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Mental health, risk and protective factors at micro- and macro-levels across early at-risk stages for psychosis: The Mirorr study

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Abstract

Background: The clinical staging model states that psychosis develops through subsequent stages of illness severity. To better understand what drives illness progression, more extensive comparison across clinical stages is needed. The current paper presents an in-depth characterization of individuals with different levels of risk for psychosis (i.e., different early clinical stages), using a multimethod approach of cross-sectional assessments and daily diary reports.

Methods: Data came from the Mirorr study that includes $N = 96$ individuals, divided across four subgroups ($n_1 = 25$, $n_2 = 27$, $n_3 = 24$, and $n_4 = 20$). These subgroups, each with an increasing risk for psychosis, represent clinical stages 0-1b. Cross-sectional data and 90-day daily diary data on psychopathology, well-being, psychosocial functioning, risk and protective factors were statistically compared across subgroups (stages) and descriptively compared across domains and assessment methods.

Results: Psychopathology increased across subgroups, although not always linearly and nuanced differences were seen between assessment methods. Well-being and functioning differed mostly between subgroup 1 and the other subgroups, suggesting differences between non-clinical and clinical populations. Risk and protective factors differed mostly between the two highest and lowest subgroups, especially regarding need of social support and coping, suggesting differences between those with and without substantial psychotic experiences. Subgroup 4 (stage 1b) reported especially high levels of daily positive and negative psychotic experiences.

Conclusions: Risk for psychosis exists in larger contexts of mental health and factors of risk and protection that differ across stages and assessment methods. Taking a broad, multi-method approach is an important next step to understand the complex development of youth mental health problems.

KEYWORDS
clinical staging, diary study, psychopathology, psychosis, ultra high risk (UHR)

1 | INTRODUCTION

Youth mental health represents an urgent global challenge (Mei et al., 2020). Mental illness often emerges early (Kessler et al., 2005, 2007; Paus et al., 2008) and has a life-time course (Caspi et al., 2020; Kessler et al., 2011). Mental disorders form the leading cause of disability in young people (Gore et al., 2011) and greatly impact normal development (Patel et al., 2007). Early intervention, mostly developed in the context of psychosis, has proven fruitful (Fusar-Poli et al., 2013; McGorry & Mei, 2018).

Central to early detection is the clinical staging model (Fava & Kellner, 1993; McGorry et al., 2006) that theorizes that mental disorders develop through subsequent clinical stages. Symptoms are milder, more transient and non-specific in earlier stages and more chronic, severe and diagnosis-specific in later stages (McGorry & van Os, 2013). Earlier stages index risk for developing more severe illness, but progression is not inevitable. Empirical studies have investigated links between stages and, among others, brain development (Wood et al., 2011), cognition (Bora et al., 2014; Romanowska et al., 2018), biomarkers (McGorry et al., 2014), as well as clinical implementations (Addington et al., 2019; Hickie et al., 2013; McGorry & Hickie, 2019). Ongoing discussions revolve around the potentially transdiagnostic and dynamic expression of psychopathology (McGorry & Nelson, 2019; Nelson et al., 2017) and between-individual heterogeneity (Nelson et al., 2017).

Previous research on the development of psychosis has focused mostly on psychotic pathology and risk factors for psychosis (Yung et al., 2012). However, a broader perspective may deepen our understanding of the different stages and transitions between them. Although characterization of early stages of psychotic expression relies heavily on positive psychotic symptoms (e.g., hearing voices) (Wigman et al., 2020), other symptoms (e.g., anxiety and depression) are also common (Lin et al., 2015; Yung et al., 2007). Therefore, a transdiagnostic approach spanning multiple psychopathological domains seems warranted (McGorry et al., 2018). Since early intervention has its roots in psychiatry, the focus lies on psychopathology and risk factors. However, other domains, such as psychosocial functioning (Lin et al., 2013), well-being and protective factors (Jeste et al., 2015) are also crucial in the development of mental health problems and should also be taken into account.

In addition to broadening the *content*, broadening the *type* of measurements is also needed, as the development of psychopathology plays out at multiple time frames (Wichers, 2014). Combining multiple assessment methods tapping into different time scales provides a more comprehensive understanding of processes at work. Cross-sectionally assessed variables give global impressions of current feelings, thoughts and functions; assessments spanning multiple months/years provide insights in long-term processes; daily assessments provide more detailed insights in daily life mechanisms that contribute to healthy or pathological developments (e.g., being able to enjoy today's social company). Thus, different assessment methods offer different, complementary insights (Bystritsky et al., 2012; Eronen, 2019). Finally, as psychopathological development differs strongly between individuals (Nelson et al., 2017), it is important to investigate which aspects of this process are universal or individual-specific (Fisher et al., 2018).

To accommodate such a broader approach, we designed the *Mapping Individual Routes Of Risk and Resilience* (Mirorr) study (Booij et al., 2018). This study follows four subgroups of young adults with different levels of risk for psychosis (representing different early clinical stages) for 3 years and combines cross-sectional and daily diary assessment methods. The aim of this paper is to examine how psychopathology, well-being, functioning and factors of risk and protection are expressed across different early clinical stages, using cross-sectional questionnaires and in-depth daily diary assessments. The approach we have taken in this paper was a descriptive one, aiming to broadly characterize our subgroups at basel.

2 | METHODS

2.1 | Design

Participants are assessed at baseline and after 1, 2, and 3 years (Booij et al., 2018). Each assessment, questionnaires and interviews are completed on psychopathology, well-being, functioning and risk and protective factors. At baseline and first follow-up, a 90-day diary study was completed with one assessment every evening. The current study concerns cross-sectional and diary data at baseline (T0). The study has been approved by the medical ethical committee of the University Medical Centre Groningen, Groningen, The Netherlands (registration number MEC no. 2015/159, ABR no. NL52974.042.15). The study has been conducted in accordance with the Helsinki Declaration. All participants provided written informed consent.

2.2 | Participants

Mirorr consists of 96 young adults, divided across four subgroups. Subsequent subgroups represent different levels of risk for psychosis (i.e., different clinical stages; Figure 1). Inclusion criteria were: (1) age 18–35 years; (2) read and speak Dutch fluently; (3) capability to follow procedures; (4) providing Informed Consent. Exclusion criteria were: (1) history of/current psychotic episode; (2) significant hearing/visual impairments; (3) pregnancy.

For subgroup 1, we recruited $N = 100$ individuals from the general population who did not receive mental health care at baseline and who completed the Community Assessment of Psychic Experiences (CAPE; Konings et al., 2006). Those who scored in the highest quartile of the positive symptoms subscale of the CAPE were enrolled in subgroup 1 ($n = 25$). As such, participants in subgroup 1 are considered to be at increased psychometric risk for psychosis. Participants in subgroups 2 ($n = 27$), 3 ($n = 24$), and 4 ($n = 20$) were receiving mental health care at baseline. Allocation to subgroups 2–4 was done

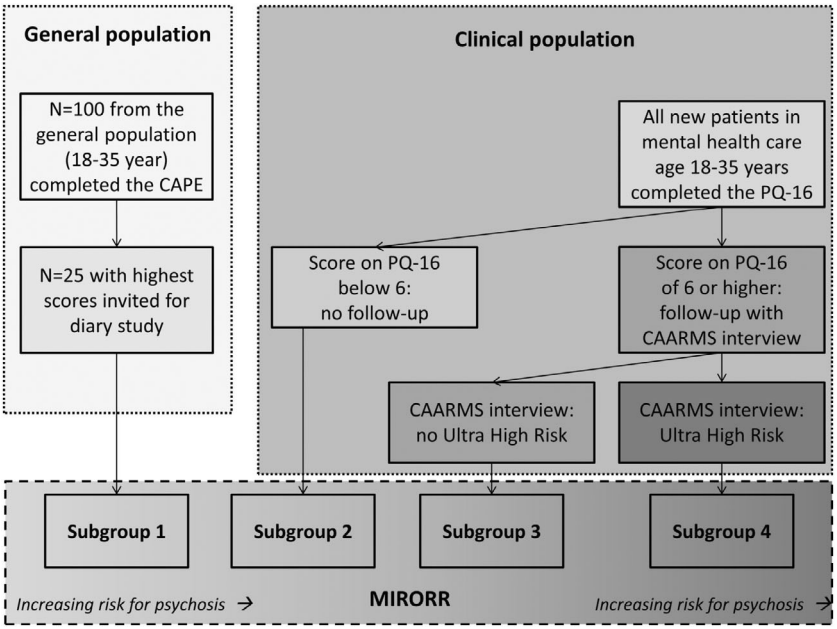

FIGURE 1 Definition of subgroups by Booij et al. (2018), licensed under CC BY-NC https://creativecommons.org/licenses/by-nc/4.0/

according to a two-step procedure applied in Dutch mental health care: first, individuals completed the Prodromal Questionnaire-16 (PQ-16; Ising et al., 2012). When scoring ≥6, the Comprehensive Assessment of At Risk Mental State (CAARMS; Yung et al., 2005) was administered to determine presence of Ultra High Risk (UHR) status for developing psychosis. Participants were allocated to subgroup 2 when scoring <6 on the PQ-16. Participants were allocated to subgroup 3 when scoring ≥6 on the PQ-16 but not considered UHR based on the CAARMS. Participants were allocated to subgroup 4 when scoring ≥6 on the PQ-16 and also considered UHR based on the CAARMS. Thus, subgroup 1 represents the lowest level of risk (stage 0) for psychosis and subgroup 4 the highest level of risk (stage 1b). Subgroups 2 and 3 both represent stage 1a, but differ in the amount of psychotic symptoms (subgroup 2 mild; subgroup 3 moderate).

2.3 | Measures

2.3.1 | Global cross-sectional measures

Participants completed online questionnaires on psychopathology, functioning, well-being and risk-and protective factors (Table 1). The mini-SCAN interview (Nienhuis et al., 2010), a structured clinical diagnostic interview, was assessed face-to-face.

2.3.2 | In-depth diary assessments

Diary assessments also covered psychopathology, functioning, well-being, and risk- and protective factors (Table S1). Diary items were mostly scored on a visual analogue scales (VAS) ranging from 0 to 100.

2.4 | Statistical analysis

2.4.1 | Cross-sectional assessments

Subgroups were compared using the Kruskal-Wallis test (continuous outcomes) and Chi-square test (dichotomous outcomes). If overall tests were significant, post hoc comparisons were conducted using false discovery rate correction.

2.4.2 | Diary assessments

Subgroups were compared through multilevel analyses. The final models included a time variable to control for trends and the lagged variable of the outcome variable to control for autocorrelation, both as fixed and random effects, allowing for individual differences in within-person variance. The models included a diagonal covariance structure for the random effects and within-individual variance was allowed to be heterogeneous. For dichotomous items, scores were averaged, and were interpreted as the proportion of the diary period that an item was endorsed by the participant. Differences in these proportion across subgroups were analysed with Kruskal-Wallis tests.

Multilevel analyses were performed with the lme function of the nlme package (V3.1-151; Pinheiro et al., 2021) in R (R Core Team, 2021). Multilevel models handle the missing outcome observations under the Missing at Random (MAR) assumption.

As this study was exploratory, we did not correct for multiple testing. In the Results and Discussion sections, we focus on patterns across multiple outcomes instead of individual results.

TABLE 1 Cross-sectional questionnaires assessed at baseline per domain

Domain	Questionnaire	Assessing	Reference
Psychopathology	Symptom Checklist Revised (SCL-90-R)	Broad range of symptom dimensions	Derogatis and Unger. *Symptom checklist-90-revised, Corsini encyclopedia of psychology*, 2010.
	Mini Schedules for Clinical Assessment in Neuropsychiatry (mini-SCAN)	Clinical diagnosis	Nienhuis et al. Validity of a short clinical interview for psychiatric diagnosis: The mini-SCAN. *Br J Psychiatry* 2010;196:64–68.
	Community Assessment of Psychic Experiences (CAPE)	Psychotic experiences	Konings et al. Validity and reliability of the CAPE: A self-report instrument for the measurement of psychotic experiences in the general population. *Acta Psychiatr Scand* 2006;114:55–61.
	Prodromal Questionnaire (PQ-16)	Psychotic experiences	Ising et al. The validity of the 16-item version of the Prodromal Questionnaire (PQ-16) to screen for ultra high risk of developing psychosis in the general help-seeking population. *Schizophr Bull* 2012;38:1288–1296.
	Depression, Anxiety and Stress Scale (DASS-21)	Depression, anxiety and stress	Lovibond and Lovibond. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the beck depression and anxiety inventories. *Behav Res Ther* 1995;33:335–343.
	Altman self-rating mania scale	Mania	Altman et al. The Altman self-rating mania scale. *Biol Psychiatry* 1997;42:948–955.
Functioning	Groninger Vragenlijst over Sociaal Gedrag (GVSG)	Social functioning	De Jong andvan der Lubbe. *Groningse vragenlijst over sociaal gedrag: zelfbeoordelingsvragenlijsten voor het vaststellen van problemen in het interpersoonlijke functioneren*. Handleiding: Rob Giel Onderzoekcentrum, 2001.
Well-being	Flourishing Scale (FS)	Flourishing	Diener et al. New well-being measures: Short scales to assess flourishing and positive and negative feelings. *Soc Indic Res* 2010;97:143–156.
Risk- and protective factors	Social Support List (SSL)	Social support	van Sonderen. Lijst–Interacties SS. *SSL-I) en sociale steun lijst-discrepanties (SSL-D): noorderlijk centrum voor gezondheids-vraagstukken*. Groningen, 1993.
	Brugha List of Threatening Events (LTE)	Life events	Brugha and Cragg. The list of threatening experiences: the reliability and validity of a brief life events questionnaire. *Acta Psychiatr Scan*, 1990; 82(1), 77–81.
	Brief Resilience Scale (BRS)	Resilience	Smith et al. The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med* 2008;15:194–200.
	Munich Chronotype Questionnaire (MCTQ)	Sleep	Roenneberg et al. Epidemiology of the human circadian clock. *Sleep Med Rev* 2007;11:429–438.
	Utrechtse Coping lijst (UCL)	Coping style	Schreurs and van de Willige. Omgaan met problemen en gebeurtenissen. De Utrechtse Coping Lijst (UCL) (Coping with problems and events. *The Utrecht Coping List* 1998.
	General health questionnaire	Lifestyle factors	Goldberg et al., Manual of the General Health Questionnaire, 1978. Windsor, England NFER Publishing.

3 | RESULTS

3.1 | Sample characteristics

Figure 2 shows participant inclusion. During data collection, the additional decision was made to exclude people with hormonal therapy, which led to an exclusion of $n = 2$ individuals. Participants were on average 24.7 (SD 4.2) years, mostly female (76%) and with upper secondary education (54.2%). No differences were found for age, gender ratio, or education level across subgroups. Mean number of clinical diagnoses increased per subgroup with differences between subgroup 1 and subgroups 2–4, and between subgroup 2 and subgroups 3 and 4. The most common diagnosis, overall and within each subgroup, was 'depression'. An average of 9% of diary data was missing per person (range 0%–23%).

3.2 | Psychopathology

3.2.1 | Cross-sectional assessments

Scores on almost all symptom dimensions increased across subgroups (Tables 2 and 3), except DASS-Stress and CAPE, where subgroup 3 scored slightly higher than subgroup 4. Additionally, as subgroup 1 was recruited based on high scores on positive psychotic experiences, subgroup 1 scored higher than subgroup 2 on CAPE-positive.

The increase between subgroups was not always linear or significant. For some measures, for example, DASS-Depression, subgroups 2–4 all differed from subgroup 1 but not from each other. For others, differences varied: for SCL-Anxiety, subgroup 4 scored higher than all other subgroups; for SCL-Interpersonal sensitivity, subgroups 3 and 4 both scored higher than subgroups 1 and 2, but subgroups 1 and 2 did not differ from each other, nor did subgroups 3 and 4. Positive and negative psychotic experiences were both more frequent and more distressing in subgroups 3 and 4.

3.2.2 | Diary assessments

Most negative affect and transdiagnostic item scores increased across subgroups, although subgroup 2 scored higher than 3 several times (e.g., *feeling worried*). Statistically, negative affect items often differentiated subgroups 2–4 from subgroup 1. In addition, subgroup 4 also often scored higher than subgroups 2 and 3. For the transdiagnostic domain, differences were often found between subgroups 3 and 4 versus subgroup 1.

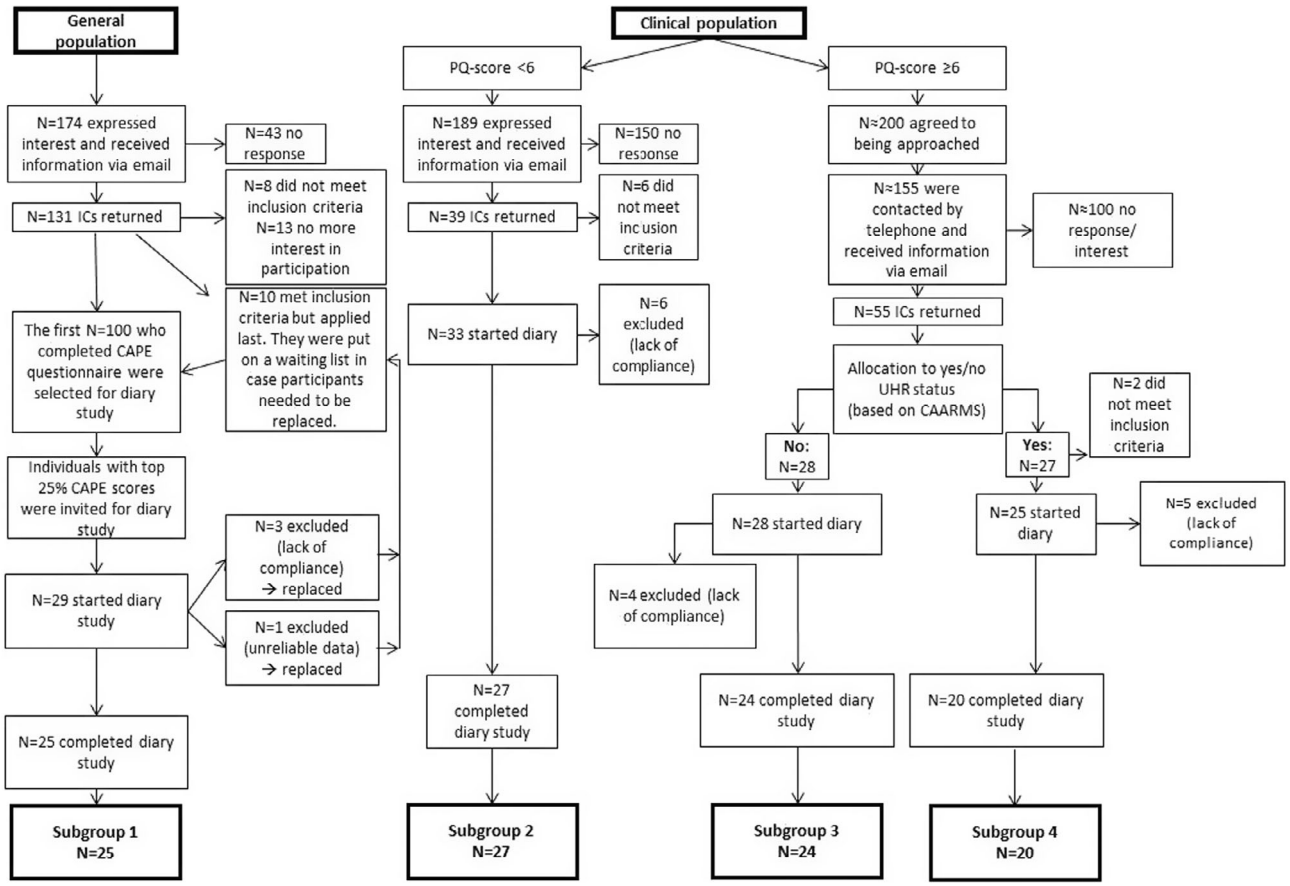

FIGURE 2 Flowchart of recruitment and inclusion of participants

TABLE 2 Cross-sectional questionnaires on psychopathology compared between the four subgroups

	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Total group	
	N = 25	*N* = 27	*N* = 24	*N* = 20	*N* = 96	Difference
Broad range of symptom dimensions (SCL-90)	Median (IQR)					
Total score	136.0 (52.0)	164.0 (64.0)	205.5 (69.3)	223.5 (87.5)	186.7 (59.4)	4,3,2 > 1
						4,3 > 2
Anxiety	14.0 (4.0)	18.0 (7.5)	21.0 (9.3)	28.5 (10.3)	19.0 (12.0)	4,3,2 > 1
						4 > 3,2
Agoraphobia	7.0 (1.0)	9.0 (6.0)	12.0 (4.3)	13.0 (11.0)	10.0 (6.0)	4,3,2 > 1
						4 > 2
Depression	25.0 (16.0)	36.0 (22.5)	42.0 (18.0)	45.5 (20.3)	38.0 (21.0)	4,3,2 > 1
						4 > 2
Somatization	16.0 (6.0)	20.0 (10.0)	25.0 (11.5)	24.0 (12.8)	22.0 (10.0)	4,3 > 1
Cognitive performance deficits	15.0 (9.0)	20.0 (9.0)	25.5 (11.3)	27.0 (9.3)	22.0 (11.0)	4,3,2 > 1
						4,3 > 2
Interpersonal sensitivity (distrust)	26.0 (14.0)	27.0 (11.0)	40.0 (13.8)	45.5 (19.8)	33.0 (18.3)	4,3 > 2,1
Hostility	7.0 (4.0)	8.0 (4.5)	10.0 (5.3)	10.5 (5.8)	9.0 (5.3)	4,3 > 1
Sleeping problems	5.0 (2.0)	6.0 (3.5)	9.0 (4.3)	8.5 (5.3)	7.0 (5.0)	4,3 > 2,1
Depression, Anxiety and Stress (DASS)						
Depression	4.0 (10.0)	12.0 (19.0)	13.0 (13.0)	20.0 (22.5)	12.0 (14.5)	4,3,2 > 1
Anxiety	2.0 (6.0)	8.0 (10.0)	10.0 (12.0)	15.0 (10.5)	8.0 (10.0)	4,3,2 > 1
						4 > 2
Stress	8.0 (12.0)	16.0 (8.0)	21.0 (8.5)	23.0 (15.0)	17.0 (16.0)	4,3,2 > 1
						4,3 > 2
Total score	16.0 (32.0)	38.0 (31.0)	44.0 (33.5)	54.0 (25.0)	40.0 (34.5)	4,3,2 > 1
						4 > 2
Psychotic experiences (CAPE)						
Positive frequency	22.0 (2.0)	22.0 (2.0)	26.0 (5.3)	25.5 (5.0)	23.0 (5.0)	4,3 > 2,1
Positive distress	4.0 (5.0)	4.0 (4.5)	7.0 (4.5)	10.0 (8.5)	5.0 (7.3)	4,3 > 2,1
Negative frequency	24.0 (5.0)	26.0 (9.5)	32.5 (7.5)	30.5 (12.8)	27.0 (11.3)	4,3 > 1, 3 > 2
Negative distress	18.0 (12.0)	20.0 (16.0)	30.0 (9.0)	29.0 (19.0)	23.5 (17.3)	4,3 > 1
Depression frequency	12.0 (4.0)	17.0 (6.0)	18.0 (7.3)	17.5 (7.3)	16.0 (7.0)	4,3,2 > 1
Depression distress	8.0 (10.0)	13.0 (12.0)	17.5 (7.8)	18.0 (8.5)	15.5 (13.0)	3 > 1
Total frequency	60.0 (13.0)	64.0 (15.0)	74.5 (16.0)	76.0 (22.8)	68.0 (22.0)	4,3 > 1, 3 > 2
Total distress	31.0 (28.0)	38.0 (29.0)	54.5 (23.0)	57.0 (23.5)	48.0 (32.0)	4,3 > 1, 3 > 2

Note: Differences for cross-sectional questionnaires are based on Kruskal-Wallis test, unless noted. If significant ($p < .05$), post-hoc comparisons were done with Wilcoxon rank sum test, with false discovery rate correction.
Abbreviation: IQR, inter quartile range.

TABLE 3 Diary items on psychopathology compared between the four subgroups

Diary assessments	Median (IQR)					
Negative affect						
Apathetic	13.8 (7.4)	19.3 (36.4)	21.1 (35.5)	42.9 (30.8)	19.4 (35.6)	4,3,2 > 1 4 > 3,2
Tired	21.9 (18.3)	47.2 (33.1)	50.0 (14.3)	66.9 (24.4)	46.7 (33.5)	4,3,2 > 1 4 > 3,2
Down	10.1 (11.1)	17.9 (30.7)	15.1 (35.5)	49.9 (35.5)	17.8 (36.4)	4,3,2 > 1 4 > 3,2
Anxious	6.5 (4.9)	16.7 (23.2)	18.7 (41.4)	31.8 (26.0)	15.7 (25.8)	4,3,2 > 1 4 > 2
Restless	13.3 (19.2)	33.9 (33.3)	35.5 (30.1)	49.4 (33.1)	32.7 (34.7)	4,3,2 > 1 4 > 3,2 4 > 2
Empty	8.4 (6.7)	15.3 (31.8)	10.7 (33.8)	41.7 (42.2)	12.5 (37.5)	4,3,2 > 1 4 > 3,2
Transdiagnostic items						
Worried	8.4 (9.1)	24.0 (31.2)	17.9 (41.8)	45.1 (31.5)	21.1 (34.6)	4,3,2 > 1 4 > 2
Irritable	7.2 (7.5)	13.2 (19.9)	23.8 (31.6)	41.1 (23.0)	15.7 (33.0)	4,3 > 2,1
Irritated	11.6 (16.1)	13.2 (20.8)	21.6 (28.8)	43.6 (22.8)	19.3 (31.2)	4,3 > 1
Stressed	22.4 (13.0)	29.9 (20.6)	44.6 (23.6)	48.8 (30.9)	29.9 (26.5)	4,3 > 1 4 > 2
Feeling of falling short	13.5 (12.5)	25.6 (25.5)	27.1 (32.0)	34.3 (28.7)	22.1 (26.9)	4,3,2 > 1
Bothered by physical symptoms	14.2 (14.3)	26.8 (34.1)	42.3 (31.1)	51.4 (26.1)	28.3 (36.6)	4,3 > 1 4 > 2
Not getting many things done	22.1 (14.5)	30.4 (20.7)	31.1 (29.9)	30.7 (27.2)	27.8 (22.4)	3 > 1
Doing things on automatic without being conscious of what I was doing	13.5 (18.7)	16.9 (31.3)	15.6 (42.5)	34.7 (34.2)	19.6 (38.3)	4 > 2,1
Psychotic experiences						
Feeling very special—continuous	11.2 (20.7)	6.5 (31.8)	4.9 (15.6)	8.6 (19.9)	7.1 (20.6)	n/a[a]
—dichotomized[a]	0.5 (0.4)	0.5 (0.4)	0.4 (0.4)	0.5 (0.4)	0.5 (0.4)	Ns
Feeling suspicious	6.1 (5.4)	4.1 (11.0)	5.2 (13.3)	24.6 (33.6)	7.0 (17.1)	4,3 > 1 4 > 3,2
Feeling that others could read my thoughts—continuous	4.4 (3.0)	2.5 (2.4)	1.5 (3.6)	5.6 (11.0)	3.1 (5.6)	n/a[a]
—dichotomized[a]	0.1 (0.2)	0.1 (0.2)	0.2 (0.3)	0.4 (0.4)	0.2 (0.3)	4 > 2,1
Feeling unreal	4.4 (3.6)	2.5 (7.6)	2.5 (3.6)	19.7 (39.8)	4.1 (8.5)	4 > 3,2,1
Feeling that others could control me—continuous	4.4 (3.0)	2.8 (2.9)	2.7 (7.5)	7.2 (19.5)	3.7 (7.3)	n/a[a]
—dichotomized[a]	0.2 (0.2)	0.1 (0.3)	0.3 (0.3)	0.5 (0.4)	0.3 (0.3)	4 > 2

(Continues)

TABLE 3 (Continued)

Diary assessments	Median (IQR)					
Feeling that others did not like me	6.6 (6.9)	4.8 (10.5)	13.4 (21.2)	14.6 (40.4)	8.8 (13.5)	4,3 > 1 4 > 2
Having the tendency to do something unrestrained	5.11 (3.6)	3.9 (11.2)	5.3 (17.3)	15.7 (18.6)	5.4 (11.7)	4,3 > 1
My thoughts would not leave me alone	7.9 (7.4)	17.4 (33.0)	20.4 (39.0)	31.1 (39.0)	14.4 (36.5)	4,3 > 1
My thoughts were racing	5.0 (3.5)	4.3 (14.4)	9.5 (19.7)	20.9 (44.7)	5.7 (15.0)	4,3 > 1 4 > 3,2
My thoughts were difficult to express	5.1 (5.4)	6.3 (18.5)	25.4 (42.9)	39.7 (35.0)	11.6 (30.5)	4,3 > 2,1
Psychotic experiences, scored 1–7, mean (SD) freq > 1						
Something strange happened to me or around me that was difficult to explain	2.0 (5.4)	1.0 (2.0)	9.1 (22.6)	4.3 (9.3)	4.0 (4.0)	ns[a]
Hearing voices that others could not hear	0.2 (0.6)	0.2 (1.0)	4.6 (16.3)	7.5 (21.0)	2.8 (2.8)	ns[a]
Seeing things that others could not see	0.3 (0.7)	0.4 (0.9)	7.9 (20.3)	7.3 (20.3)	3.7 (3.7)	ns[a]

Note: Differences for diary data are based on multilevel models unless noted. Diary assessments are on a vas-scale 0–100 unless noted.
Abbreviations: IQR, inter quartile range; ns, non-significant.
[a]The items were too highly zero-skewed to analyse the data as continuous outcome in a multilevel context. The data was dichotomized (0 (≤10) 1 (>10)), and person-specific average proportions of 1 was assessed with Kruskal-Wallis test.

Regarding psychotic experiences, we saw roughly two patterns of (i) increasing levels across subgroups, and (ii) higher scores in specifically subgroup 4. For several items, for example, *racing thoughts*, *feeling suspicious* and *feeling unreal*, differences were large. Although daily reports of *hearing voices* or *seeing things* were not very common and subgroups did not differ statistically, subgroups 3 and 4 reported more often *seeing things* and especially subgroup 4 reported *hearing voices*. Subgroup 4 also reported more feelings of *apathy*, *tiredness*, *down*, *restlessness*, and *emptiness*, reflecting negative psychotic experiences.

3.2.3 | Descriptive comparison of assessment methods

Cross-sectional and diary assessments aligned in that the three clinical subgroups scored higher than subgroup 1 on most psychopathological domains. Some differences were found between the two assessment methods; for example, *stress* differed between subgroups 1 and 2 and between subgroups 2 and 3 on cross-sectional but not diary assessments, and subgroups 1 and 2 differed from subgroup 3 on cross-sectional, but not on most daily, positive psychotic experiences.

3.3 | Functioning

3.3.1 | Cross-sectional assessments

Subgroups 1 functioned better than the other subgroups regarding *job* and *household* (Tables 4 and 5). Subgroups 3 and 4 also scored worse for *spare time*, and subgroup 3 also for *parents*. Although mean levels of functioning for *partner*, *friends* and *study* did not differ between subgroups, the percentage of individuals within each subgroup for which these areas applied, was lower in the higher subgroups for *partner* and *study*.

3.3.2 | Diary assessments

Daily functioning decreased across subgroups, with subgroup 1 functioning higher than the other subgroups.

3.3.3 | Descriptive comparison of assessment methods

The daily functioning item mainly reflected one's perceived ability to do regular things (e.g., [voluntary] work, seeing friends) and can therefore not be directly compared to the cross-sectional assessments.

3.4 | Well-being

3.4.1 | Cross-sectional assessments

Psychological well-being decreased across subgroups (Tables 6 and 7), with subgroup 1 reporting higher well-being than the other subgroups.

TABLE 4 Cross-sectional questionnaires on functioning compared between the four subgroups

	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Total group	
	N = 25	*N* = 27	*N* = 24	*N* = 20	*N* = 96	Difference
Cross-sectional assessment						
Social functioning	*Percentage applicable*, Median (IQR)					
Parents	96%, 17.0 (3.3)	100%, 16.0 (3.5)	100%, 12.0 (4.5)	90%, 13.5 (6.5)	97%, 16.0 (6.0)	3 < 2,1
Partner	75%, 18.0 (4.5)	59%, 16.0 (3.0)	42%, 16.0 (1.8)	40%, 15.5 (1.8)	54%, 16.0 (3.0)	Ns
Friends	96%, 15.5 (2.3)	96%, 14.0 (5.0)	83%, 13.5 (4.5)	90%, 12.5 (5.0)	92%, 14.0 (5.0)	Ns
Study	64%, 15.5 (3.3)	44%, 15.0 (3.3)	21%, 12.0 (1.0)	30%, 11.0 (4.3)	41%, 14.0 (4.0)	Ns
Job	64%, 16.0 (1.3)	56%, 14.0 (3.5)	54%, 15.0 (4.0)	55%, 14.0 (2.5)	57%, 15.0 (3.0)	4,3,2 < 1
Household	84%, 17.0 (2.0)	74%, 14.0 (4.0)	88%, 13.0 (5.0)	85%, 14.0 (3.0)	82%, 14.0 (5.0)	4,3,2 < 1
Spare time	100%, 14.0 (2.0)	100%, 13.0 (5.5)	100%, 11.0 (4.0)	100%, 11.0 (3.3)	100%, 13.0 (5.0)	4,3 < 1
Mean total score	100%, 15.8 (2.0)	100%, 14.7 (2.3)	100%, 12.9 (2.5)	100%, 12.9 (1.4)	100%, 14.1 (2.9)	4,3,2 < 1

Note: Differences for cross-sectional questionnaires are based on Kruskal-Wallis test, unless noted. If significant ($p < .05$), post-hoc comparisons were done with Wilcoxon rank sum test, with false discovery rate correction. ns = non-significant. Although questions about having (young) children were asked, data are not shown, as these categories were not applicable for most participants.

TABLE 5 Diary items on functioning compared between the four subgroups

	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Total group	
	N = 25	*N* = 27	*N* = 24	*N* = 20	*N* = 96	Difference
Diary assessment	Median (IQR)					
Daily functioning	59.19 (14.45)	50.84 (7.64)	50.51 (7.09)	49.78 (9.76)	52.23 (11.06)	4,3,2 < 1

Note: Differences for diary data are based on multilevel models unless noted. Diary assessments are on a vas-scale 0–100 unless noted.

TABLE 6 Cross-sectional questionnaires on well-being compared between the four subgroups

	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Total group	
	N = 25	*N* = 27	*N* = 24	*N* = 20	*N* = 96	Difference
Cross-sectional assessment	Median (IQR)					
Flourishing	44.0 (7.0)	35.0 (15.5)	33.0 (12.0)	31.5 (17.0)	36.0 (17.0)	4,3,2 < 1

Note: Differences for cross-sectional data based on Kruskal-Wallis test, unless noted. If significant ($p < .05$), post-hoc comparisons were done with Wilcoxon rank sum test, with false discovery rate correction.
Abbreviation: IQR, inter quartile range.

3.4.2 | Diary assessments

Compared to subgroup 1, subgroups 2–4 reported lower scores on *life satisfaction* and almost all *positive affect* items (e.g., *cheerful*).

3.4.3 | Descriptive comparison of assessment methods

Cross-sectional and diary assessments aligned in that *well-being* discriminated between subgroup 1 and the other subgroups, but not between subgroups 2–4.

3.5 | Risk- and protective factors

3.5.1 | Cross-sectional assessments

Differences between subgroups were present on three subscales and absent on five subscales of experienced social interactions (Tables 8 and 9). Differences were more pronounced in experienced discrepancies, with subgroup 3 reporting more need for support than the other subgroups on almost all subscales. *Life events* diverged for *positive*, but not *negative events*: subgroups 4 and 2 (but not 3) experienced less *positive life events* over the past year. *Resilience* was higher in subgroup 1. Several differences were found for *coping*. Subgroup 1 less

TABLE 7 Diary items on well-being compared between the four subgroups

Diary assessments						
Positive affect	Median (IQR)					
Relaxed	57.2 (18.1)	49.6 (15.9)	49.5 (14.0)	48.5 (20.3)	50.1 (17.6)	4,3,2 < 1
Calm	64.6 (17.7)	49.7 (6.3)	50.8 (15.9)	40.0 (17.2)	51.9 (15.0)	4,3,2 < 1
Satisfied	66.1 (19.2)	52.9 (30.2)	52.3 (14.0)	52.5 (18.1)	54.4 (19.5)	4,3,2 < 1
Energetic	57.6 (22.4)	37.1 (23.0)	40.6 (17.4)	40.7 (23.4)	45.2 (24.5)	4,3,2 < 1
Enthusiastic	62.3 (19.5)	50.6 (23.3)	49.1 (26.1)	49.8 (28.6)	51.7 (28.6)	4,3,2 < 1
Cheerful	60.7 (14.4)	48.4 (25.1)	47.6 (17.4)	41.2 (27.2)	50.4 (24.2)	4,3,2 < 1
Talkative	51.6 (23.7)	48.2 (18.9)	45.0 (23.9)	46.0 (15.3)	48.2 (19.4)	3 < 1
Confident	58.5 (23.6)	37.5 (20.1)	48.7 (28.9)	35.5 (28.6)	48.5 (29.8)	4,3,2 < 1
Could experience pleasure when nice things happened	68.7 (12.9)	55.6 (23.4)	53.5 (18.6)	50.2 (25.9)	61.0 (22.6)	4,3,2 < 1
Felt like undertaking things	48.2 (23.4)	36.8 (28.2)	40.4 (28.0)	41.6 (23.2)	46.8 (22.4)	4,3,2 < 1
Concentration						
Could concentrate well	56.0 (19.4)	39.6 (19.0)	43.96 (16.5)	44.4 (12.8)	46.6 (16.9)	4,3,2 < 1
Life satisfaction						
Found my life worthwhile	68.1 (19.6)	51.95 (20.4)	51.58 (20.8)	51.2 (26.4)	55.1 (23.7)	4,3,2 < 1

Note: Differences for diary data are based on multilevel models unless noted. Diary assessments are on a vas-scale 0–100 unless noted.
Abbreviation: IQR, inter quartile range.

often exhibited *passive coping*; subgroup 2 also showed less *passive coping* than subgroups 3 and 4. In addition, subgroup 4 less often reported *active coping* than subgroup 1, more often *avoidance coping* than subgroup 1 and 2, and subgroup 2 and 4 less often used *reassuring thoughts* than subgroup 1.

3.5.2 | Diary assessments

For *social support*, differences emerged mainly between subgroup 4 and subgroup 1 and/or 2. Subgroup 4 *preferred more company*, *preferred more support*, and felt that *the person* [they talked to] *was more critical towards them* and *more interfering*. *Daily positive events* were experienced more often in subgroup 1. The *pleasantness of events* also differed, with subgroup 3 and 4 scoring lower than subgroup 1, and subgroup 4 lower than subgroup 2. Subgroup 2 *looked less forward to events* than subgroup 1. Subgroups 2–4 experienced more *negative events*. *Negative events* were also more important for subgroup 2 and 3, compared to 1. The most *exciting or stressful event of the day* was positive in about one-third of cases in all subgroups. However, these events were experienced as less exciting/more stressful by subgroup 4 compared to subgroups 1 and 2. *Resilience* and *optimism* were higher in subgroup 1. For *coping*, only *palliative reactions* were reported more frequently for subgroup 2 and 4 compared to subgroup 1.

3.5.3 | Descriptive comparison of assessment methods

Few differences were found for experienced social support regardless of assessment method. Discrepancies existed between actual and desired support in both assessment methods. Cross-sectionally, especially subgroup 3 reported more discrepancies, whereas subgroup 4 preferred more company and more social support on a daily basis. Subgroups differed regarding cross-sectionally assessed positive, but not negative, life events. Subgroups differed on the amount of both positive and negative daily events and their appraisal of positive events. Results for resilience and optimism converged for both assessment types. Subgroup 4 differed from the other subgroups on several cross-sectional coping styles, but only on palliative reactions in daily coping styles.

4 | DISCUSSION

We compared individuals in different early clinical stages of risk for psychosis on psychopathology, well-being, functioning and factors of risk and protection using cross-sectional and daily diary assessments. As a consequence of subgroup allocation, the subgroups by definition differed in severity of positive psychotic experiences; the additional differences in general psychopathological severity confirmed our interpretation of the subgroups as representing increasingly severe (though still early) clinical stages. This study reports how the subgroups displayed a nuanced profile of differences and similarities, not only in measures of psychopathology, but also in measures of functioning, well-being and diary reports. The largest gap between subgroups was sometimes between subgroups 1 versus the other subgroups (suggesting largest differences between non-clinical and clinical populations), sometimes between subgroups 1 and 2 versus subgroups 3 and 4 (suggesting largest differences between those with and without substantial psychotic experiences) and sometimes between subgroup 4 versus the other subgroups (suggesting specific patterns for those at UHR for psychosis). These findings suggest that progression through early clinical stages is an individual, complex process that manifests differently at different levels (i.e., globally or daily).

TABLE 8 Cross-sectional questionnaires on risk- and protective factors compared between the four subgroups

	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Total group	
	N = 25	*N* = 27	*N* = 24	*N* = 20	*N* = 96	Difference
Cross-sectional assessments						
Social support	Median (IQR)					
Interactions						
Everyday emotional interaction	12.0 (1.0)	10.0 (3.0)	9.0 (3.3)	9.5 (3.0)	10.0 (4.0)	4,3,2 < 1
Emotional support with problems	19.0 (3.0)	18.0 (6.0)	19.0 (5.8)	19.0 (9.8)	18.0 (6.0)	ns
Esteem support	16.0 (3.0)	14.0 (4.0)	15.5 (5.5)	14.0 (4.3)	15.0 (5.0)	ns
Instrumental support	13.0 (3.0)	12.0 (2.0)	11.5 (4.3)	12.0 (5.5)	12.0 (3.0)	ns
Social companionship	12.0 (2.0)	11.0 (3.0)	9.0 (2.5)	11.0 (4.0)	11.0 (4.0)	3 < 1
Informative support	8.0 (1.0)	8.0 (2.0)	8.0 (2.0)	8.0 (2.0)	8.0 (2.0)	ns
Total score	81.0 (10.0)	75.0 (16)	71.0 (14.8)	76.0 (29.0)	76.0 (17.3)	ns
Negative support	9.0 (4.0)	10.0 (4.5)	13.0 (5.3)	13.5 (6.8)	11.0 (6.0)	3 > 2,1
Discrepancies						
Everyday emotional interaction	5.0 (3.0)	7.0 (4.0)	9.0 (3.3)	6.5 (5.5)	7.0 (5.0)	3 > 1
Emotional support with problems	11.0 (4.0)	14.0 (7.0)	16.0 (6.3)	14.0 (8.5)	14.0 (7.3)	3 > 1
Esteem support	8.0 (3.0)	9.0 (5.0)	10.5 (4.3)	10.5 (5.3)	9.0 (5.0)	3 > 2,1
Instrumental support	8.0 (2.0)	8.0 (3.0)	9.5 (5.3)	10.0 (4.3)	9.0 (3.3)	4,3 > 1
Social companionship	8.0 (4.0)	8.0 (6.0)	12.0 (5.0)	10.0 (5.0)	9.0 (6.0)	3 > 2,1
Informative support	6.0 (2.0)	6.0 (3.0)	7.0 (3.3)	6.5 (4.0)	6.0 (3.0)	ns
Total score	48.0 (9.0)	55.0 (21.5)	65.5 (18.5)	60.5 (23.5)	55.0 (22.3)	3 > 2,1
Life events	Average no.					
Past year positive life events	4.0 (1.0)	2.0 (1.0)	3.0 (1.3)	2.0 (2.0)	3.0 (2.0)	2,4 < 1
Past year negative life events	2.0 (1.0)	1.0 (2.0)	1.0 (2.0)	2.0 (2.3)	1.5 (2.0)	ns
Resilience	Mean (SD)					
	3.0 (0.8)	2.5 (1.0)	2.6 (1.1)	2.3 (0.4)	2.7 (1.0)	4,3,2 < 1
Sleep	Hours					
Sleep workdays						
Sleep latency	0.3 (0.3)	0.3 (0.5)	0.5 (0.6)	0.5 (0.7)	0.3 (0.5)	ns
Sleep onset	24.3 (0.9)	23.3 (1.6)	24.5 (2.1)	25.0 (0.9)	24.3 (1.8)	4 > 2
Sleep duration	7.6 (0.9)	7.8 (1.3)	7.5 (1.6)	7.3 (1.4)	7.5 (1.4)	ns
Time of waking up	7.7 (1.1)	7.2 (1.5)	7.5 (1.1)	7.9 (2.0)	7.5 (1.0)	ns

(Continues)

TABLE 8 (Continued)

	Subgroup 1	Subgroup 2	Subgroup 3	Subgroup 4	Total group	
	N = 25	*N* = 27	*N* = 24	*N* = 20	*N* = 96	Difference
Sleep free days						
Sleep latency	0.3 (0.3)	0.3 (0.3)	0.5 (0.8)	0.8 (0.7)	0.4 (0.4)	4 > 2,1
Sleep onset	24.8 (1.0)	24.0 (2.8)	25.4 (1.7)	25.5 (1.3)	25.1 (2.1)	ns
Sleep duration	8.8 (1.0)	8.6 (1.7)	7.7 (2.1)	8.8 (2.8)	8.5 (1.9)	3 < 1
Time of waking up	9.5 (1.3)	9.5 (2.0)	8.5 (2.5)	9.8 (2.2)	9.4 (2.0)	ns
Coping style	Median (IQR)					
Active problem solving	17.0 (4.0)	16.0 (5.0)	17.0 (8.0)	14.0 (2.3)	15.5 (6.0)	4 < 1
Palliative reactions	20.0 (4.0)	19.0 (3.0)	19.0 (4.3)	19.0 (2.0)	19.0 (4.0)	ns
Avoidance	17.0 (3.0)	16.0 (3.5)	18.0 (4.0)	19.5 (4.3)	17.0 (4.0)	4 > 2,1
Seeking social support	15.0 (7.0)	14.0 (6.0)	11.0 (4.5)	13.5 (4.0)	14.0 (7.0)	ns
Passive reactions	13.0 (4.0)	16.0 (4.5)	16.0 (5.3)	17.5 (6.0)	16.0 (5.0)	4,3,2 > 1 4 > 2
Expression of emotions	6.0 (3.0)	6.0 (2.0)	6.5 (2.3)	5.5 (3.0)	6.0 (2.0)	ns
Reassuring thoughts	13.0 (4.0)	10.0 (2.5)	12.0 (2.5)	11.0 (1.3)	11.0 (3.0)	4,2 < 1
Other lifestyle factors	% Yes					
Current use of sleeping pills	8.0	11.1	16.7	40.0	17.7	4 > mean*
Current use of (soft) drugs / stimulants	28.0	33.3	41.7	20.0	31.3	ns
Current smoking (% yes, mean no of smoked cigarettes among smokers	20.0 3.5	18.5 3.8	20.8 9.8	45.0 15.7	25.0 9.4	ns
Current alcohol use (% yes, mean no of units of alcohol per week)	88.0 5.6	85.2 4.4	62.5 5.8	80.0 2.5	79.2 4.6	ns
Exercise (% yes, mean no of exercise bouts per week)	76.0 2.8	74.1 2.6	58.3 3.2	45.0 3.6	64.6 3.0	ns

Note: Differences for cross-sectional questionnaires are based on Kruskal-Wallis test, unless noted. If significant ($p < .05$), post-hoc comparisons were done with Wilcoxon rank sum test, with false discovery rate correction.

Abbreviations: IQR, inter quartile range; ns, non-significant.

TABLE 9 Diary items on risk- and protective factors compared between the four subgroups

Diary assessments						
Social support	Median (IQR)					
Daily social support						
How much was I alone today? (Not at all 1–7 all day)	2.0 (1.0)	2.0 (1.5)	2.0 (2.3)	2.5 (2.3)	2.0 (1.5)	ns[a]
I would have preferred more company	8.6 (11.1)	13.3 (17.7)	4.6 (21.6)	22.6 (35.8)	17.7 (19.3)	4 > 3,1[c]
I found the company mostly… (very unpleasant-very pleasant)	70.3 (13.0)	71.4 (17.5)	62.1 (20.2)	61.1 (18.9)	66.6 (14.8)	3 < 2,1[c]
Did you feel supported today?	51.9 (30.0)	48.7 (39.7)	49.3 (16.0)	52.2 (14.9)	50.1 (25.1)	ns
I would have liked to feel more support	17.1 (29.2)	23.4 (39.6)	34.6 (47.1)	41.8 (25.9)	26.8 (40.4)	4 > 1
Most important interaction of the day						
Have you had a conversation with someone today? (mean % yes)	78.2 (28.0)	73.5 (27.5)	77.0 (27.8)	73.1 (29.8)	75.5 (27.8)	ns
How critical was this person towards you?	23.9 (22.8)	15.9 (21.7)	22.7 (31.7)	36.6 (32.9)	26.8 (20.7)	4 > 2[c]
How warm was this person towards you?	69.8 (17.1)	77.2 (27.0)	61.9 (28.3)	71.0 (16.0)	69.7 (18.6)	ns[d]
To what extent did this person interfere too much with you?	10.5 (13.0)	9.6 (15.3)	12.0 (23.7)	19.3 (12.8)	18.2 (19.7)	4 > 2,1[d]
Felt connected with this person	77.0 (21.2)	76.7 (32.3)	59.8 (38.5)	71.4 (22.4)	71.5 (20.9)	ns[d]
Daily events	Median (IQR)					
Positive events						
To what extent did positive events happen today?	58.6 (20.60)	51.9 (19.5)	50.5 (11.7)	49.4 (28.4)	51.6 (15.0)	4,3,2 < 1
How pleasant was the most positive event of today?	72.00 (17.3)	63.2 (23.6)	58.0 (43.1)	50.6 (38.1)	62.3 (30.3)	4,3 < 1 4 < 2
How important was the most positive event of today?	61.5 (20.1)	60.6 (18.8)	58.5 (13.5)	51.9 (17.3)	59.6 (17.4)	ns
Was this positive event planned? (mean % yes)	38.8 (14.8)	33.4 (17.2)	35.0 (19.2)	28.7 (15.6)	34.2 (16.9)	ns[a]
I was looking forward to it	66.6 (14.8)	55.3 (20.0)	58.6 (20.45)	62.2 (16.5)	60.4 (16.7)	2 < 1
Negative events						
To what extent did negative events happen today?	23.4 (7.4)	32.7 (18.0)	29.0 (29.4)	37.5 (23.0)	28.9 (20.9)	4,3,2 > 1
How unpleasant was the most negative event of today?	55.4 (43.1)	51.9 (35.2)	62.1 (51.0)	39.0 (29.4)	52.7 (41.1)	ns
How important was the most negative event of today?	49.6 (17.8)	50.4 (7.6)	51.7 (12.5)	51.9 (6.1)	50.4 (7.7)	3,2 > 1
Was this negative event planned? (mean % yes)	8.6 (6.2)	5.6 (4.3)	11.3 (9.8)	7.05 (4.3)	8.1 (6.8)	ns[a]
I dreaded it	48.9 (35.8)	57.7 (26.1)	58.6 (31.1)	71.5 (25.7)	57.9 (22.2)	n/a[b]
Stressfulness events						
Which event was most exciting or stressful? (mean % positive)	42.1 (16.4)	31.9 (15.8)	36.9 (19.5)	32.8 (18.0)	36.0 (17.6)	ns[c]
How exciting or stressful was this positive event?	35.1 (27.4)	35.2 (25.8)	37.7 (28.4)	47.7 (27.3)	38.1 (27.6)	4 > 2,1
How exciting or stressful was this negative event?	45.0 (27.6)	48.5 (27.3)	56.2 (28.6)	55.4 (25.9)	51.1 (27.8)	4,3 > 1 4 > 2

(Continues)

TABLE 9 (Continued)

Diary assessments						
Resilience and optimism	Median (IQR)					
Could handle what came my way	67.0 (17.9)	50.0 (11.9)	52.7 (15.7)	51.5 (13.4)	53.7 (17.3)	4,3,2 < 1
I look forward to tomorrow	55.1 (20.1)	51.1 (26.5)	50.0 (12.3)	50.5 (17.5)	50.5 (17.5)	4,3,2 < 1
Sleep			Median (IQR)			
Quality of sleep	63.5 (14.8)	50.1 (7.8)	49.2 (15.1)	50.8 (13.6)	51.3 (15.4)	4,3,2 < 1
Sleep duration night (hours)	7.5 (0.5)	7.8 (0.8)	7.09 (1.1)	6.9 (1.6)	7.4 (1.1)	4 < 1 4,3 < 2
Sleep during the day (mean no of days (SD))	9.4 (7.6)	13.4 (12.4)	15.4 (14.8)	9.2 (10.7)	12.0 (11.8)	ns
Sleep duration day (mean hours when slept that day)	1.0 (0.6)	1.3 (0.6)	1.5 (0.9)	2.0 (1.2)	1.4 (0.9)	4 > 1
Coping	Mean % of days that coping style was used					
Active problem solving	22.0 (15.6)	21.4 (14.0)	20.3 (21.5)	22.5 (18.3)	21.5 (17.2)	ns
Palliative reactions	8.5 (9.0)	18.5 (18.0)	19.1 (20.9)	26.3 (27.1)	17.7 (20.0)	2,4 > 1
Avoidance	7.6 (7.1)	8.1 (6.3)	16.3 (19.2)	7.7 (8.0)	9.9 (11.8)	ns
Seeking social support	24.2 (16.0)	20.3 (15.6)	20.0 (14.3)	26.0 (22.2)	22.4 (16.9)	ns
Passive reactions	12.4 (13.0)	18.4 (19.6)	20.3 (20.6)	25.7 (27.1)	18.8 (20.5)	ns
Expression of emotions	12.4 (10.7)	11.1 (7.2)	13.9 (10.6)	16.7 (15.4)	13.3 (11.0)	ns
Reassuring thoughts	10.4 (8.7)	22.1 (22.0)	12.6 (13.1)	16.6 (18.7)	15.5 (16.9)	ns
Mindful	9.8 (10.8)	15.7 (20.4)	10.0 (11.1)	11.2 (13.0)	11.8 (14.6)	ns
Other lifestyle factors	Median (IQR)					
Daily physical activity	48.1 (23.4)	31.1 (16.2)	38.8 (23.8)	47.7 (17.4)	39.0 (23.2)	2 < 1

Note: Differences for diary data are based on multilevel models unless noted. Diary assessments are on a vas-scale 0–100 unless noted.
Abbreviations: IQR, inter quartile range; ns, non-significant.
[a]Based on Chi-square test.
[b]The items were too highly zero-skewed to analyse the data as continuous outcome in a multilevel context. The data was dichotomized (0 (≤10) 1 (>10)), and person-specific average proportions of 1 was assessed with Kruskal-Wallis test.
[c]Item was conditional on another item.
[d]Item was conditional on another item and too few observations were available for analysis (on overage 6.5 data points per person).

Previous work has shown that the qualitative nature of psychotic symptoms changes when individuals transition from UHR to first episode of psychosis (e.g., symptoms moving from being vague to specific and concrete) (Marshall et al., 2019). The large differences between subgroup 4 and the other subgroups regarding daily (positive and negative) psychotic experiences suggests that qualitative differences may also emerge in earlier clinical stages and that these can be traced in daily life.

Regarding functioning, two conclusions can be drawn. First, functional challenges already exist in early clinical stages, as individuals in the clinical subgroups were less likely to have contact with their parents, have a partner, friends, or a job/study. Second, if individuals *did* have a partner, friend or job/study, they were generally just as satisfied as individuals from the non-clinical subgroup. This highlights the importance of supporting individuals to maintain these domains as much as possible, as they may form important sources of life satisfaction.

Well-being differentiated only broadly between non-clinical and clinical subgroups. Although well-being overall decreased, the three clinical groups did not differ. Tentatively, this could suggest that the decision to seek mental health care may be driven not only by an increase in psychopathology, but by an additional decrease in/persistent low levels of well-being, fitting with the idea of mental illness and well-being as two correlated but separate dimensions (Bos et al., 2016; Keyes, 2005). Another explanation could be that well-being is relatively low while one experiences psychopathology (i.e., for subgroups 2–4) but may increase (again) when symptoms stabilize/recover (Slade, 2010). However, the fact that we assessed well-being less thoroughly than psychopathology could also explain the lack of differentiation in well-being between the three clinical subgroups.

Regarding risk and protective factors, we highlight three findings. First, subgroups differed in *need for* social support, but not actual support. Second, reports of daily events corroborates this importance of subjective experience. The more severe subgroups experienced more negative and less positive daily events and rated them more negative and less positive, respectively. This may suggest that daily hassles impact more strongly on individuals in more severe stages, in line with suggested increased stress sensitization in individuals liable for psychosis (Collip et al., 2008) or psychopathology in general (Harkness et al., 2015). Finally, individuals in more severe subgroups reported more non-adaptive coping and less adaptive coping. Although causality cannot be inferred, this may suggest that individuals with more severe illness are less able to handle stress. These results tentatively suggest that individuals in clinical subgroups perceive the world around them in a more negative, stressful way and feel less able to deal adequately with stress.

Notably, subgroup 3, although at lower risk than subgroup 4, reported more need for support than subgroup 4. This could be explained by the fact that individuals at UHR for psychosis are offered additional care for their psychotic symptoms. Although having fewer psychotic symptoms, individuals who do not qualify as UHR can still experience considerable distress and specific need for care (Fusar-Poli et al., 2014).

Mirorr is one of the first studies to combine cross-sectional and daily diary assessments covering multiple domains to empirically investigate the clinical staging model. This allows for unique, in-depth characterization of early clinical stages. Because of the focus on the *development* of psychosis, only early clinical stages indexing risk for psychosis were included, while other disorders (e.g., depression) were present in most clinical participants. The inclusion criteria for the subgroups were deliberately broad. Although this led to large heterogeneity within the subgroups, this approach has resulted in a subsample that can be considered representative of young individuals in early clinical stages. This heterogeneity is also seen in the diversity of treatments of individuals in subgroups 2–4, which reflects the broad range of backgrounds of individuals with psychosis risk. Because of this, we could not statistically compare the groups on type of treatment they received. Although participants for subgroup 1 were randomly recruited (e.g., through advertisement in supermarkets, gyms, etc. as well as online), selection bias cannot be fully excluded (e.g., those with more interest in mental health might have been more likely to respond). The number of participants per subgroup is relatively small; in addition, we compared the subgroups on a large number of variables, which increased the possibility of chance findings. Thus, subgroup comparisons should be interpreted cautiously. The approach we have taken in this paper was a descriptive one, aiming to broadly characterize our subgroups rather than test specific hypotheses. Therefore, we focused on patterns of differences and similarities between the subgroups rather than individual results. The daily items reflect experiences of psychopathological symptoms rather than symptoms in the strictest clinical sense. While not 100% corresponding, they likely overlap considerably. Future steps include modelling within-individual processes to predict progression and outcome.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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