Maternal psychological distress and offspring psychological adjustment in emerging adulthood: Findings from over 18 years.

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Abstract

Objective: To examine the long-term prediction of psychological maladaptive (i.e., symptoms of anxiety and depression) and adaptive adjustment (i.e., self-efficacy) in emerging adult offspring from trajectories of maternal psychological distress from toddlerhood to adolescence.

Method: Trajectories of maternal psychological distress (low, moderate, high and low-rising patterns) from toddlerhood (age 1.5) to adolescence (age 14.5) was used to predict psychological adjustment in emerging adult offspring (age 18-20) (n=400).

Results: Adverse maternal distress trajectories during childhood were linked to maladaptive and adaptive adjustment in adult offspring. Consistently high maternal distress levels experienced across childhood predicted higher symptoms of anxiety and depression and lower self-efficacy, compared to low maternal distress trajectories. Two other adverse maternal distress trajectories (consistently moderate and low-rising patterns), compared to the low trajectory, predicted higher offspring depressive symptoms. The findings persisted when adjusting for potential confounders: Offspring gender and maternal education, relationship status, language and economy.

Conclusion: The current study showed longitudinal multi-informant impact from adverse maternal distress trajectories to adult offspring maladjustment over 18 years, emphasizing the importance of early identification and prevention.

Keywords: mothers; mental health; intergenerational; emerging adulthood; self-efficacy; depression; anxiety

INTRODUCTION

Parental psychological distress has the potential to affect the offspring adversely across the child-rearing phase (i.e., infancy to adolescence) and into emerging adulthood [1-4]. Thus, it is valuable to examine trajectories (i.e., developmental patterns) of parental distress across the child-rearing phase – which includes several transitional periods affecting both the parent and the child in different ways. A person-centred approach, in which differences in distress trajectories are highlighted, is especially appropriate when developmental trajectories are assumed to systematically differ across individuals [5]. Moreover, identifying which maternal distress trajectories are particularly risky for offspring adjustment, such as mental health and self-efficacy could make it possible to prevent or reduce the continuity and intergenerational transmission of mental health problems.

The intergenerational transmission of psychological distress is suggested to work through biological and environmental influences, or a combination of these [1-3,6,7]. Some periods might be particularly sensitive for experiencing parental psychological distress. Early childhood maternal depression is linked to increased child problem behavior [2,8-10], with suggested causes being non-optimal mother-child interactions [3,4]. Middle childhood is suggested as another sensitive period because of stage-salient expectations of academic, social and cognitive abilities[11,12]. By using person-oriented methods, we can investigate how different trajectories of maternal psychological distress across the entire child-rearing period impact long-term adjustment.

Of the few earlier studies that have examined the link between maternal psychological distress trajectories and psychological adjustment in older offspring, the findings vary both in types of identified trajectories, and in the outcomes. Adverse maternal distress trajectories have predicted psychiatric disorder and depressive symptoms at ages 9-17[13], internalizing and

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externalizing problems at age 15[14], and suicidal ideation at age 16[15]in some studies. Other studies have reported no associations between adverse maternal distress trajectories and offspring internalizing problems at ages 11-13[16] and age 16[17]. The only study examining late adolescence, reported that adverse maternal depressive trajectories from 10 to 15 predicted anger regulation, self-concept and depressive symptoms at ages 16-19[18]. Still, none of these studies capture maternal distress patterns across the entire child-rearing period and few studies examine both adaptive characteristics, such as self-efficacy, in addition to maladaptive adjustment. Self-efficacy is a persons' belief about their capability to achieve what they desire, and is related to well-being, mental and somatic health[19-21]. An increased understanding of adaptive and modifiable factors such as self-efficacy is important for health promotion and intervention efforts.

The focus on emerging adulthood adjustment is important due to several factors. First, this stage is characterized by several milestones including getting an education and establishing a career, long-lasting relationships and a family[22]. Having good psychological adjustment at this time is important for reaching such milestones. Second, internalizing problems and depression increases steadily after early adolescence up to late adolescence, making emerging adulthood a suitable time to examine psychological adjustment without interference of the turmoil of adolescence. In addition, with increasing age, social support and self-efficacy is increasingly drawn from non-familial context such as educational institutions, work places and other social arenas. The potential adverse effect of maternal psychological distress experienced in childhood could therefore have "washed off" by emerging adulthood. The current study use previously identified latent profiles of maternal distress (e.g., symptoms of anxiety and depression) across six waves from toddlerhood to early adolescence (age 1.5 to 14.5) (blinded references) to predict self-reported psychological adjustment (e.g., symptoms

of anxiety and depression, and self-efficacy) in male and female offspring in emerging

adulthood (age 18-20).

METHODS

Sample and procedure

The current study used data from BLINDED STUDY, a community-based prospective

longitudinal study (blinded reference). The data collection is approved by The Data

Inspectorate and the Regional Committee for Medical Research Ethics, and is subject to the

ethical guidelines and rules of confidentiality. All families from 19 geographic health care

areas in Norway were invited to complete a survey questionnaire when attending the 18-

months vaccination visit for the offspring in 1993 (t1: age 1.5). Routinely, more than 95% of

all Norwegian families with children attend a public health program during the first four years

of the child's life. Of 1081 eligible families visiting the 19 child health clinics, 913 mothers

participated at baseline (t1). Families participating at t1 received a similar questionnaire when

the children were age 2.5 (t2), 4.5 (t3), 8.5 (t4), 12.5 (t5), 14.5 (t6), 16.5 (t7) and 18-20 (t8).

Mothers completed questionnaires at all waves, and the offspring completed questionnaires

from wave t5 onward. We distributed questionnaires at the health clinics at t1-t3 and by post

from t4.

[Table 1 in here]

Table 1 shows descriptive data of the participating families. At baseline, the majority

of the mothers was in a relationship, had more than nine years of education and reported

Norwegian as their mother tongue. Background data from the child health clinics showed that

non-respondent mothers at t1 did not differ significantly from responding mothers with regard

to maternal age, education, employment status, or marital status (blinded reference). The

sample for the current study included mothers responding from t1 to t6 (t1: n = 913; t2: = 777;

t3:= 727; t4: n = 505; t5: n = 587; t6: 472). Offspring's' responses at ages 19-20 (t8) (n = 400; 58% girls) was used in the current study.

Attrition

Attrition analyses of several factors (e.g., mother's temperament and psychological distress, offspring's temperament, and mothers' emotional support from partner and friends) indicated that only low maternal educational level predicted maternal drop-out from t1 to t5 (blinded reference) and t1 to t7 (blinded reference). Similarly, low maternal education level and male gender predicted offspring dropout from t1 to t7 (blinded reference) and t8 (blinded reference). Associations between baseline variables did not differ among dropout versus remaining families, suggesting estimated associations between variables are generalizable (blinded reference).

Measures

Trajectories of maternal psychological distress. We assessed psychological distress in mothers with the Hopkins Symptom Check List (SCL)[23,24]; at all waves (t1 to t8). Originally consisting of 25 item, the SCL measures symptoms of anxiety and depression on a 4-point scale (from 1 "Not at all" to 4 "Very much"). One item: "Thoughts of killing yourself", was removed at t1-t2, and another item: "Loss of sexual interest or pleasure", was removed at all waves as they were rated as offensive in our pilot-study (blinded reference). The SCL is a validated instrument with high psychometric qualities[23,24, 25]. Cronbach alpha in the current sample varied from .87 to .91 (t1-t6).

Former research using the same data identified six latent trajectories based on mean scores of the SCL from 1993 (t1) to 2008 (t6) using latent profile analysis (LPA), which is a person-centered approach grouping the sample into a set of latent subpopulations with similar developmental trajectories (Blinded reference). Posterior class membership probabilities were

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estimated after model estimation for the assignment of individuals to pseudo-classes according to the maximum probability rule (blinded reference). The 913 women were grouped into four trajectory groups: 1) 'Low' group with no, low or moderate-to-low levels of distress (54%); 2) a 'Moderate' group with consistent moderate symptom scores at all waves (32%); 3) a 'High' group with overall high symptom levels (10%); and 4) a 'Low-Rising' group with initially low symptom levels that start increasing from t4 (age 8.5) to a level similar to the High group by t6 (age 12.5) (4%) (See blinded reference for further details). Figure 1 shows the mean and standard deviation for the SCL-scores of the resulting four distress trajectory groups at each time point. The sample consisted of 400 emerging adults participating at T8 with the following distribution in the maternal distress groups: Low (55%; n=221), Moderate (31%; n=123), High (10%; n=40) and Low-rising (4%; n=16) group.

[Figure 1 in here]

Offspring mental health. The Short Mood and Feelings Questionnaire [26] were used to measure depressive symptoms at t8. The SMFQ measures affective and cognitive symptoms of depression with 13 items (e.g., "didn't enjoy anything at all" and "felt miserable or unhappy") on a three-point scale (0:'True", 1:"Sometimes true" and 2:"Not True"). A mean score was computed. Cronbach alpha was .88. The Anxiety Scale from the Depression, Anxiety and Stress Scale (DASS) [27] was utilized to measure symptoms of general anxiety at t8. The Anxiety Scale measures autonomic arousal, skeletal muscular effects, situational anxiety, and subjective experiences of anxiousness with 14 items on a four-point scale ranging from 0 ("did not apply at all") to 3 ("applied very much, or most of the time"). A mean score was calculated. Cronbach alpha in the current sample was .90. Both SMFQ[26,28] and DASS[27,29] are well-used instruments with high psychometric quality.

Offspring self-efficacy. Generalized self-efficacy[20] measures self-efficacy with five items (e.g., "I can always manage to solve problems if I try hard enough") on a four-point scale ("Not at all true" to "Exactly true"). A mean score was calculated. The scale is well-used in different countries and settings, and have shown good psychometric validity and reliability[20,30]. Cronbach alpha in the current sample was .79.

Confounders. We examined correlations between the main variables (offspring mental health and self-efficacy, and maternal psychological distress) and potential confounders: maternal age, years of education; maternal work participation; maternal relationship status; language; economy, number of children in the household), and offspring gender. Offspring female gender was associated with significantly higher symptoms of anxiety and depression (r = .23/.25; p = .000) and lower self-efficacy (r = -14; p = .004). Low maternal education (r = .18; p = .000), single relationship status (r = .10; p = .025), other mother tongue than Norwegian (r = 09; p = .037) and low family economy (r = .17; p = .000) were associated with more adverse psychological distress group. We adjusted the analyses for these five variables.

Statistical analyses

We used one-way between-subjects analyses of variance with SPSS version 17 to assess differences in emerging adulthood psychosocial adjustment between the four trajectory groups of maternal psychological distress between t1-t6 (Low, Moderate, High and Low-Rising distress groups). Multivariate analyses examined offspring mental health (i.e., symptoms of anxiety and depression), and univariate analyses examined offspring self-efficacy. First, we conducted unadjusted analyses. Second, maternal education, relationship status, language, family economy and offspring gender was adjusted for. Interaction analyses

were conducted to examine the effect of maternal distress trajectories on male versus female offspring.

<div align="center">RESULTS</div>

Table 2 shows the correlations between maternal psychological distress during childhood and psychological adjustment in emerging adulthood. The majority of the associations between maternal psychological distress at age 1.5 to 14.5 (t1-t6), and psychological adjustment in emerging adulthood (t8) were significant.

<div align="center">[Table 2 in here]</div>

Multivariate analyses of variance (MANOVA) were conducted to examine the relationship between maternal distress trajectories and psychological adjustment in adult offspring. There was a statistically significant difference between the four trajectories of maternal distress (Low, Moderate, High and Low-rising distress) on the combined dependent variable of offspring mental health: F (6,790) = 5.30, p=.000, Wilks' Lambda=0.92, partial η^2 = .04. There were significant maternal distress group differences for offspring symptoms of depression: F (3,396) = 8.66, p=.000, partial η^2 = .06 and anxiety F (3,396) = 4.51, p=.004, partial η^2 = .03. Bonferroni post-hoc test show significant higher anxiety and depressive symptoms for offspring with mothers in the High distress versus the Low distress group (p=.006). The mothers in the moderate distress group had offspring reporting higher depressive symptoms than the Low distress group (p=.000). There were no significant group differences between the Moderate and High group, and the Low-rising distress group was not significantly different from the other groups. See mean scores and confidence intervals in table 3.

Univariate analysis of variance showed significant maternal distress group differences for self-efficacy: F (3, 396) = 3.81, p=.010, partial η^2 = .03. Bonferroni post-hoc test showed significant lower self-efficacy for offspring with mothers in the High distress group versus the Low distress group. There were no significant differences with or between the other groups.

All analyses remained significant and similar for most offspring outcomes when adjusting stepwise for 1) offspring gender and 2) offspring gender, maternal education, relationship status, language and family economy. However, there were no significant differences between maternal trajectory groups for offspring anxiety, when adjusting for all confounders concurrently. See model 3, table 3. There were no significant gender interactions for any outcome (p>.05).

[Table 3 in here]

DISCUSSION

We aimed to explore to what extent trajectories of maternal psychological distress during 13 years of childrearing (from age 1.5 to 14.5) predicted offspring psychological adjustment in emerging adulthood (ages 18-20). There are three main findings**: First**, findings indicate that exposure to consistently high maternal psychological distress across the entire childhood period is associated with both higher maladaptive (i.e., offspring symptoms of anxiety and depression) and lower adaptive (i.e., offspring self-efficacy) adjustment. **Second**, exposure to consistent moderate distress across childhood or high maternal distress levels during some parts in childhood (i.e., low-rising trajectory group) also represented a risk for higher levels of offspring depressive symptoms in emerging adulthood. **Third,** the findings indicated no gender-specific vulnerability for experiencing maternal psychological distress.

These findings underscore the intergenerational transmission of psychological distress – from adverse maternal distress levels across childhood to both offspring anxiety and depressive symptoms over a period of 18 years - and expand on former findings reporting similar links over shorter periods of follow-up [13,27-29]. Moreover, we also expand the findings to including links between maternal distress and adaptive psychological adjustment: Self-efficacy was significantly lower in adult offspring with mothers having consistent high distress levels. Thus, self-efficacy, which is a modifiable trait, might be an area to focus interventional efforts when targeting families with parental psychopathology.

Our findings underscore the examination of psychological distress patterns across time. Offspring experiencing maternal psychological distress from middle childhood (age 8.5) and onwards, reported higher depressive symptoms than offspring of mothers with low distress, supporting the view of middle childhood as a vulnerable period [11]. However, there were no significant differences between the three adverse distress trajectories. The small number in some of the trajectory groups might be a potential reason for this: Two of the adverse distress groups were of small sizes with 10% adolescents experiencing consistently high maternal distress, and 4% experiencing low-rising maternal distress. These numbers represent a threat to the statistical power of the study, but are in line with low number of adverse maternal distress trajectories in former studies [31,32]. Still, future studies should include larger samples with more variance in distress levels to examine nuanced group differences with higher statistical power.

Despite the multi-wave and multi-informant associations reported in the current study, maternal psychological distress only accounted for a modest portion of variance (i.e., 2-6%) in emerging adult offspring adjustment, representing a non-deterministic perspective of childhood adversities. Further, the trajectories span across such a long time and many different individual and contextual factors may come into play during this period.

Additionally, as mentioned in the introduction, the emerging adulthood stage is characterized by new transitions and milestones, with increasing influences from other contexts than the family (e.g. teachers, co-workers/co-students, romantic partners and peers) [22]. The current findings show that adverse maternal trajectories is similarly detrimental for girls versus boys, and that background characteristics such as maternal education, relationship status, language and family economy did not reduce the significance of the long-term intergenerational link between maternal distress and offspring adjustment. The examination of other risk factors throughout development is needed to see for whom early adverse risk factors are most detrimental.

Strengths and limitations

Although the study has strengths in its multi-wave and multi-informant approach and psychometrically sound measures, there are some limitations. First, the use of self-report increase the risk for shared method variance to inflate the strength of associations. However, the use of multiple waves and informants reduces the common method bias. Second, although former attrition analyses indicate that only low maternal education and male gender are associated with non-participation, it is important to note that the sample is representative of a "normal" population, and not to the same extent representative of a high-risk population. Significant findings may be stronger in a high-risk sample with larger variance in psychological distress.

Despite one of the strengths of this study being the use of a person-centered approach to derive trajectory groups throughout the child-rearing period, the groups for the current paper are based on pseudo classes, not taking into consideration the uncertainty of the class memberships, instead of modelling outcomes within a complex LPA-model. Because the average posterior class probabilities for trajectory membership for our six-group solution ranged from .80 to .91, the ambiguities regarding the class memberships are not large and the

effect of not including the uncertainty of latent class membership in the analyses is not likely to produce substantial bias to the current results (blinded reference).

CONCLUSION

The study expands upon previous studies by using a longer time span, multi-informant method following mother-child dyads across 18 years. The impact of maternal-reported distress on offspring-reported adjustment underscores early prevention within an integrative family perspective. However, the effects were only moderate, suggesting a non-deterministic indication that early maternal distress may not affect long-term maladjustment for all.

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Table

Table 1: Characteristics of participating mothers and their child at baseline (T1)

Maternal age (years), mean (SD)	30 (4.7)
Maternal education (%)	
Basic schooling (≤9 years)	9.5 %
Basic schooling+ (10-11 years)	27.6 %
Finished high school (12 years)	25.4 %
Higher education (≥13 years)	37.6 %
Maternal work status (%)	
No paid work	37.0 %
Part-time paid work	32.0 %
Full-time paid work	31.0 %
Maternal relationship status (%)	
Married/cohabiter	91.2 %
Single	8.8 %
Maternal mother tongue (%)	
Norwegian	93.6 %
Other than Norwegian	6.4 %
Family economy	
We manage well/very well	53.4 %
We manage	40.7 %
We manage poorly/very poorly	5.9 %
Pariety (%)	
1 child	48.2 %
2 children	37.2 %
3-10 children	14.6 %
Offspring infant gender (%)	
Girl	51.1 %
Boy	48.9 %

Table 2: Descriptive details and correlations between maternal psychological distress during childhood (age 1.5-14.5) and offspring psychological adjustment (age 18-20)

	M	(SD)	Adolescent adjustment at age 18-20					
			Depressive symptoms		Anxiety symptoms		Self-efficacy	
Maternal psychological distress								
Age 1.5 (T1)	1.33	0.32	0.19	**	0.18	**	-0.15	**
Age 2.5 (T2)	1.29	0.27	0.13	*	0.14	*	-0.08	
Age 4.5 (T3)	1.28	0.28	0.18	**	0.18	**	-0.14	*
Age 8.5 (T4)	1.29	0.31	0.2	**	0.16	**	-0.15	**
Age 12.5 (T5)	1.4	0.41	0.18	**	0.15	**	-0.19	**
Age 14.5 (T6)	1.35	0.32	0.18	**	0.13	*	-0.14	*
Age 19 (T8)	1.36	0.33	0.19	**	0.16	**	-0.13	**
Adolescent adjustment at age 18-20								
Depressive symptoms (T8)	0.47	0.41						
Anxiety symptoms (T8)	1.3	0.42						
Self-efficacy (T8)	2.11	0.59						

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Correlations for offspring n=294-385

Table 3: Mean scores and confidence intervals for offspring psychological adjustment (age 18-20) for different maternal psychological distress trajectory groups during childhood (age 1.5-14.5)

Distress groups	Model 1			Model 2			Model 3		
	Mean		CI 95%	Mean		CI 95%	Mean		CI 95%
Depressive symptoms									
Consistent low	0.38		(0.32- 0.43)	0.38		(0.32- 0.43)	0.37		(0.31- 0.42)
Consistent moderate	0.56	***	(0.49- 0.63)	0.57	***	(0.50- 0.64)	0.56	*	(0.49- 0.63)
Consistent high	0.60	**	(0.48- 0.73)	0.59	**	(0.47- 0.71)	0.58	*	(0.45- 0.70)
Low-to-high	0.64	*	(0.44- 0.83)	0.64	*	(0.45- 0.83)	0.65	*	(0.45- 0.85)
Anxiety symptoms									
Consistent low	1.24		(1.18- 1.29)	1.24		(1.18- 1.29)	1.24		(1.18- 1.29)
Consistent moderate	1.34		(1.27- 1.41)	1.35		(1.28- 1.42)	1.34		(1.27- 1.41)
Consistent high	1.47	**	(1.34- 1.59)	1.46	**	(1.33- 1.58)	1.42		(1.29- 1.55)
Low-to-high	1.26		(1.07- 1.46)	1.27		(1.07- 1.46)	1.26		(1.06- 1.46)
Self-efficacy									
Consistent low	2.19		(2.11- 2.26)	2.19		(2.11- 2.26)	2.21		(2.13- 2.29)
Consistent moderate	2.04		(1.94- 2.15)	2.04		(1.93- 2.14)	2.04		(1.93- 2.14)
Consistent high	1.89	*	(1.70- 2.07)	1.90	*	(1.71- 2.08)	1.92	*	(1.72- 2.11)
Low-to-high	2.15		(1.86- 2.44)	2.15		(1.86- 2.43)	2.09		(1.79- 2.39)

Model 1: Unadjusted

Model 2: Adjusted for adolescent gender

Model 3: Adjusted for adolescent gender, maternal education, relationship status, language and family economy

* Significantly different from consistent low group p>.05

** Significantly different from consistent low group p>.01

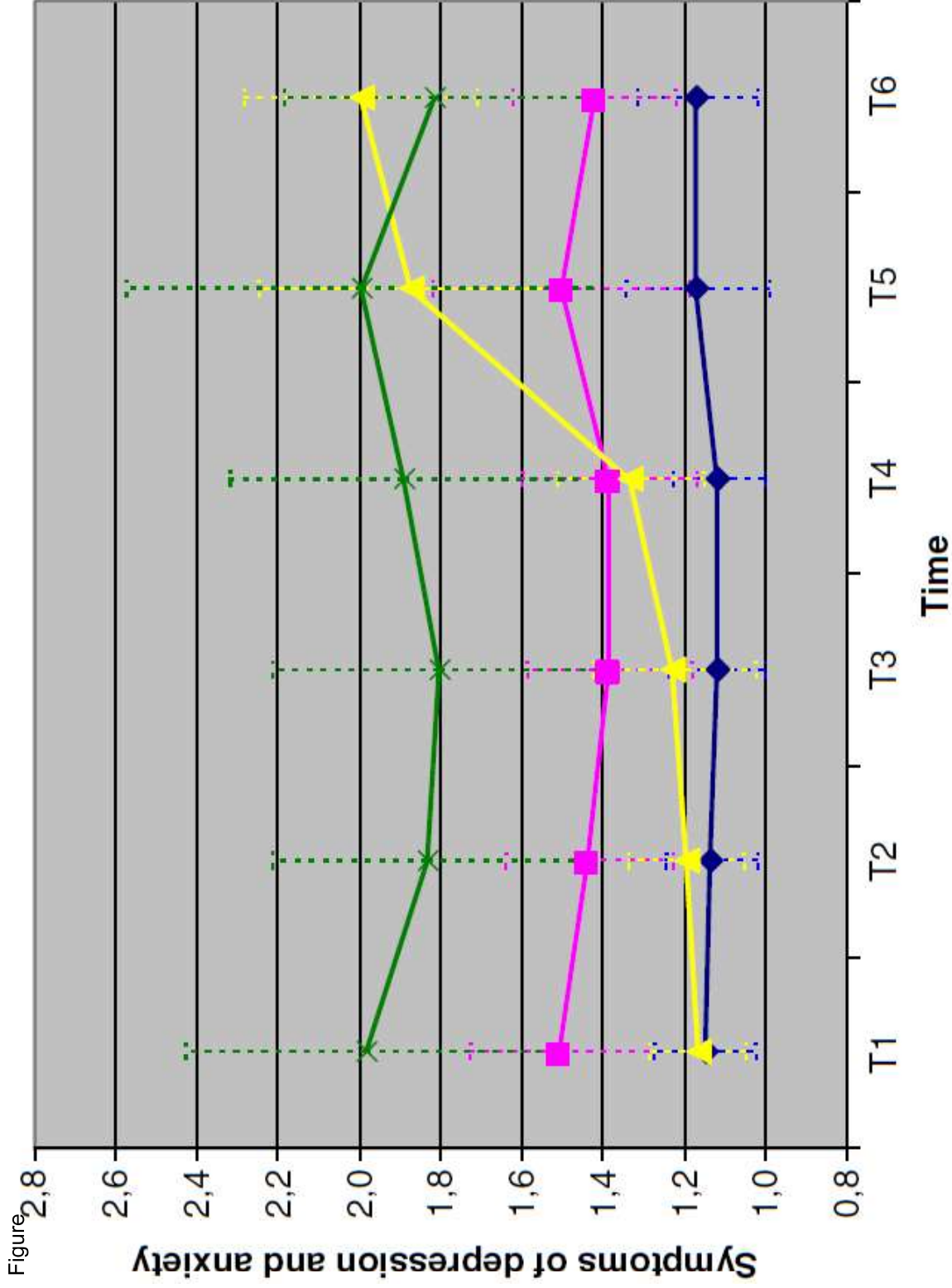*** Significantly different from consistent low group p>.001

Figure 1 Mean symptom scores and standard deviations (SCL) in the four trajectory groups on each of the six waves of data collection. Used with permission from (blinded reference)