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Accuracy of Case Managers in Estimating Intelligence Quotients and Functional Status of People Experiencing Homelessness

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Abstract

Adults who are homeless experience high rates of health conditions and psychological distress, including low IQ and functional status. Resources are available to help these individuals, but provision of support is often contingent upon the identification of a known disability. In this context, we examined case managers' (CMs') subjective estimates of IQ and functional status in 77 adult residents of an urban homeless shelter. Participants completed objective measures of IQ and functional capacity. CMs overestimated IQs of lower IQ (IQ < 90) participants, correctly estimated IQs of average IQ (IQ = 90 –110) participants, and underestimated IQs of higher IQ (IQ > 110) participants. CMs correctly identified 2 out of 8 participants meeting criteria for intellectual disability and 4 out of 16 participants with impaired functional status. These findings suggest that subjective evaluations of IQ and functional status are prone to a central tendency bias, leading CMs to overlook clients who are in need of assistance. Consequently, the objective measurement of IQ and functional status in homeless shelters is highly recommended.

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Keywords

intellectual disability (ID); intelligence testing; cognitive screening; poverty; socioeconomic status

On an average day in the United States in 2018, approximately 553,000 people were homeless (U.S. Department of Housing and Urban Development, 2018). Intellectual disability (ID) is overrepresented in homeless adults (Oakes & Davies, 2008), and it exacerbates their health problems (Van Straaten et al., 2014). Indeed, adults with low intellectual functioning experience elevated mortality rates (Tyrer, Smith, & McGrother, 2007), high levels of loneliness (McVilly, Stancliffe, Parmenter, & Burton-Smith, 2006), and low self-esteem (Paterson, McKenzie, & Lindsay, 2012). Fortunately, evidence-based interventions, social services, and entitlement benefits exist for adults with ID (Sullivan et al., 2018; Thompson et al., 2009); however, provision of services and benefits is contingent upon accurate identification of the disability. Typically, ID is diagnosed during childhood, when scholastic demands reveal intellectual deficits (Snell et al., 2009), but factors such as low family socioeconomic status and underresourced school systems may preclude detection of below-average academic performance, possibly leading to un-diagnosed adult ID and poverty/homelessness (Chapman, Scott, & Stanton-Chapman, 2008; Emerson, 2007). On the other hand, with appropriate identification, a diagnosis of ID (i.e., IQ < 70 or between 70 and 75 with accompanying adaptive deficits; American Psychiatric Association, 2013) confers eligibility for Supplemental Security Income, a federal entitlement providing basic income for people with disabilities.

For adults who are unaware of their intellectual functioning status or who have impaired intellectual functioning and have not undergone an IQ evaluation, health care providers can serve an important role by recognizing the need for assessment and making an appropriate referral. However, subjective IQ judgments are difficult, and research suggests that, although teachers' (Fischbach, Baudson, Preckel, Martin, & Brunner, 2013) and peers' (Kornilova, Kornilov, & Chumakova, 2009) IQ estimates correlate with individual educational attainment and objective IQ, there remains a bias toward overestimation, even in people who know each other well (e.g., romantic couples; Gignac & Zajenkowski, 2019). Overestimation of IQ in people who are homeless carries particularly high stakes; adults with ID may not receive appropriate support, thereby perpetuating a cycle of poverty, isolation, maltreatment, and homelessness (Nooe & Patterson, 2010). Consequently, it is important to identify biases in subjective judgments of IQs in people who are homeless, in order to modify assessment procedures to improve identification of ID and provision of support services, such as assistance with disability applications.

Given the clinical implications of subjective appraisals of ID in people experiencing homelessness, we investigated the ability of homeless shelter case managers (CMs) to estimate the IQs of their clients. We are aware of no other study reporting on CMs' subjective judgments of homeless clients' IQ scores. Specifically, we hypothesized that (a) CM-estimated IQ would correlate with objective IQ and supplemental cognitive/functional tests, but that (b) CMs would overestimate clients' IQs on average. Next, in exploratory analyses, we classified objective IQ as low (<90), average (90–110), or high (>110;

Wechsler, 2008) and examined CM estimates of IQ compared to objective IQ. Finally, given the centrality of adaptive deficits in people with low intellectual functioning, we examined the relationship between CM-estimated functional independence and objective functional independence. All data reported in the current study were part of a larger investigation of cognition in homeless adults (Vella, 2014).

Method

Participants and Procedures

Participants were 77 residents of a large homeless shelter (Father Joe's Villages [FJV] in San Diego, California) between February 2012 and March 2013 (see Table 1 for sample characteristics). Inclusion criteria were (a) English speaking, (b) aged 18 – 89 years, and (c) able to provide informed consent. Institutional review boards from FJV and University of California, San Diego approved all study procedures.

During the 14-month recruitment period, 626 consecutively admitted shelter residents were informed about the study by their CMs during their first appointment, 175 of 626 residents contacted study staff members expressing interest in participation, and 126 of 175 both (a) met study inclusion criteria and (b) responded to an initial phone call from a study staff member. Of the 126 residents who were eligible and scheduled for testing, 18 did not attend their session, 8 chose not to participate, and 23 did not have CM-estimated IQ data, leaving 77 participants (12.3% of the residents at FJV between February 2012 and March 2013) in the current sample.

CMs were educated at the bachelor's or master's level and differed in terms of clinical experience and skill, reflecting real-world variation. In order to assess CMs' initial impressions, they rated each client's IQ and ability to live independently following the first case management meeting. During this meeting, CMs interviewed clients about their medical, psychiatric, psychosocial, employment, and homeless histories in order to guide service provision. For the purposes of the current study, CMs received written definitions and quantitative values for conventional IQ categories (i.e., very superior [130–157], superior [120–129], high-average [110–119], average [90–109], low-average [80–89], borderline [70–79], intellectual disability [69]) and then subjectively estimated clients' IQs without knowledge of any objective assessment results. CMs also answered the following question: "Do you believe this client can live independently? (i.e., does not need a skilled nursing facility, assisted living, board and care facility, etc.)."

Immediately following informed consent, participants answered questions regarding recent alcohol and drug use, and then trained study staff administered the neuropsychological and functional battery. The entire evaluation took 60–90 min. After the assessment, participants received a $20 gift card to a local restaurant or coffee shop. Following participants' initial case manager visit, study staff members collected additional psychosocial and medical data, including psychiatric diagnoses.

Measures

The two-subtest Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler, 1999), including Vocabulary and Matrix Reasoning, provided an objective estimate of IQ. WASI IQ correlates strongly ($r = .87$) with Wechsler Adult Intelligence Scale–Third Edition Full Scale IQ (Strauss, Sherman, & Spreen, 2006). Participants also completed the Montreal Cognitive Assessment (MoCA) as a cognitive screening test (Nasreddine et al., 2005) and Coding from the Wechsler Adult Intelligence Scale–Fourth Edition as a measure of processing speed (Wechsler, 2008). Finally, they completed the UCSD Performance-Based Skills Assessment–Brief (UPSA-B) as an estimate of functional capacity (Mausbach, Harvey, Goldman, Jeste, & Patterson, 2006). The UPSA-B uses role-play scenarios to assess everyday functioning skills in two domains (finance and communication). An UPSA-B cutoff of 60 is associated with the ability to live independently in individuals with schizophrenia.

Statistical Analyses

We tested the first hypothesis with Pearson's correlations between CM-estimated IQ and (a) objective (WASI) IQ and (b) MoCA, Coding, and UPSA-B scores. We then conducted a paired samples t test on differences between CM-estimated IQ and WASI IQ to test the second hypothesis. For the exploratory analyses, we first stratified our sample into low (<90), average (90–110), and high (>110) WASI IQ scores and then conducted paired samples t tests on differences between CM-estimated IQ and WASI IQ. Second, we compared CMs' estimates of their clients' ability to live independently to an objective measure of independent living (UPSA-B, cutoff = 60) with a 2×2 Fisher's exact test (two cell frequencies were < 5; see Field, 2009).

Results

Of the 77 participants, CMs correctly estimated 31 IQs (within ± 5 points; 40.3%), overestimated 28 IQs (36.4%), and underestimated 18 IQs (23.4%). CM-estimated IQ correlated with WASI IQ ($r = .51$; $p < .001$), MoCA total score ($r = .52$; $p < .001$), Coding ($r = .40$; $p < .001$), and UPSA-B ($r = .49$; $p < .001$). On average, CMs' subjective IQ judgments ($M = 101.6$; $SD = 12.0$) overestimated WASI IQs ($M = 98.1$; $SD = 15.8$), $t(76) = 2.1$, $p = .04$, Cohen's $d = 0.24$.

In terms of the exploratory analyses, for participants with low IQs (<90; $n = 19/77$, 25%), CMs' subjective IQ judgments ($M = 95.8$; $SD = 15.7$) overestimated WASI IQs ($M = 76.4$; $SD = 11.3$), $t(18) = 6.9$, $p < .001$, Cohen's $d = 1.59$. For participants with high IQs, (>110; $n = 15/77$, 19%), CMs' subjective IQ judgments ($M = 106.6$; $SD = 8.7$) underestimated WASI IQs ($M = 117.3$; $SD = 6.5$), $t(14) = 4.0$, $p = .001$, Cohen's $d = 1.03$. For participants with average IQs (90 –109; $n = 43/77$, 56%), CMs' IQ estimates ($M = 102.3$; $SD = 10.4$) did not differ from WASI IQs ($M = 101.0$; $SD = 5.5$), $t(42) = 1.0$, $p = .33$. Eight participants had WASI IQs in the ID range (75), but only two of the eight were identified by their CMs as having IQs 75. Moreover, the relationship between CM-estimated ability to live independently and UPSA-B prediction was statistically significant, $\chi^2(1) = 6.185$, $p = .03$.

CMs correctly classified 95% (58/61) of those who scored 60 on the UPSA-B but correctly classified only 25% (4/16) of those who scored < 60 on the UPSA-B.

Discussion

Approximately one quarter of our sample earned WASI IQ scores below 90, which is consistent with prior work by Oakes and Davies (2008). CMs' IQ estimates correlated with objective two-subtest WASI IQ, but CMs overestimated clients' IQ and functional independence status on average, resulting in only 2 out of 8 participants with IQs in the ID range (75) and only 4 out of 16 participants with UPSA-B scores in the functionally impaired range (<60) being correctly identified. Moreover, CMs demonstrated a central tendency bias such that scores in the lower and upper IQ ranges in the sample were given IQ ratings closer to average. Importantly, the overestimation of IQ and lack of sensitivity to ID in homeless populations could prevent the provision of appropriate interventions and services, especially because homeless shelters may not regularly administer objective IQ tests.

Overall, results from the current study suggest that brief, objective IQ estimates such as the two-subtest WASI (~15 min for administration; Wechsler, 1999) be administered more commonly in homeless shelters, even when subjective impressions do not strongly suggest intellectual impairment. Specifically, we recommend that homeless shelters consider screening all incoming clients with the WASI-II or a similar validated IQ screening measure; those whose scores suggest borderline or impaired intellectual functioning would then be referred for a full intellectual and functional assessment, including performance validity tests to ensure the validity of test results in the context of potential secondary gain. In order to implement these procedures, shelters will require additional trained staff (to administer the tests), test materials, and time and space to perform the evaluations.

The study is limited in its small sample size and exclusion of non-English speakers. Sample bias also emerged as a concern, as only 28% of FJV clients informed of the study indicated interest, and even fewer participated. However, regarding generalizability, our sample was broadly representative of the larger homeless population in the United States in terms of age (mostly middle-aged adults), sex (predominantly male), and race (approximately 50% White and 50% non-White; U.S. Department of Housing and Urban Development, 2018). Our sample also approximated 2018 data on overall FJV enrollment in terms of sex (67% male in the larger FJV population [Father Joe's Villages, 2019]; 82% male in our sample). Unfortunately, no other demographic variables were available for this comparison. Finally, although CMs' IQ estimates were based on brief contact with clients (which could be considered a limitation), this may be a particularly ecologically valid approach, given the lack of resources and individual characteristics that may interfere with extended contact.

Overall, our results argue for the utility of brief objective evaluations of intellectual functioning in homeless clinics across the United States. To further this line of inquiry, we recommend that future research investigate the ability of intellectual screening instruments to impact real-world outcomes such as housing status and success rate of disability applications. Ultimately, such information could lead to a better understanding of risk

factors for poor psychosocial outcomes and better provision of services for people who are homeless.

Acknowledgments

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Public Policy Relevance Statement

Homelessness is associated with a myriad of health problems, including low intellectual functioning and difficulties with complex daily tasks. Case managers in homeless shelters are prone to overestimating the IQs and functional status of their clients with low objective IQ scores, including those in the intellectual disability range. In order to ensure the identification of low IQ and the ultimate provision of appropriate resources, brief, objective IQ estimates should be routinely administered in homeless shelters.

Table 1.

Participant Characteristics and Test Scores (n = 77)

Variable	Value
Participant characteristics, *M* (*SD*)	
Age	49.57 (8.23)
Education, years	11.90 (2.20)
Years homeless, most recent estimate	1.74 (3.41)
Participant characteristics, %	
Sex: male	81.8
Race/ethnicity	
White, non-Hispanic	54.5
Minority	45.5
Psychiatric diagnosis present	28.9
Subjective/objective tests, *M* (*SD*)	
CM-estimated IQ	101.55 (12.05)
WASI-IQ	98.09 (15.82)
MoCA, total score	23.12 (3.60)
WAIS-IV coding, scaled score	8.00 (2.82)
UPSA-B, total score	73.18 (13.84)

Note. WASI = Wechsler Abbreviated Scale of Intelligence; MoCA = Montreal Cognitive Assessment; WAIS-IV = Wechsler Adult Intelligence Scale–Fourth Edition; UPSA-B = UCSD Performance-Based Skills Assessment–Brief; CM = case manager.