 Tambelli, Trentini and Dentale. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

Advantages of publishing in Frontiers



OPEN ACCESS

Articles are free to read
for greatest visibility
and readership



FAST PUBLICATION

Around 90 days
from submission
to decision



HIGH QUALITY PEER-REVIEW

Rigorous, collaborative,
and constructive
peer-review



TRANSPARENT PEER-REVIEW

Editors and reviewers
acknowledged by name
on published articles

Frontiers

Avenue du Tribunal-Fédéral 34
1005 Lausanne | Switzerland

Visit us: www.frontiersin.org

Contact us: frontiersin.org/about/contact



REPRODUCIBILITY OF RESEARCH

Support open data
and methods to enhance
research reproducibility



DIGITAL PUBLISHING

Articles designed
for optimal readership
across devices



FOLLOW US

@frontiersin



IMPACT METRICS

Advanced article metrics
track visibility across
digital media



EXTENSIVE PROMOTION

Marketing
and promotion
of impactful research



LOOP RESEARCH NETWORK

Our network
increases your
article's readership