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Predicting service use for mental-health problems among young children. A prospective cohort study

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Short title: Preschool predictors of service use

Abbreviations: ADHD – attention-deficit/hyperactivity disorder; ODD - oppositional defiant disorder; CD - conduct disorder; CAMHS - child and adolescent mental-health service; SES - socioeconomic status

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Conflict of Interest: The authors have no conflicts of interest to disclose.

What's Known on This Subject: A large majority of preschool and young school age children with mental health problems do not receive services and little is known about the determinants of service in this age group.

What This Study Adds: Behavioral, not emotional, disorders increase service use but only if impairment results. Such impairment may in turn operate via increased parental burden and parent and caregiver problem recognition. Low SES has an independent effect on service use.

Contributors' Statement

Dr. Wichstrøm conceptualized and designed the study, drafted the initial manuscript, analyzed the data, and approved the final manuscript as submitted.

Drs. Belsky and Berg-Nielsen co-designed the study, critically reviewed and revised the manuscript and approved the final manuscript as submitted.

Drs. Jozefiak and Sourander reviewed and revised the manuscript, and approved the final manuscript as submitted.

Abstract

Objective: To identify sociodemographic, child, parent, and day-care provider factors at age 4 that predict Norwegian children's service use for mental-health problems at age 7.

Method: Two birth cohorts of 4-year old children and their parents living in the city of Trondheim, Norway, were invited (82.0% consented). We successfully interviewed 995 parents among 1,250 drawn to participate using the Preschool Age Psychiatric Assessment to set diagnoses and record parental burden and service use. Information concerning sociodemographics, child impairment, parental social support, and child's need for mental-health services according to parents, day-care teacher, and health nurse were obtained.

Results: Rate of service use among those with a behavioral or emotional disorder was 10.7% at age 4 and 25.2% at age 7. Behavioral disorders (O.R.=2.6, CI:1.3-5.3), but not emotional disorders predicted service use. When adjusted for incapacity (O.R.=1.3, CI:1.2-1.6), disorders were no longer predictive. Incapacity, in turn, was not predictive once parental burden (O.R.=1.1, CI:1.0-1.1) and parents' (O.R.=2.7, CI: 1.0-7.9) and day-care teachers' (O.R.=2.1, CI: 1.4-3.2) judgment of child need of help were included. Lower SES predicted more service use over and beyond these factors in this Norwegian sample (O.R.=3.0, CI: 1.5-6.1).

Conclusions: Behavioral disorders may instigate service use if they result in impairment; and such impairment may operate via increased parental burden and parent and caregiver problem recognition. Service use may be increased through effective screening programs and efforts to increase day-care teachers' recognition of emotional problems.

Introduction

Current population studies from the USA and Europe indicate that between 7% and 36% of pre-school and young school-age children have a diagnosable psychiatric disorder,^{1,3} and these rates are comparable to those of older school children and adolescents.⁴ The overall level of service use among pre-school and young school-age children range from 3% to 20% among those with a mental disorder,^{1,5-7} a rate which may be even lower than for older school-age children.^{8,9} Because effective treatments are available for young children, efforts should be made to increase service use among those with unmet needs. Although important research has been carried out on older children's service use, there is remarkable little on young children. Such work is thus needed because service use for young children's mental-health problems may be driven by other factors than those influencing service use by older children and adolescents and because the mental-health needs of young children may be different.¹ Moreover, relative to parents of older children, those with younger offspring may be more reluctant to label problems as symptoms of a psychiatric disorder. Thus, when children are younger parents may experience less burden, partly because problems are still recent and/or are not severe enough to impair the social life of the family. Finally, parents of younger children may be more inclined to seek out non-professional advice. Hence, findings from studies of older children cannot simply be extrapolated downwards. Two pediatric or community studies have addressed predictors of service use in young children; one US study identified comparatively older age of the child, having a diagnosis, family conflict, and referral from a pediatrician as factors increasing the odds of psychiatric service use⁶ whereas a study from New Zealand only found hyperactivity to predict any help-seeking (including non-professional).¹⁰

In the current research we extend the above studies by examining a wide set of predictors stemming from theoretical models of health service use.^{12,13} Such models are, broadly speaking, of two (partly overlapping) types. The first may be termed "predictor-models" addressing the question "Who will seek help?" Although there are notable differences between various predictor models they converge in underlining the (1) medical needs of the person; (2) predisposing social factors; (3) personal enabling factors or barriers; (4) contextual enabling factors or barriers; and (5) use of alternatives to the formal service system. The second type of model, which can be termed "process models" conceptualize help-seeking as a process.^{11,12} Such models typically involve (1) a recognition phase in which the person labels the condition as a problem/disorder, (2) then an attribution-analysis phase focusing on the causes of the problem (e.g., fate, genetics, bullying) and, finally, (3) a search phase in which problem solutions are explored. Solutions may involve self-help or help from others – professional or otherwise. Combining predictor and process models we thus evaluated whether the following factors measured at age 4 predict service use at age 7, adjusting for age-4 service use: (i) child needs (i.e., disorders and

incapacity); (ii) socio-demographic factors (i.e., family composition, SES, child gender); (iii) parental factors (i.e., experience with own treatment and social support); and (iv) burden and problem recognition (i.e., perceived burden to parents, problem recognition by parents, teachers, and health nurses).

Method

Participants and recruitment

Participants were part of the Trondheim Early Secure Study (TESS)² which includes two birth cohorts (born in 2003 or 2004) of 4-year olds living in the city of Trondheim, Norway, and their parents, to which 2,475 (82.0%) consented. The recruitment process and the follow-up are described elsewhere.^{2,13} The total difficulties score of the Strengths and Difficulties Questionnaire (SDQ) 4-16 version,^{14,15} was used for screening; scores were divided into four strata: 0-4, 5-8, 9-11, and 12-40. Defined proportions of parents in each stratum (0.37, 0.48, 0.70, and 0.89, respectively) were invited to participate (n=1,250), and we succeeded in interviewing 995 parents (79.6%). Parental educational level was generally high (6.7% without high-school diploma; 17.3% high-school graduates; 17.2% some post high-school education, 58.3% college graduates). The drop-out rate after consenting at the well-child clinic (T1) was unrelated to the SDQ, $t(1,250)=.28$, $p=.78$ or gender, $\text{Chi-sq}=0.23$, $df=1$, $p=.37$. The mean age of the children was 4.4 years ($SD=.18$) at T1 and 6.7 years ($SD=.25$) at T2. Attrition from T1 to T2 was selective according to parental low SES, $\chi^2=12.89$, $df=1$, $p<.001$; parents not living together, $\chi^2=9.95$, $df=1$, $p=.002$; parental burden, $t(998)=2.62$, $p=.009$; and perceived need for help according to the health nurse, $t(998)=3.08$, $p=.002$. Collectively, these variables explained 2.1% of the attrition according to Cox & Snell proxy R^2 .

Setting

Trondheim is the third largest city in Norway with approximately 200,000 inhabitants. The three main professional service provisions to children for mental health-problems are (i) school counseling, which also deliver services to day-care centers, (ii) community health service and family physicians, and (iii) child and adolescent mental-health service (CAMHS). Health care for children is free of charge. In all, 5.2% of the population aged 0-19 years received help from CAMHS each year in the years 2008-2009.¹⁶ The figure for children aged 0-5 years was 1.8%.

Procedure

Research procedures were approved by the Regional Committee for Medical and Health Research Ethics. During the age-4 health checkup at the community health center, nurses informed parents about the study and obtained informed consent. Parents completed a structured diagnostic interview about their child's symptoms and day-care teachers filled out a questionnaire. Retesting took place two years later (T2).

Measures

Service use. Parents were interviewed with the Child and Adolescent Service Assessment (CASA).⁹ Through CASA information was obtained concerning which services the child had received help from for symptoms being present during the preceding 3 months (see Table 1).

Need: Child psychiatric disorders. The Preschool Age Psychiatric Assessment (PAPA)¹⁷ is a psychiatric interview using a structured protocol involving both required and optional follow-up questions. Diagnoses are generated by computer algorithms using criteria of the Diagnostic and Statistical Manual of Mental Disorders (fourth edition) (DSM-IV).¹⁸ Diagnoses were set without impairment criteria because impairment was separately entered into the model. Nine percent of the interview audio recordings were rescored by blinded raters. A group of behavioral disorders was created consisting of Attention-Deficit/Hyperactivity Disorder (ADHD), ODD and CD ($k=.84$). A group of emotional disorders was also created consisting of Major Depression (MDD), dysthymia, depression not otherwise specified (NOS), Separation Anxiety Disorder (SAD), Generalized Anxiety Disorder (GAD), social phobia, specific phobia, agoraphobia, selective mutism, and Obsessive-Compulsive Disorder (OCD) ($k=.86$); 'Any disorder' included behavioral, emotional, elimination, and sleep disorders ($k=.83$). The assessment of *impairment* (disability) in 19 areas of functioning (e.g., relationship to parents, siblings, peers, and teachers, school functioning) resulting from each group of symptoms was based upon the World Health Organization's International Classification of Functioning, Disability and Health (ICC=.83).¹⁹

Socio-demographic factors. To assess family socioeconomic status (SES), parental occupations were coded according to the International Classifications of Occupations.²⁰ Professionals and leaders were grouped together as being of "high" socio-economic status (SES), whereas farmers/fishermen, skilled and unskilled workers were grouped as "low" SES. Married or cohabitating parents (> 6 months) were distinguished from others.

Parental factors. We constructed a measure of parents' social support modeled after the Social Support Questionnaire.²¹ Specifically, a composite score of social support with respect to two instrumental, two informational, and two emotional support areas was calculated ($\alpha=.86$). Parents were also asked if one or both parents had ever received treatment for mental health problems (yes/no).

Burden and problem recognition. Burden to parents and the family in 20 areas (e.g. problems in relationship with family or social network members, restriction on activities, and decreased feelings of well-being) judged to be caused by the child's symptoms was recorded on a 3-point scale using the Child and Adolescent Impact Assessment (CAIA)⁹ (ICC=.95). Parents also reported whether they perceived their child to be in need of services (yes/no, $k=.97$). In addition, the child's health nurse was asked, using a 5-point scale, to rate whether she considered the child to be in need of professional help for emotional, behavioral or social problems. Day-care teachers completed the

teacher version of the SDQ,¹⁴ which also involved ratings of the extent to which the preschool teacher considered the child in need of professional help.

Statistical analysis

The predictors of service use at T2 using T1 variables were investigated by means of logistic regression analysis involving five steps. In Step 1 service use at T1 as well as emotional and behavioral disorders were entered. Next, in Step 2, resulting incapacity was entered, and in Step 3 back-ground factors were added (i.e., child gender, parental SES, and divorce). In Step 4 parental factors were included (i.e., received treatment for mental-health problems and satisfaction with social support). Finally, in Step 5, parental perceived burden and parents', teachers', and health-nurse's perception of the child as being in need of professional help, respectively, were introduced. Because we had screen-stratified the sample, we conducted weighted analyses using weights proportional to the inverse of the drawing probability. Robust confidence intervals were estimated using the Horvitz-Thompson estimator.

Results

Prevalence

The prevalence of service use for symptoms or disorders present during the last three months doubled from age 4 to age 7 (Table 1). This increase should be seen in the context of unaltered prevalence rates for emotional and behavioral disorders (T1: 11.1%; T2: 12.4%). At age 4 the prevalence of service use among those having at least one emotional or behavioral disorder was 10.7%, O.R. 3.73, 95% CI: 2.43–4.69, whereas at age 7 this had risen to 25.2%, O.R. 4.94, CI: 3.46–7.05. There was some stability in use of services from T1 to T2: 34.4% of service users at T1 were also users at T2, O.R. 6.31, CI: 3.97–10.02. Table 1 shows that at age 4 the primary service providers were health nurses and community agencies. At age 7, family physicians, CAMHS, hospitals and school counselors provided services as well.

Predictors

The presence of emotional, O.R. 2.54, CI: 1.66–3.63, and behavioral, O.R. 5.64, CI: 3.35–9.49, disorders at T1 predicted service use at T2. Table 2 indicates, however, that when previous service use and co-morbidity of emotional and behavioral disorders are taken into consideration (Step 1), only behavioral disorders, not emotional disorders, predict service use. Results of Step 2 show that incapacity is, not surprisingly, highly predictive, eliminating the previously significant direct effect of behavioral disorders. Additional General Linear Model analyses employed to investigate relations between disorders and incapacity revealed that both behavioral (B=.99, CI: .71-1.27, $p<.001$) and emotional disorders (B=.60, CI: .38-.82, $p<.001$) predicted incapacity when adjusted for service use.

Entering demographics (Step 3) revealed that low parental SES more than doubled the odds of service use and that boys were more likely to be referred, even when the presence of disorders and incapacity were taken into account. Given the same degree of disturbance, then, boys had a greater probability than girls of receiving services. As regards parental factors (Step 4), neither parents' own history of help-seeking nor their social support network affected the probability of the child receiving professional help. Finally, in Step 5 the perception of the child being in need of help by both parents and, separately, day-care teachers, added to the prediction of service use. These contributions to prediction did not affect the earlier-detected effects of (low) SES.

Discussion

Analyzing data from a large community sample of 4-year olds living in Trondheim and followed up in 1st grade revealed that behavioral disorders, but not emotional disorders, predicted service use. When incapacity from disorders was considered, incapacity proved predictive at the expense of symptom- and onset/duration-based diagnoses, such that greater incapacity, but not diagnosis, forecasted more service use. Moreover, when burden to parents and problem recognition by parents and day-care teachers were considered, these factors proved predictive; indeed, inclusion of these factors eliminated the earlier-detected direct effect of incapacity. In addition, low parental SES and previous service use predicted more future service use. In sum, the current results indicate a help-seeking process originating with behavioral symptoms in the child. If such symptoms lead to child impairment, the likelihood of service use increases, but only if the impairment increases the burden placed on parents or makes parents or day-care teachers regard the problems as mental-health problems, thus perceiving the child to be in need of professional help.

Only one in every 10th preschooler with emotional or behavioral disorders had received help for such problems, but upon school entry this had risen to every fourth child. Although the rate of service use among preschoolers with disorders was low, it was higher than among U.S. preschoolers,⁵ possibly reflecting differences in availability and costs of services, with Norwegian children having comparatively free and easily accessible health service. The sharp increase in service use from preschool to school entry is in accordance with official statistics¹⁶ and the comparably higher rates reported for older children elsewhere.²² Conceivably, symptoms have endured for a longer time and hopes for spontaneous remission may thus wane by the time the child has started school. The school setting may also put greater demands on the child, making incapacities and resulting burden to parents stronger or more evident than in the day-care setting, thereby resulting in awareness among teachers and parents that the child is in need of help.

Child needs. Previous studies have reported conflicting results regarding the relative importance of behavioral and emotional problems for service use.^{10, 23} Although greater emotional disorders predicted more

service use in the present study, this association was attributable to the former's comorbidity with behavioral disorders. Given the apparent importance of teachers' perception for children's service use, the lack of referrals due to emotional disorders should be seen in the context of a probable tendency towards non-identification of emotional problems among Norwegian day-care^{15, 24} and school²⁵ teachers. This finding is corroborated by UK research showing that teachers are less concerned when a child presents with emotional problems as compared to behavioral problems.²⁶ Behavioral disorders may cause more child impairment and burden to caregivers than emotional disorders,⁹ but it is also possible that parents and teachers simply perceive symptoms of anxiety and depression as less problematic or pathological, and/or have higher hopes for spontaneous remission in the case of such problems.

Sociodemographic factors. Low parental SES was a strong predictor of service use, beyond the effect of higher prevalence of disorders in children of parents with low SES.² These results contrast markedly with those pertaining to older children which generally find no effect of SES when child needs are taken into account,²⁷ but also contrasts with one study of U.S. adolescents that found higher SES to predict increased service use when severity of problems were taken into account.²⁸ The possibility of different mechanisms at different ages notwithstanding, differences between U.S. and Norwegian findings may be explained, at least in part, by national differences in the costs of services to families. In any event, the lack of costs involved in Norway does not explain why low-SES children more often were service users. Note that a range of alleged explanatory variables such as less social support, greater resulting incapacity from disorders, increased burden and higher problem recognition did not account for the detected social-status difference. The mechanisms mediating this differential effect of lower vs. higher SES on service use should therefore be examined more closely in future research.

Burden and problem recognition. Although burden to parents and problem recognition by parents predicted service use, which accords well with previous research on older children,^{9, 29} the most striking new finding involved the apparent influence of problem recognition by day-care teachers. The children of the TESS study had spent on average 5,538 hours in day-care at first assessment,³⁰ and their teachers therefore had ample opportunity to observe them and compare their behavior with that of many other children. These teachers should therefore be well positioned to evaluate the extent to which problems are within the normal range and potential resulting impairments. Their concerns, to the extent that they are shared with parents, may thus carry particular weight in instigating a help-seeking process, especially for behavior problems. Day-care and primary-school teachers may, however, be less sensitive to or concerned about emotional problems.

Limitations. Several limitations should be acknowledged when interpreting the present results. First, despite the prospective design of the research, the temporal ordering of predictors and outcome is by no means

unequivocal. For example, it cannot be ruled out that parental burden or needs recognition may affect factors portrayed as originating earlier in the help-seeking process, such as social support or incapacity. Second, diagnoses were set according to interview with only one of the parents, and the identified needs of the child could therefore have been different had the other parent's perspective and that of other day-care teachers been taken into account. Third, although a wide range of factors were examined, our selection of predictors was by no means all-encompassing, and information concerning other potentially important factors such as attitudes and previous experiences with services may have, if included, increased predictive power. Finally, any and all professional service use was combined which may have obscured differential predictors of different types of services.³¹

Conclusion

Even though services for children's mental-health problems are available and free in Norway, only 10% of 4-year olds with emotional or behavioral disorders received professional help, a figure that rose to 25% by first grade. Efforts to increase detection and referrals are therefore warranted, possibly involving screening at the community level. The pathway towards service use among young children may originate with symptoms of mental-health disorders, but only if they are of behavioral and/or disruptive in nature. Our findings indicate that such behavioral symptoms only increase the probability of service use if impairment in the child results, if this impairment represents a burden to parents, and if the problems are recognized and the child is seen as in need of help by parent, and, in particular, by day-care teachers. Continuing education concerning the nosology, presentation and consequences of emotional disorders among day-care teachers may therefore increase referrals of young children in need of help for mental-health problems.

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Table 1

Frequency of service use for psychiatric diagnoses at age 4 and age 7 (first grade). Percentage and 95% CI

Type of service used	Age 4		Age 7	
	Percentage	95% CI	Percentage	95% CI
Any service	4.2	3.6-5.0	8.7	7.5-10.1
Family Physician	.7	.4-1.1	2.2	1.6-2.9
Health Nurse	1.5	1.1-1.9	1.8	1.4-2.4
Community Services	1.4	1.1-1.8	2.2	1.7- .9
School Counseling	.7	.5-1.0	1.9	1.3-2.6
Social Services	0	NA	.1	0-.1
Child Protection Services	.2	.1- .4	.1	.0 - .1
Psychologist: private practitioner	.1	.0-.1	.2	.0-.8
Psychiatrist: private practitioner	0		0	
Child and Adolescent Psychiatric	.2	.1 - .4	1.2	.9-1.8
Outpatient Clinic				
Homeopath	0		.2	.1-.3
Other alternative medicine	.2	.1-.5	.3	.1-.8
Hospital	.7	.4-1.2	2.9	2.2-3.9
Other	.6	.3-.9	.9	.6-1.4

Table 2

Predictors at age 4 of service use for psychiatric diagnoses at age 7 (first grade).

Predictors at T1 (scale range)	Mean(S.E.)/percentage	Step 1			Step 2			Step 3			Step 4			Step 5		
		OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Previous service use	4.2%	5.85	3.21-10.68	<.001	4.47	2.43-8.22	<.001	5.41	2.73-10.71	<.001	6.47	3.14-13.35	<.001	4.98	1.77-14.06	.002
Behavioral disorder	4.9%	2.64	1.32-5.30	.006	2.00	.95-4.22	.07	2.06	.91-4.68	.08	2.28	.94-5.48	.07	1.52	.79-3.24	.19
Emotional disorder	9.7%	1.72	.97-3.04	.06	1.40	.75-2.63	.29	1.34	.70-2.59	.31	1.16	.58-2.31	.70	1.56	.70-3.49	.28
Number of incapacities (0-19)	.24 (.02)				1.33	1.15-1.55	<.001	1.29	1.10-1.51	.002	1.23	1.01-1.50	.04	.98	.77-1.26	.89
Gender (boy)	49.4%							1.70	1.06-2.71	.03	1.68	1.04-2.73	.04	1.56	.82-2.97	.18
Parents not living together	11.3%							1.77	.90-3.46	.10	1.97	.92-4.24	.08	1.65	.57-4.82	.36
Low parental SES	27.5%							2.33	1.45-3.75	<.001	2.47	1.51-4.04	<.001	3.04	1.53-6.07	.002
Parental social support (1-7)	4.33 (.02)										.75	.54-1.06	.10	.92	.65-1.31	.55
Parents received treatment	21.3%										1.41	.77-2.61	.27	1.38	.64-2.98	.41
Burden to parents	2.03 (.02)													1.07	1.01-1.14	.02
Parents: child needs help	5.5%													2.67	1.00-7.82	.05
Health nurse: child needs help	1.17 (.02)													1.13	.89-1.44	.32
Day care teachers: child needs help (0-6)	.37 (.02)													2.12	1.39-3.23	<.001