

## Research Article

# Feasibility of Using the Omaha System for Assessment to Determine Optimal Living Situation for Persons with Severe and Persistent Mental Illness

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- Omaha System
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**Abstract**

**Background:** Severe and persistent mental illness (SPMI) causes personal and financial challenges for individuals, their families, and their communities. Effective, interoperable methods are needed to evaluate individuals with SPMI for successful independent living, to avoid relapse and hospitalization. The Omaha System provides a comprehensive method for assessment, evaluation, and data interoperability across community and inpatient settings that is amenable for use in electronic health records (EHRs).

**Objective:** To examine the feasibility of using the Omaha System in SPMI client assessment to inform decisions regarding the optimal living situation.

**Methods:** A comprehensive, holistic case analysis of a man with SPMI living in a large group home in an urban community included two client interviews, medical record review, and discussions with health care professionals regarding the client's health status. Data were recorded using the Omaha System. Analysis employed nonparametric statistics to compare Knowledge, Behavior, and Status ratings (1=lowest – 5=highest) across nine problems.

**Conclusions:** This case study data demonstrated feasibility of using the Omaha System for SPMI assessment to provide a foundation for decision making regarding housing or placement. Results of data analysis revealed a significant gap between client Knowledge (2.22), Behavior (3.11), and Status (3.67) ratings. This evidence supports the group home environment placement for this client, especially supportive interventions for medication compliance, activities of daily living, and relating to others in community. Further research is needed to evaluate routine use of the Omaha System in EHRs to assess individuals with SPMI, evaluate their needs, exchange data, and support care across settings.

**ABBREVIATIONS**

SPMI: Severe and Persistent Mental Illness; EHR: Electronic Health Record; PO: from the Latin "per OS" (by mouth); Mg: milligram; ml: milliliter; IM: Intramuscular; BID: from the Latin "Bis In Die" (twice a day); HS: from the Latin "Hourasomni" (hour of sleep); PRN: from the Latin "Pro Re Nata" (as needed); RN: Registered Nurse.

**INTRODUCTION**

Severe and persistent mental illness (SPMI) causes personal and financial challenges for individuals, their families, and the communities in which they live [1]. Prior to the 1960s individuals in the United States with SPMI were placed primarily in inpatient psychiatric units, largely removed from society [2]. Since that time, there has been a push toward reintegration of

these individuals into the community, or deinstitutionalization. Deinstitutionalization refers to the process of closure or downsizing of large psychiatric hospitals and the establishment of alternative services in the community [2].

Examples of alternative community services range from staff supported group homes to assertive community treatment teams for individuals with mental illness living independently in the community. The current decentralized mental health care system, in particular a shift from long term psychiatric-inpatient care to community integration, has generally benefited middle-class individuals with less severe disorders.<sup>3</sup> Individuals with SPMI who have the greatest need may fare the worst [1-5]. Deinstitutionalization may have, in part, contributed to an unintended consequence of increasing rates of victimization among those with SMPI, particularly those with schizophrenia, while residents of board-and-care facilities had greater use of outpatient mental health services and lower rates of psychiatric and medical hospitalization [4,5]. Challenges remain in determining least restrictive environments due to uniqueness of each client situation. Because there are mixed reports of the benefits of least restrictive environments and community integration for individuals with SPMI, new methods are needed to accurately assess an individual with SPMI and determine the living situation that will result in the greatest quality of life [6].

A structured assessment and comprehensive, holistic interface terminology commonly used in electronic health records (EHRs) in community settings is the Omaha System [7]. The feasibility of using the Omaha System has also been established in acute care settings for discharge planning, intervention description, and information exchange using continuity of care documents [8-17]. The Omaha System consists of three relational, reliable, and valid components designed to be used together: the Problem Classification Scheme for client assessment, the Intervention Scheme to aid in determining appropriate care plans and services, and the Problem Rating Scale for Outcomes which is a psychometrically sound measure of problem-specific Knowledge, Behavior, and Status (KBS) used to determine client change or evaluation. The Omaha System organizes complex information using a structured 42-item problem list and a review of systems approach that enables data aggregation and analysis.

Advances in EHR use, together with structured data capture, promise to provide effective, interoperable methods to evaluate individuals with SPMI for successful independent living, to avoid relapse and hospitalization [4,17-20]. The objective of this study was to examine the feasibility of using the Omaha System in SPMI client assessment to inform decisions regarding the optimal living situation.

## MATERIALS AND METHODS

This case study utilized the Omaha System to classify problems and severity of a client (fictitious initials T.C.) with SPMI. The study was designed in collaboration with a large group home in a metropolitan area. Institutional Review Board approval was obtained from the University of Minnesota, with special procedures to protect the client with SPMI including introduction of the study to the client by the experienced, long-term group home registered nurse, and a determination that the

client was at a stable level in the course of the disease. T.C.'s case was selected based on diagnosis, stability of functioning, and ability to understand informed consent. The group home name is confidential. The group home administrator provided written permission to conduct the study, with periodic reviews of the process and results. A research assistant (first author) conducted the interviews under the supervision of an experienced clinician (last author). The group home provided medication monitoring by a registered nurse, safe communal living space, and secure entry/exit for residents and their visitors. Doors to buildings are locked and all residents have keys. Residents are free to come and go as they wish, but paraprofessional personnel monitor their presence at meal and medication time. Cues for self-care are regular communal meals (optional), and apartment safety assessments.

T.C. was a male client in his mid-40s, diagnosed many years with schizophrenia, living in a large group home providing 24-hour staffing and medication monitoring. Group home staff selected the participant, explained the study and obtained permission for informed consent. The research assistant followed up with another explanation of the study, to ensure understanding. The research assistant left the informed consent materials with T.C. and returned one week later to answer further questions and retrieve the signed consent.

The research assistant received training in use of the Omaha System before beginning the research, with emphasis on classifying information by Problems and related signs and symptoms, and rating Problem-specific KBS on an ordinal scale of 1 (lowest) to 5 (highest). Knowledge is defined as what the client knows, Behavior is defined as what the client does, and Status is defined as the number and severity of the client's signs and symptoms or predicament [7].

The research assistant held 2 interviews with T.C., reviewed T.C.'s medical record, and discussed T.C.'s status with the group home nurse. The research assistant reviewed all data before selecting Omaha System problems and ratings for the case study. The applicable Omaha System problems were identified and KBS ratings were documented: Income, Neighborhood/workplace safety, Interpersonal relationship, Mental health, Abuse, Cognition, Nutrition, Physical activity, and Substance use (KBS rating provided in Table 1). The research assistant and researcher analyzed and interpreted the case study data. Standard non-parametric statistical methods were used to compare rating rank across dimension for the nine problems [21]. The entire team reviewed this analysis and reached consensus on problems, ratings, analysis, and study conclusions.

## RESULTS AND DISCUSSION

The case study was developed regarding a male client in his mid-40s, with a diagnosis of schizophrenia. T.C. also had a diagnosis of asymptomatic mitral valve prolapse. T.C.'s medications were Fluoxetine 20 mg. PO daily (mood), Risperdal Consta 50 mg/ml, 2 ml IM every 2 weeks (psychosis), Acetaminophen 350 mg PO BID PRN (pain), and Trazodone 50 mg tablet, 1-2 tablets PO at HS PRN (insomnia). T.C. had regular contact with his mother and father, who were both supportive. He was especially close to his mother, and they had lunch together weekly. Throughout

the interview, T.C. displayed a flat affect. T.C.'s behavior during the interview was cooperative, but at times withdrawn.

T.C. presented with oily hair and clean but somewhat unkempt clothing. His face was expressionless with flat affect. His posture was normal and gait was smooth and coordinated—no evidence of tardive dyskinesia. T.C. spoke at a moderate rate and tone much of the time, though sometimes the pacing of his speech accelerated or decelerated rapidly. T.C. had a history of delusions of persecution and of auditory hallucinations, and had experienced suspiciousness and excessive religiosity in his delusions or hallucinations. T.C. did not present with delusions or hallucinations during the study.

T.C.'s flow of thought was generally organized, but was tangential and indecisive at times. T.C. was oriented to time, place, and person. His long term, short term, and remote memory were intact. He was able to focus for up to 15 minutes at a time.

T.C. had some insight regarding his situation. He knew he had a mental illness, and that he was living at a group home for that reason. He knew he should take medicine, though his rationale for adherence was that he gets "confused" without it. T.C. did not admit to experiencing hallucinations. Additionally, T.C. was not willing to name his diagnosis.

T.C.'s insight regarding the degree of his illness was unrealistic. Though he was medication compliant and his symptoms were under control, he had a history of medication noncompliance prior to group home placement. He did not understand that his ability to be medication compliant depended on a supportive and supervised environment. T.C. did have three-day packing privileges for fluoxetine. When medication compliant, T.C. made good decisions regarding budgeting and personal time, but had poor judgment with matters concerning his hygiene and personal health. Though he had a history of aggressive behavior, this was not currently a concern, and had not been since he became medication compliant. While at this group home, T.C. was previously assessed as being able to live independently in an apartment with weekly RN supervision, and

was discharged accordingly. However, while living independently, T.C. became confused about taking his medication, relapsed, and required hospitalization. After his condition stabilized, T.C. was discharged back to the group home.

The case study with analysis is based on a comprehensive, holistic assessment of an individual with severe and persistent mental illness (SPMI) using the Omaha System. The KBS results show that on average, his Knowledge ratings were significantly lower than his Behavior and Status ratings. The problems of Income, Abuse, Interpersonal relationship, Cognition, Neighborhood/workplace safety, and Physical activity particularly reflect this pattern. The Mental health problem has a different pattern, with lower rating for both Knowledge and Status due to the severity of his symptoms. However, the mental health Behavior rating is higher, possibly due to the structured group home environment. This analysis should be replicated using Omaha System datasets that include individuals with SPMI in community and inpatient settings.

For the nine Omaha System problems assessed in this case study, the highest Knowledge score was 3 (basic) related to Income and Physical activity (Table 2). For all other problems Knowledge scores were 2 (minimal). Table 2 provides the ratings and rationale for all problems in the analysis. Overall Knowledge ratings obtained by averaging ratings for the nine problems were Knowledge=2.22, Behavior=3.11, and Status=3.67. Pair-wise comparison of Knowledge, Behavior, and Status Ratings for nine problems using Wilcoxon Signed Ranks Test showed significant differences between Knowledge and Behavior ratings ( $p=.033$ ) and Knowledge and Status ratings ( $p=.009$ ) (Table 3). These results may reflect the effect of living in a group home as well as the client's characteristics. These results also demonstrate the value of a structured, ontological approach to documenting a client assessment. Classifying problems and measuring Knowledge, Behavior, and Status for each problem reveals a multi-dimensional picture of the client's situation and his strengths and needs. Such data may be used for individual clients to tailor care and guide decision making about living environment.

**Table 1:** Definitions of Omaha System Knowledge, Behavior, and Status Ratings<sup>9 p. 377</sup>

Scale	1	2	3	4	5
Knowledge	No knowledge	Minimal knowledge	Basic knowledge	Adequate knowledge	Superior knowledge
Behavior	Not appropriate	Rarely appropriate	Inconsistently appropriate	Usually appropriate	Consistently appropriate
Status	Extreme signs/symptoms	Severe signs/symptoms	Moderate signs/symptoms	Minimal signs/symptoms	No signs/symptoms

**Table 2:** Case Study Knowledge, Behavior, and Status Ratings by Problem with Rationale.

Problem	Rating	Rationale
Knowledge		
Income	3	Basic understanding of source of income; receives governmental health insurance; basic knowledge of what a budget is and how to budget.
Neighborhood/workplace safety	2	Little knowledge of neighborhood hazards; poor knowledge of possible solutions; minimal knowledge of emergency preparedness
Interpersonal relationship	2	Difficulty understanding social cues; often unable to understand the difference between positive and negative communication; little knowledge of positive conflict resolution methods.
Mental health	2	Some knowledge of symptoms of his mental illness; poor knowledge of impact of illness symptoms on life; minimal understanding of positive coping skills.
Abuse	2	Little understanding of difference between healthy and abusive relationships; poor understanding of how to protect self.

Cognition	2	Minimal knowledge of cognitive deficit
Physical activity	3	Basic knowledge of reasons to participate in physical activity.
Nutrition	2	Minimal knowledge of negative effects of diet on health; poor understanding of dietary guidelines.
Substance use	2	Minimal knowledge of negative effects of substance abuse.
Average across problems	2.22	
Behavior		
Income	2	Does not attend a job, or seek employment; is not able to independently navigate financial paperwork; is able to budget a small sum of money for personal expenses and prioritize these expenses.
Neighborhood/workplace safety	3	Follows group home safety rules, but not all community regulations; has no plans in place for emergencies.
Interpersonal relationship	3	Forms few relationships; generally isolative but will engage if prompted; often misreads social cues; often walks away from or avoids tense situations.
Mental health	4	Med-compliant due to supportive environment of group home. Regularly accesses mental health care under supervision of group home staff.
Abuse	2	Has history of being taken advantage of by "friends," has difficulty saying no to people.
Cognition	3	Fluctuating acceptance of limits of cognition due to mental illness; inconsistently utilizes or seeks assistance for these limitations.
Physical activity	5	Engages in physical activity almost daily. Some of this activity is due to anxiety and agitation.
Nutrition	3	Rarely eats fruits or vegetables; rarely limits fats and sugar intake or portions; eats 2 meals a day, one at McDonald's.
Substance use	3	Smokes at least 1 pack per day; frequent exposure to second-hand smoke.
Average across problems	3.11	
Status		
Income	5	Expenses met on time, consistent source of income, and paid health care expenses due to governmental programs (medical insurance and supplemental income).
Neighborhood/workplace safety	3	The environment of group home safeguards resident against most hazards; however, client is at risk for hazards when he goes out into the community alone.
Interpersonal relationship	4	Shows no pattern of manipulating or controlling others when medicine compliant; has little conflict in relationships when medication compliant; avoidant of conflict.
Mental health	2	Symptoms of mental illness severe enough to warrant a 24-hour care setting; vacillating levels of anxiety, depression, agitation and psychosis.
Abuse	4	Is vulnerable, but no abuse due to protective and supervised environment at group home.
Cognition	4	Has supports in place due to structure and supervision of group home; moderately able to function in society when med-compliant.
Physical activity	5	Consistently exercises five times per week.
Nutrition	3	Underweight, though high fat and sugar diet, due to inadequate caloric intake and frequent pacing.
Substance use	3	Moderate health issues (cough and shortness of breath) due to smoking.
Average across problems	3.67	

**Table 3:** Pair-wise Comparison of Client's Knowledge, Behavior, and Status Ratings for Nine Problems using Wilcoxon Signed Ranks Test.

		Number	Mean Rank	Sum of Ranks
Status – Knowledge ( $p=.009$ )	Negative Ranks	0 <sup>a</sup>	.00	.00
	Positive Ranks	8 <sup>b</sup>	4.50	36.00
	Ties	1 <sup>c</sup>		
	Total	9		
Behavior – Knowledge ( $p=.033$ )	Negative Ranks	1 <sup>d</sup>	3.50	3.50
	Positive Ranks	7 <sup>e</sup>	4.64	32.50
	Ties	1 <sup>f</sup>		
	Total	9		
Status – Behavior ( $p=.276$ )	Negative Ranks	1 <sup>g</sup>	3.50	3.50
	Positive Ranks	4 <sup>h</sup>	2.88	11.50
	Ties	4 <sup>i</sup>		
	Total	9		

a. Status < Knowledge; b. Status > Knowledge; c. Status = Knowledge; d. Behavior < Knowledge; e. Behavior > Knowledge; f. Behavior = Knowledge; g. Status < Behavior; h. Status > Behavior; i. Status = Behavior

Recently, much emphasis has been placed on integrating individuals with mental health illnesses into the community to provide the least restrictive environment possible [2]. Based on T.C.'s high status ratings, clinicians may conclude that T.C. would be able to live more independently, and that the group home would not be the least restrictive environment for him. Personal interviews with the client might further reinforce this conclusion, as T.C. expressed hopes of living independently and holding down a job. In this case study, the gap between the client's Knowledge and Behavior ratings provides evidence that indicate T.C. would be unable to effectively use knowledge to motivate behavior and improve or maintain status. The data also suggest the value of including physical activity opportunities for this client to leverage his strengths and promote wellbeing. In addition, the case study provides an example of how structuring assessments can generate large datasets for program outcomes evaluation and healthcare quality research.

For example, T.C. had a high Status but low Knowledge and Behavior rating for the Interpersonal relationship problem. Though his relationships at the group home were marked by docility and conflict avoidance, this was not the case previous to his admission. Additionally, T.C. was vulnerable and at risk of being taken advantage of by others. T.C. had great difficulty saying "no" to people with whom he had previous positive interactions. Thus, T.C. could be easily manipulated, abused, or controlled if living in the community. The supervision of the group home ensured that he was protected from abuse by others, including other residents with manipulative tendencies. T.C. showed no pattern of manipulating or controlling others when medication compliant, however, he had a history of being verbally and physically aggressive when not adhering to his medication regimen. T.C. also had a history of denying his need for medications, and had never succeeded in remaining medication compliant when living independently. It is only in the group home setting that T.C. was able to be consistently medication compliant. When previously living in an unmonitored environment, he would stop taking his medications and became increasingly paranoid and aggressive, which negatively affected his relationships.

Limitations of the case study method include inability to determine causation and inability to generalize findings. Thus, it is not possible to determine beyond expert opinion of the researchers whether or not group homes would be better than independent living for some individuals with SPMI. However, this study demonstrates that using the Omaha System as tool to assess and evaluate clients with SPMI is feasible, may be incorporated in EHRs in hospital and community settings alike, and such data may yield important insights about individual clients to improve outcomes of placement and care. Thus, this study highlights the potential for promoting client dignity and wellbeing through the use of standardized assessments, data analysis, and exchange of critical healthcare data across settings. Further research is needed to examine Knowledge ratings of the SPMI population relative to Behavior and Status. For example, novel patterns in the data may suggest variations in overall Status relative to signs/symptoms, strengths, and environments which could have implications for services provided in various types of living situations for persons with SPMI.

## CONCLUSION

This case study demonstrated the feasibility of using the Omaha System as a measure to quantify a comprehensive assessment in order to determine the optimal living situation for a client with SPMI. Using this method, the assessment results showed minimal Knowledge and inconsistently appropriate Behavior, but relatively high Status while living in the group home. This gap between Knowledge and Status suggested that KBS ratings may be a useful measure for predicting the least restrictive placement to support optimal client functioning. Further research is needed to evaluate routine use of the Omaha System in EHRs to assess individuals with SPMI, evaluate their needs, exchange data, and support care across settings.

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