

# Mental health difficulties across childhood and mental health service use: findings from a longitudinal population-based study

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## Background

Over the past 20 years the prevalence of child and adolescent mental disorders in high-income countries has not changed despite increased investment in mental health services. Insufficient contact with mental health services may be a contributing factor; however, it is not known what proportion of children have sufficient contact with health professionals to allow delivery of treatment meeting minimal clinical practice guidelines, or how long children experience symptoms prior to receiving treatment.

## Aims

To investigate the level of mental healthcare received by Australian children from age 4 years to 14 years.

## Method

Trajectories of mental health symptoms were mapped using the Strengths and Difficulties Questionnaire. Health professional attendances and psychotropic medications dispensed were identified from linked national Medicare Benefits Schedule (MBS) and Pharmaceutical Benefits Scheme records.

## Results

Four trajectories of mental health symptoms were identified (low, high-decreasing, moderate-increasing and high-

increasing). Most children with mental health symptoms had few MBS mental health attendances, and only a minority received care meeting study criteria for minimally adequate treatment. Children in the high-increasing and moderate-increasing trajectories were more likely to access care, yet there was no evidence of improvement in symptoms.

## Conclusions

It is important that children and adolescents with mental health problems receive treatment that meets minimal practice guidelines. Further research is needed to identify the quality of care currently provided to children with mental health difficulties and how clinicians can be best funded and supported to provide care meeting minimal practice guidelines.

## Declaration of interests

None.

## Keywords

Health service use; children; adolescents; mental health.

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Over the past 20 years there has been little change in the prevalence of child and adolescent mental disorders reported in many countries.<sup>1</sup> One reason why the prevalence of mental disorders has not decreased, despite an increased investment in and use of new resources, is that the quality and the intensity of services provided have not improved.<sup>2</sup> For example, in the second national Australian Child and Adolescent Survey of Mental Health and Wellbeing, 79% of parents reported that their child needed help but of these, only 35% indicated that their needs were fully met.<sup>3</sup> The majority of prior research has been cross-sectional, has used retrospective parent recall to measure service use and has estimated rates of service use over relatively short periods of time (i.e.  $\leq 12$  months). There are several major limitations to such approaches, including recall bias and that the extent of children's mental health problems is assessed after the service use. Further, cross-sectional studies cannot define the trajectory of children's mental health symptoms in relation to service use thus it is not known how long a child has symptoms prior to accessing services, or whether symptoms were improving, worsening or relatively stable prior to service contact.

Additionally, previous work has focused primarily on describing proportions of children who access any care and predictors of service utilisation versus non-utilisation. We know that a single visit to a healthcare provider is unlikely to be adequate to shift a child's trajectory or treat their problem. Yet it is not known what proportion of children receive what could be considered a minimally adequate number of visits that could meaningfully alter their outcomes. The concept of 'minimally adequate treatment' (MAT) has been used in research investigating mental health services for adults.<sup>4–6</sup> This concept is based upon clinical guidelines for treatment of common mental health problems. For

medications, MAT is defined as four to seven sessions with a health professional within a 12-month period and for non-pharmacological treatment (with or without medication) as eight or more sessions with a health professional within a 12-month period.<sup>4–6</sup> Although this definition was created for use with adults, it is consistent with many of the UK National Institute for Health and Care Excellence guidelines for treatment for childhood mental health problems.

## Aims

The current study aims to address several of the limitations of prior research by using a nationally representative cohort study, with linked national healthcare data and prospective measurement of service use over time. Specifically, we aim to: (a) describe the number of attendances with health professionals for children and young people with different trajectories of mental health problems over a 10-year period from age 4 to 14 years; and (b) identify the proportion of children with different trajectories of mental health problems who receive at least one episode of care meeting study criteria for MAT during this 10-year period, including which health professional(s) provide such care.

## Method

### Study design and participants

Data were drawn from waves one to six (2004–2014) of the Longitudinal Study of Australian Children (LSAC) kindergarten

cohort. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving patients were approved by the Australian Institute of Family Studies (AIFS) Ethics Committee, and we have permission from the AIFS to access the data-set for this study. Detailed information about the study design is provided elsewhere.<sup>7</sup> Briefly, a two-stage sample design was used. First, 10% of Australian postcodes were sampled after stratifying by state and urban versus rural status to ensure proportional geographic representation. Second, a number of children proportional to population size were randomly selected from each postcode using the Medicare database (which included 98% of all children). At wave 1, 4983 children aged 4–5 years and their families were recruited into the study. Written informed consent was obtained from all participants. Children from non-English speaking families and those living in rental properties were underrepresented, whereas children with more highly educated parents were over-represented. Follow-up occurred every 2 years when the children were aged 6–7 years (wave 2), 8–9 years (wave 3), 10–11 years (wave 4), 12–13 years (wave 5) and 14–15 years (wave 6). At wave 6 the total number of participants was 3764, representing a retention rate of 76%.

## Measures

In Australia, services available for children with mental health problems include services funded by the federal government's Medicare Benefits Scheme (MBS) such as attendances to general practitioners (GPs), and to specialists working in private practice (paediatricians, psychiatrists, psychologists and other allied health professionals). Other services are funded by state governments (for example hospital psychologists and child and adolescent mental health services (CAMHS)). As such, these services are not captured in MBS data. In addition, the Australian federal government subsidises the cost of medications, including psychotropic medications, through the Pharmaceutical Benefits Scheme (PBS).

### Mental health service use

Mental health service use was measured through linked child MBS utilisation data from child age 4 to 14 years.<sup>8</sup> Within the MBS, services are assigned a specific 'item number' corresponding to the health professional who provided the service and the type of service provided. We included the following health professional categories/services of MBS items to construct our mental health service use outcome: (a) GP mental health assessment and/or treatment; (b) psychologist; (c) psychiatrist; (d) family therapy; and (e) allied health (occupational therapist or social worker) delivery of focused psychological strategies. We also included attendances to paediatricians given that approximately 60% of visits to paediatricians in Australia involve treatment of behavioural/developmental issues.<sup>9</sup> However, MBS items do not provide specific information about whether children attending paediatricians did so for mental or physical health problems. To address this, we repeated analyses excluding attendances to paediatricians. The results of these analyses are reported in supplementary Table 1 available at <https://doi.org/10.1192/bjp.2019.32>.

### Psychotropic medication use

Psychotropic medication use was measured through linked child PBS data<sup>8</sup> of whether children redeemed a prescription during the study period for any psychotropic medications. Within LSAC the psychotropic medications redeemed through the PBS included: antidepressants, antipsychotics, attention-deficit hyperactivity disorder

medications (methylphenidate, dexamphetamine, or atomoxetine), benzodiazepines, clonidine and anti-epileptics/mood stabilisers.

### MAT

MAT was defined as 4–7 MBS-funded attendances plus medication or ≥8 attendances (with or without medication) within a 12-month period.<sup>4,5</sup>

### Mental health problems

Mental health problems were measured by the Strengths and Difficulties Questionnaire (SDQ), a widely used and validated 25-item measure of child social, emotional and behavioural functioning.<sup>10</sup> Each item is rated on a three-point scale from 'not true' to 'certainly true', with higher scores indicating more problems. We used the 20-item total problems subscale; possible scores range from 0 to 40. The SDQ total score can be categorised into 'normal' (scores ranging from 0 to 13), 'borderline' (scores ranging from 14 to 16) and 'abnormal' (scores ranging from 17 to 40). Children scoring in the abnormal range are 15 times more likely to meet criteria for a mental health disorder than children whose scores fall in the normal range.<sup>10</sup>

### Demographic characteristics

Demographic characteristics were measured at wave 1 and used to describe the sample. Family socioeconomic position (SEP) was estimated by a composite variable derived by ranking each family's relative SEP based on combined household parental income, education and occupational prestige.<sup>11</sup> The unweighted average variable was then standardised to have a mean of zero, and standard deviation of one. Higher scores represent a better socioeconomic position. Neighbourhood SEP was measured by the Socio-Economic Indexes for Areas<sup>12</sup> Relative Disadvantage Index (higher scores reflect less disadvantage (population mean 1000, s.d. = 100)). Parent mental health was estimated using the self-reported Kessler-6 (K6) scale. The K6 is a standardised and validated measure of psychological distress.<sup>13</sup> Higher scores reflect more distress. Family type (single versus two-parent home), main language spoken at home (English versus other), child gender and age, primary caregiver age and high-school completion were also measured.

## Data analysis

Latent class growth analysis (LCGA) using MPlus Version 8.1<sup>14</sup> was conducted to identify distinct subgroups of children based on their trajectory of mental health problems across six waves (from age 4 to 14 years). In order to maximise robustness of trajectories participants were only included in the LCGA if they had data available from at least three waves. LCGA involves identifying the smallest number of classes that fit the data, starting with a parsimonious one-class model and fitting successive models with increasing numbers of classes. Model solutions were evaluated based on several criteria including: (a) model fit indices; (b) relative entropy; and (c) the Vuong–Lo–Mendell–Rubin likelihood-ratio test. Better fitting models have a lower likelihood-ratio statistic ( $L^2$ ), Bayesian information criterion (BIC) and Akaike information criterion (AIC). Entropy is an index for assessing the precision of assigning latent class membership, where higher probability values indicate greater precision of classification. The Vuong–Lo–Mendell–Rubin likelihood-ratio test was also used to test for significant differences in fit between the models.

Initial analyses describe the general pattern of attendances participating children have with MBS-funded health professionals by each trajectory from the time when children were aged 4 years until they were aged 14 years. We then describe the proportion of

children in each trajectory who attended GPs for a mental health visit, psychologists, psychiatrists and paediatricians during each 2-year block of time between waves. Finally, we describe the proportion of children in each trajectory who met study criteria for MAT across the 10-year study period and in between each wave.

## Results

### Participant characteristics

Of the 4983 families recruited into the study, 635 (12.7%) were missing SDQ data from more than three waves of data collection, resulting in the final sample for analysis of 4348 children. Children excluded from the analyses were more likely to have parents with lower educational attainment, be from a single-parent home, be from non-English speaking backgrounds, be of lower SEP, have younger parents with poorer mental health and have higher levels of mental health problems compared with children in the final sample (see supplementary Table 2).

### Trajectories of mental health problems across childhood

Mean SDQ total problems scores for waves 1–6 were 9.2 (s.d. = 5.2), 7.8 (s.d. = 5.0), 7.5 (s.d. = 5.3), 7.9 (s.d. = 5.6), 7.4 (s.d. = 5.5), 7.1 (s.d. = 5.4), respectively. Latent growth class models specifying one to five trajectories were estimated (supplementary Table 3). The four-class model was accepted as the final model as the fit indices ( $L^2$ , BIC, and AIC) were lower than the one to three class models. Further the Vuong-Lo-Mendall-Rubin likelihood-ratio test indicated a significant difference between the three- and four-class models, indicating that the latter gives significant improvement in model fit over a three-class model. The model fit for the five-class model did not significantly improve on the four-class model and was therefore not chosen.

Figure 1 illustrates the four trajectory classes of mental health problems. The first trajectory contained the largest number of children and was labelled 'low symptoms'. It comprised children who had a consistently low level of mental health problems over the 10 years of the study ( $n = 3223$ , 74.1%, mean SDQ scores of 4.8–7.9). The second trajectory consisted of children with 'high-decreasing

symptoms' ( $n = 265$ , 6.1%, mean SDQ scores decreasing from 17.2 to 10.7). The third trajectory consisted of children with 'moderate-increasing symptoms' ( $n = 692$ , 15.9%, mean SDQ scores increasing from 10.5 to 13.8). The final trajectory consisted of children with 'high-increasing symptoms' ( $n = 168$ , 3.9%, mean SDQ scores increasing from 16.6 to 22.1).

### Trajectories of mental health problems and mental health service use

The proportion of children who had attended a health professional varied for children with different trajectories of mental health problems (Table 1). Approximately 50% of children in the moderate-increasing and high-decreasing trajectories, and 80% of children in the high-increasing symptoms trajectory attended a health professional at some point in the 10 years. In contrast, 30% of children in the low-symptoms trajectory had attended a health professional during this time. The median number of visits to health professionals was three in the low-symptoms trajectory, five in the high-decreasing trajectory, six in the moderate-increasing trajectory and ten in the high-increasing trajectory. In the latter trajectory, this equates to an average of one visit per year for children who were experiencing persistently high, worsening mental health problems. When paediatrician attendances were excluded from our definition of mental health service use, the overall pattern of results remained the same but the number of attendances declined (supplementary Table 1).

Figure 2 shows the proportion of children who had at least one MBS-funded mental health attendance between each wave of data collection for children in each trajectory. The proportion of children in the moderate-increasing and high-increasing trajectories attending health professionals tends to increase with age, although the effect is more pronounced when paediatrician attendances are excluded from the analysis (Fig. 2(b)). Children in the highest symptom trajectory were most likely to see a health professional. Supplementary Fig. 1 shows attendances by profession type. Attendances were most common to paediatricians, followed by GPs and psychologists; there were few attendances to psychiatrists.

### Trajectories of mental health problems and MAT

The proportion of children receiving MAT at any point during the 10-year study period varied according to symptom trajectory

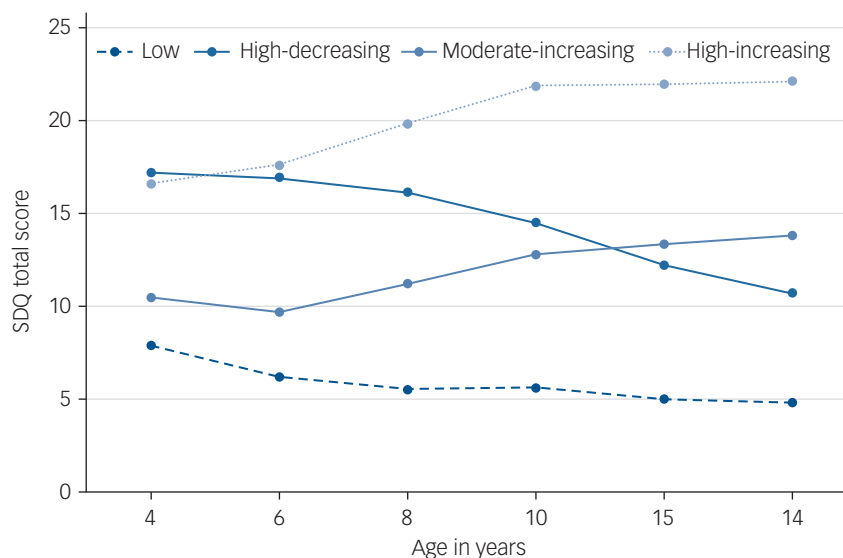


Fig. 1 Estimated means on the Strengths and Difficulties Questionnaire total problems subscale for the trajectories of mental health problems in childhood.

**Table 1** Proportion of children in each trajectory who had a Medicare Benefits Schedule-funded mental health attendance from age 4 to 14, and median (range) number of visits among those who had a contact

Trajectory	Proportion with one or more MHS contacts, % (n)	Number of contacts, <sup>a</sup> median (range)
Low symptoms	29.5 (951)	3 (1–74)
High-decreasing symptoms	49.8 (132)	5 (1–83)
Moderate-increasing symptoms	53.6 (371)	6 (1–72)
High-increasing symptoms	81.0 (136)	10 (1–73)

a. Among children with at least one contact.

(Table 2). Few children in the low-symptoms trajectory received an episode of MAT, which is appropriate given their low levels of symptoms. In contrast, approximately 38% of children in the high-increasing symptoms trajectory received an episode of MAT. Supplementary Table 4 shows the proportion of children in each trajectory who received MAT by profession type. Paediatricians were most likely to have delivered MAT to children in the high-increasing symptoms trajectory (26%), followed by psychologists (17%), psychiatrists (5%) and GPs (3%).

Supplementary Table 5 shows the proportion of children in each trajectory who received an episode of MAT between each 2-year wave of data collection across the 10 years of the study. Between each wave, 10–14% of children in the high-increasing trajectory received MAT. Few children in the high-decreasing or moderate-increasing trajectories received MAT, although there was a slight increase in MAT in adolescence for those in the moderate-increasing trajectory with 7% of children receiving MAT between 12 and 14 years.

## Discussion

### Main findings

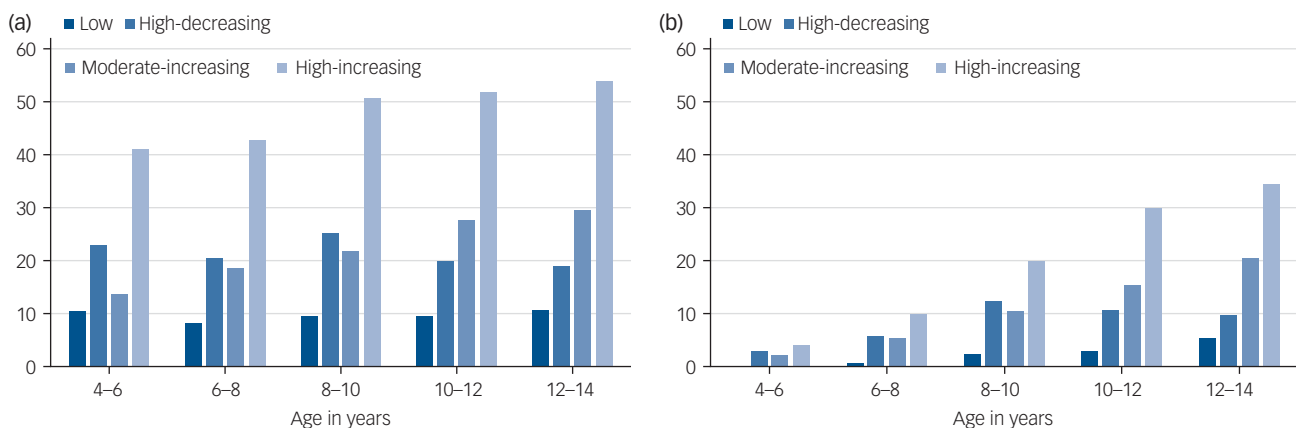
This is the first study to describe the attendance to health professionals for mental health problems in a large, population-based sample of Australian children from age 4 to 14 years, by symptom trajectory. We found four distinct groups of trajectories of children's mental health problems over the 10 years. Among children who had a high level of problems at 4 years and whose problems then increased over the next 10 years, 38% had an episode of care that

met MAT standards. Most children with mental health symptoms had no MBS mental healthcare attendances from age 4 to 14 years.

Children in the high-increasing and moderate-increasing symptom trajectories were more likely to access care (a pattern seen in previous studies<sup>15,16</sup>) than children with low or high-decreasing symptoms. However, there was no evidence of improvement in symptoms over time for these children. This may reflect our finding that few children (only 38% and 17%, respectively) in these trajectories received an episode of MAT. We are unable to determine with the available data whether the care a child received when attending a health professional is evidence based. Thus, it may be that, in addition to an insufficient quantity of care, children are not receiving quality care and that this also contributes to their symptom trajectory failing to shift. The minority of children in the high-decreasing trajectory had a mental health contact and very few received an episode of MAT. It may be that this is a group of children whose symptoms naturally resolved over time. Alternatively, they may have accessed treatment that is not captured in our data such as school counselling.

There was an effect of age, such that older children were more likely to have contact with mental health services, although this did not seem to have an impact on whether children received MAT. Further, younger children were most likely to see a paediatrician with few children under the age of 8 years seeing any other health professional for mental health treatment. This points to the key role that paediatricians play in identifying and managing mental health problems particularly in young children. In 2006 there was a significant policy change whereby the Australian federal government began to provide rebates for psychology services. As such it is possible that the increase in service use in children over the age of 6 compared with those aged 4–6 years is because of a cohort effect rather than an age effect.

In this study we used MAT as a marker of the likelihood that a child is receiving evidence-based care. Of note, very few children met standards for MAT without medication. This may indicate that only the most unwell children receive MAT. Further, MAT is based on the minimum number of appointments a child would need to attend to have received care consistent with clinical guidelines. Thus, our finding of no shift in symptom trajectory may reflect that most children are not receiving a high enough dosage or treatment sustained over a long enough period of time to meaningfully have an impact on their symptoms. The healthcare system in Australia rewards discharging patients within a set number of appointments rather than once they have improved. There is a

**Fig. 2** Proportion of children in each trajectory that had at least one mental health attendance in between each wave of data collection. (a) including paediatrician attendances, and (b) excluding paediatrician attendance.

Low symptoms  $n = 3223$ , high-decreasing symptoms  $n = 265$ , moderate-increasing symptoms  $n = 692$ , high-increasing symptoms  $n = 168$ .



**Table 2** Percentage (n) of children meeting lifetime criteria for minimally adequate treatment by trajectory

Nature of contact <sup>a</sup>	Low symptoms (n = 3223)	High-decreasing symptoms (n = 265)	Moderate-increasing symptoms (n = 692)	High-increasing symptoms (n = 168)
Met criteria, % (n) <sup>b</sup>	3.4 (111)	13.2 (35)	16.6 (115)	38.1 (64)
4–7 visits + medication	0.7 (21)	4.5 (12)	5.6 (39)	20.2 (34)
≥8 visits + no medication	2.5 (81)	6.0 (16)	7.7 (53)	7.1 (12)
≥8 visits + medication	0.3 (9)	2.6 (7)	3.3 (23)	10.7 (18)
Did not meet criteria, % (n) <sup>c</sup>				
1–3 visits	21.2 (684)	23.4 (62)	26.2 (181)	31.5 (53)
4–7 visits + no medication	4.8 (156)	13.2 (35)	10.8 (75)	11.3 (19)
No contact, % (n)	70.5 (2272)	50.2 (133)	46.4 (321)	19.0 (32)

a. Reports the highest level of treatment for children visiting more than one health professional; ≥8 visits + medication was deemed a higher level of treatment than ≥8 visits + no medication. Includes visits to psychologists, paediatricians, psychiatrists, general practitioners, occupational therapists and social workers.  
b. Within a 12-month period: 4–7 visits with a health professional plus medication, or ≥8 visits with or without medication.  
c. Within a 12-month period: 1–3 visits or 4–7 visits without medication.

need for a system-level shift to funding based on measured symptom improvement rather than a capped number of appointments. In order to do this harmonised outcome measures need to be implemented across services and clinicians would need to collect outcome data as part of routine practice.

### Strengths and limitations

Our study has overcome a number of limitations in previous literature examining service use in children with mental health problems. We used data from a large population study with data linkage to objective administrative records of health service use and prescription data recorded at the time these services were provided. The longitudinal design of the study overcomes many limitations of previous literature as it enables an understanding of how children's service use relates to their symptoms over time and examination of the frequency and intensity of service use, captured here as episodes of MAT, rather than a binary outcome of services accessed or not.

However, our study also has limitations. We did not include attendances to non-MBS rebated professionals (for example school counselling, state-funded CAMHS) and will therefore have underestimated the amount of care provided. We cannot distinguish in the data-set between visits to a paediatrician for physical or mental health concerns. This is likely to have resulted in us overestimating the care given for mental health problems by paediatricians. However, the patterns of findings still held even when excluding paediatrician services from the analyses. Our findings may not generalise to disadvantaged populations that were underrepresented in the data. This is important as children from disadvantaged backgrounds are both more likely to experience mental health difficulties<sup>17</sup> and less likely to access services.<sup>3</sup> Finally, while our definition of MAT begins to provide evidence about the proportion of children who are receiving appropriate treatment for their mental health difficulties it is only in terms of number of visits and/or medication use. It is not known whether the treatment provided is evidence based and effective.

### Implications

In conclusion, a large proportion of Australian children with persisting, and worsening, high levels of mental health problems do not receive care meeting minimal treatment guidelines. A total of 50% of mental health disorders have an onset prior to 14 years of age.<sup>18</sup> Our results demonstrate that the majority of children under the age of 14 that are experiencing elevated symptoms of mental health problems are not receiving adequate care. These children likely continue to experience mental health problems into adolescence and adulthood. Thus, there is a clear need to provide better access to services for children and adolescents with mental health difficulties. To do so will likely require improved parental awareness

of mental health services for children and funding to support families to access MAT episodes. Further research is needed to identify the quality of care provided to children with mental health difficulties and how clinicians can be best supported to provide care consistent with clinical treatment guidelines.

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### Supplementary material

Supplementary material is available online at <https://doi.org/10.1192/bjp.2019.32>.

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## psychiatry in history

### Jacob L. Moreno and psychodrama

Michele Augusto Riva , Luca Grassi and Michael Belingheri 

Psychodrama is a method used in psychotherapy, in which patients dramatise their lives to explore and solve personal problems. The Romanian–American psychiatrist Jacob Levy Moreno (1889–1974), the father of modern psychodrama, conducted the earliest experiments on this subject in Vienna in 1911, working with children in the *Stegreiftheater* (Theatre of Spontaneity). Moreno did not accept the psychotherapeutic approach of the time: as a medical student, he attended a lecture by Sigmund Freud in 1912; when Freud approached him, asking his occupation, he replied, ‘Well, Dr Freud, I start where you leave off. [...] You analyse their dreams; I try to give them the courage to dream again. I teach the people how to play God’. Moreno gave the birthday of psychodrama as 1 April 1921 – April Fool’s Day, as he specified later. On that date the psychiatrist staged a drama without actors at the Viennese Komödienhaus (comedy house), proposing that the spectators themselves were actors and directors of the presentation. Despite the harsh criticism of Austrian society, Moreno continued his experiments, focusing this time on adults. His ‘spontaneity theatre’ was turning into a ‘therapeutic theatre’, as shown by the case of the actress Barbara, accurately described by the psychiatrist. She improved the relationship with her husband thanks to the role specifically given by Moreno in cathartic representation on the stage.

Moreno emigrated to the USA in 1925 and first demonstrated therapeutic theatre there in 1927. He came into contact with the academic world in New York City, introducing the concept of group psychotherapy and sociometry to the American Psychiatric Association. In particular, he successfully conducted group therapy in schools and prisons, including Sing Sing. In 1936 he opened the first psychodrama theatre at the Beacon Hill Sanatorium; the first theatre of psychodrama in a public hospital opened in June 1941. In 1942 Moreno founded the American Society of Group Psychotherapy and Psychodrama. Between 1936 and 1953 he wrote mainly on the major concepts and methods of sociometry and psychodrama. Finally, he was appointed an adjunct professor in the Department of Sociology at New York University (1951–1966) and special lecturer at various universities in North America, continuing his studies until his death in 1974.

Moreno claimed to have moved analysis and the treatment of mental illness out of the psychotherapist’s office. Indeed, he believed that the complexity of the human psyche could not be represented by static images, but it required the action of the theatre, which allowed the individual to become aware of their condition and to critically observe it through fiction. In his opinion, this process was allowed by the fall of narcissistic defences that were an obstacle to the application of psychotherapy, including Freud’s psychoanalysis. The original theory of psychodrama proposed by Moreno in 1921 has been reinterpreted by several authors over recent decades. The absence of clear definitions has resulted in a diversity of applications of Moreno’s techniques and concepts. So, as noted in a 2018 review by Cruz *et al* (<https://doi.org/10.3389/fpsyg.2018.01263>), ‘almost 100 years after its foundation psychodrama still lacks theoretical and technical coherence within the international clinical community’.

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