

LETTER TO THE EDITOR**When local poverty is more important than your income: mental health in minorities in inner cities**

In the next decades, the world's population in urban areas will increase by 2-3 billion people (1). Within this population context, there is increasing evidence that both socially disadvantaged inhabitants and people with a minority status are at high risk for mental disorders and mental health burden (2-4).

Differential analyses of individual-level and neighborhood-level socioeconomic factors in native citizens have suggested that the neighborhood context may impact mental health beyond individual differences in income and education (5). Recent data indicate that the processing of social stress is different in migrants in connection with urbanicity, raising the possibility of additive or interactive effects of these risk factors (6). We investigated the effects of individual differences in socioeconomic and minority status, as well as of poverty and ethnic composition at the level of urban neighborhoods, on mental health in an inner city population in Berlin, Germany.

Participants were selected from public registries comprising all residents in 11 neighborhoods within the central district of Berlin's inner city ("Berlin-Mitte") in combination with on-site selection and snowballing (see 7 for details). We focused on the largest minority in Berlin, i.e., people with a Turkish migration background (8). Respondents (N = 478) reflected the average age and gender distribution within each of the neighborhoods (8). Neighborhood variables derived from microcensus data included the age and gender distribution, the proportion of residents with minority status (ethnic density), and the proportion of residents on public welfare in local neighborhood communities.

Interviews were conducted in German and Turkish by trained interviewers and consisted of a socio-demographic assessment and the General Health Questionnaire 28-item version (GHQ-28) (9).

We used individual level variables (age, gender, years of education, monthly net income per household member, and minority status) and neighborhood-level variables (ethnic density and percentage of residents on public welfare within a neighborhood) to predict mental health status in a multilevel model using R System for Statistical Computing (www.cran.org). In addition, we specified a term for the interaction of the presence of a migration background with local poverty levels, which we added to the specified models.

On average, subjects with a minority status had significantly less years of education, less income, and higher levels of mental distress. On an individual level, increasing age ($\beta_i = 0.15$, $SE = 0.07$, $p < 0.05$), decreasing income ($\beta_i = -0.86$, $SE = 0.42$, $p < 0.05$), and minority status

($\beta_i = 3.58$, $SE = 1.78$, $p < 0.05$) were associated with an increase in mental distress. The most pronounced effect due to individual factors was associated with having a migration background, which led to an increase of more than 3.5 points on the GHQ-28. The age effect corresponded to an increase of roughly 1.5 points on the GHQ-28 per decade, and each 100 Euros lower monthly income led to an increase of roughly 1 point on the GHQ-28.

When assessing neighborhood effects, the percentage of citizens on public welfare at the neighborhood level accounted for the largest share in the variance in mental health ($\beta_n = 1.12$, $SE = 0.26$, $p < 0.001$), corresponding to roughly 11 points on the GHQ-28 for each 10% increase in the percentage of residents receiving public welfare benefits within the neighborhood. Crucially, we found a significant interaction between individual minority status and neighborhood level poverty at a more liberal threshold ($\beta_{i,n} = 0.50$, $SE = 0.30$, $p < 0.10$), indicating that a 10% increase in the percentage of residents on public welfare in the neighborhood corresponded to an increase of roughly 8 points on the GHQ-28 in the entire population, and an additional 5 points on the GHQ-28 in residents with minority status.

To the best of our knowledge, this is the first study showing that poverty in the neighborhood, as indexed by the proportion of residents in a local neighborhood on public welfare, explains significantly more variance in mental health among persons with versus without a migration background, beyond individual effects of age and income.

From a public health perspective, these findings may have implications for the prevention of mental health problems in inner city minority populations. One may well hypothesize that general economic measures and interventions aimed at alleviating poverty may, on a population level, have a significant impact on mental health. Likewise, interventions aimed at alleviating the mental health burden specific to residents with a minority status may have to take local poverty effects into account. At this level, policy makers, public health experts, and actors in community psychiatry and prevention may want to consider expanding service provision according to local economic factors.

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