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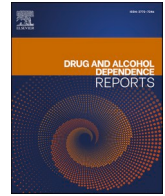
Emergency-department initiated buprenorphine: Impact on quality of life

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HIGHLIGHTS

- Medications for OUD (MOUD) have been demonstrated to improve quality of life in the outpatient setting.
- In light of the opioid epidemic, EDs have increasingly engaged in OUD treatment initiation.
- This project suggests that ED-initiated treatment for OUD can also positively impact QoL factors.
- ED patients with OUD face significant social risk and need.

ARTICLE INFO

ABSTRACT

Introduction: Emergency department (ED)-initiated medications for opioid use disorder (MOUD) have emerged as an acute care strategy against the opioid epidemic. When initiated in the outpatient setting, MOUD has been demonstrated to have a positive impact on patients' quality of life (QoL). It is unclear how engagement in ED-initiated MOUD, a novel initiation setting and unique patient cohort, might impact QoL. We sought to describe QoL variables reported by patients engaged in ED-initiated MOUD.
Methods: A retrospective observational study of an ED-initiated MOUD program was performed, inclusive of enrollments from July 2019 through February 2022. Participants were interviewed at intake, 3-months, and 6-months, during which QoL indices were measured via Government Performance and Results Act (GPRA) variables. Descriptive statistics and Pearson's Chi-Square analyses were utilized to assess the data.
Results: Of 315 participants, majority were white (78.4 %), male (64.4 %), between the ages of 25–44 (74.6 %), and heavily burdened by lack of insurance, homelessness, and unemployment. One hundred forty participants (44.4 % eligible) completed 3-month follow-up and 90 (28.5 %) completed 6-month follow-up. There were no significant demographic differences amongst respondents at 3- and 6-months as compared to intake. Objective QoL variables significantly improved at 3- and 6-months as compared to intake ($p < 0.01$). Subjective QoL variables also demonstrated significant improvement at follow-up ($p < 0.05$).
Conclusion: ED patients with OUD, eligible for MOUD, may face a number of social and interpersonal variables which heavily impact QoL. ED-initiated MOUD may positively impact subsequent QoL when measured over time.

1. Introduction

Escalating since the late 1990s, the opioid epidemic has dramatically impacted the lives of millions of Americans. The recent COVID-19 pandemic has further exacerbated this public health crisis, resulting in over 107,622 drug overdose deaths in 2021 (U.S. Department of Justice, 2022) the highest number of overdose deaths ever recorded in a 12-month period in the US, amounting to almost 300 deaths per day (Centers for Disease Control and Prevention, 2021). An overwhelming responsibility for responding to the opioid epidemic has increasingly fallen on hospital emergency departments (ED). In 2021, 15 % of drug-related ED visits were related to opioid misuse and recent

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prevalence assessments have demonstrated that opioids account for roughly 1 in every 80 ED visits in the US (Langabeer et al., 2021; Substance Abuse and Mental Health Services Administration, 2022a).

Considering patient volume and associated morbidity, acute care management of opioid use disorder (OUD) and opioid overdose represent a substantial current challenge for emergency clinicians (Weiner et al., 2020). Emergency department-initiated medications for opioid use disorder (MOUD), however, have emerged as an increasingly effective management and treatment strategy for OUD in the ED (D'Onofrio et al., 2015; National Institutes of Health, 2023). Patients with OUD engaged in ED-initiated MOUD programs have higher short-term (30-day) and long-term (6- and 12-month) subsequent treatment retention (Jennings et al., 2021; Reuter et al., 2022). MOUD initiation and use in non-ED settings has also been associated with overall improvement in health-related quality of life (QoL) factors (Connery, 2015; Jalali et al., 2020; Ling et al., 2020). According to the World Health Organization (WHO), quality of life is defined as "(an) individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns" (World Health Organization, 2012). Substance use disorders have been demonstrated to negatively impact QoL factors in affected individuals; this encompasses physical and mental health, societal and family functioning, including interpersonal relationships, employment, and residential status (Degenhardt et al., 2010; Singh et al., 2018). As such, QoL impact is being increasingly recognized as an important consideration in substance use research and clinical practice (Laudet, 2011).

While many studies examining the effects of MOUD initiated in non-ED settings have demonstrated positive correlative effects on QoL, it is unclear whether ED-initiated MOUD programs might have similar impact (Golan et al., 2022). As compared to traditional outpatient medical treatment venues, the ED represents a unique medical environment and patient population. Because the ED provides evaluation and treatment regardless of patients' social or financial background, the ED patient population is often disproportionately impacted by social risk and/or social need (Bitterman, 2006; Cone et al., 2003; Malecha et al., 2018; Terp et al., 2017). How these venue and population specific factors might impact or alter QoL outcomes associated with MOUD initiation, has not, to our knowledge, been previously described. As such, the objective of this study is to describe demographic characteristics and to assess QoL factors as reported by patients engaged in ED-initiated MOUD and referral services.

2. Methods

2.1. Study design

Supported by the Substance Abuse and Mental Health Services Administration (SAMHSA grant #H79TI081609), an ED-based MOUD-initiation program was launched at the University of Alabama at Birmingham (UAB) Hospital (> 75,000 annual patient ED visits) in July, 2019. The protocol has been previously extensively described; however, patients presenting to the ED with a primary complaint of non-fatal opioid overdose, opioid withdrawal, requesting opioid detoxification, or otherwise meeting Diagnostic and Statistical Manual of Mental Disorders (DSM-5) criteria for moderate to severe OUD, were deemed considerable for study inclusion, following medical stabilization and clearance (Walter et al., 2021). Emergency physicians engaged potential enrollees in a brief negotiated interview to confirm OUD diagnosis and to assess motivation to begin treatment for OUD. A subsequent physician-activated order in the electronic medical record notified research staff, 24/7, of a physician-confirmed eligible patient. Exclusion criteria included patients who were already actively engaged in a MOUD treatment program, medically or psychiatrically unstable patients, persons unable to consent, or otherwise considered to be part of a vulnerable population (e.g., pregnancy, incarcerated/in police custody).

Research staff conducted enrollment and assisted with linkage to follow-up care. Emergency physicians provided a 10-day prescription of buprenorphine/naloxone at time of enrolled patient discharge to bridge the patient pharmaceutically until follow-up appointment. As required by SAMHSA, Government Performance and Results Modernization Act (GPRA) assessments, comprehensive of extensive patient-specific information including demographics, substance use and misuse information, as well as mental health and physical health QoL variables, were collected by EM research staff at time of enrollment and by a community tracking service agency at 3- and 6-months post-enrollment (Substance Abuse and Mental Health Services Administration, 2019).

2.2. Assessment instrument

Designed to document and assess client-based outcome measures over time, the GPRA survey tool is a 44-page questionnaire used by SAMHSA to create a national picture of substance misuse and mental health services and to build evidence to support program outcomes associated with SAMHSA grants (Darby and Kinnevy, 2010). The GPRA tool specifically assesses ten National Outcome Measures (NOMs), which are standardized outcome measures identified, by SAMHSA (Substance Abuse and Mental Health Services Administration, 2022b). The NOM domains are meant to embody meaningful, real-life outcomes for people who are striving to attain and sustain recovery, build resilience, and work, learn, live, and participate fully in their communities. Aimed at the assessment and reassessment of NOMs, the GPRA tool evaluates employment/education, stability in housing, social connectedness and resilience amongst persons with substance use disorders specifically. The GPRA study instrument has been utilized previously to assess QoL domains in research cohorts (Ferdous, 2019). For this study, we elected to extrapolate QoL variables assessed via the GPRA assessment tool. Considering the prior definition of QoL presented by the WHO, we identified eleven GPRA-assessed QoL variables, including four objective factors (housing, education, employment, and financial needs) and seven psychosocial factors subjectively-rated and reported by the participants (satisfaction with personal relationships, family/friend support and contact, QoL self-rating, personal health satisfaction, energy for life, satisfaction with self, and violence exposure) which were assessed directly by the GPRA survey tool (Fig. 1).

2.3. Data analysis & consideration

In September 2022, retrospective analysis of study participants enrolled from July 2019, through February 2022, was performed. UAB Institutional Review Board approval was sought and obtained for this project. QoL variables with nominal response categories, including housing, education, and employment status, were categorized and grouped via allowable response options. Housing was grouped as either 'housed' (e.g., house, apartment, etc.) versus undomiciled (e.g., shelter, streets). Education was categorized as non-completion of high school, high school or high school equivalence completion, any prior college attendance, or completion of a bachelor's degree or higher. Employment was categorized as employed (full- or part-time) versus unemployed or disabled. QoL variables with Likert scale options were collated into either a binary response (e.g., yes or no, satisfied versus dissatisfied, good versus poor) or grouped into three subcategories (e.g., no/none versus little/moderate versus mostly/completely) for purpose of logical comparison.

Basic demographics, to include race and ethnicity, gender, age, and insurance status at time of enrollment, were also considered. Descriptive statistics and Pearson's chi-squared test were utilized to assess the data. All statistical analyses were performed using JMP Pro 14 (SAS Institute, Cary, NC) and all statistical tests were performed at $\alpha = 0.05$ significance level.

Objective QoL Factors:
• (**Housing**) In the past 30 days, where have you been living most of the time?
• (**Education**) What is the highest level of education you have finished (whether or not you received a degree)?
• (**Employment**) Are you currently employed?
• (**Financial Needs Met**) Have you enough money to meet your needs?
Psychosocial QoL Factors:
• (**Overall Health Self-Rating**) How satisfied are you with your health?
• (**Overall QoL Self-Rating**) How would you rate your quality of life?
• (**Energy Rating**) Do you have enough energy for everyday life?
• (**Self-Satisfaction**) How satisfied are you with yourself?
• (**Interpersonal Relationships**) How satisfied are you with your personal relationships?
• (**Family/Friend support**) In the past 30 days, did you have interaction with family and/or friends that are supportive of your recovery?
• (**Violence Exposure**) In the past 30 days, have you been hit, kicked, slapped, or otherwise physically hurt?

Fig. 1. Quality of life survey questions (GRPA Assessment Tool).

3. Results

Three hundred fifteen patients were enrolled in the study during the study timeframe. The majority were white (78.4 %), male (64.4 %), and between the ages of 25–44 (74.6 %) (Table 1). At intake, there were no significant bivariate differences between race and gender, gender and age, or race and age. Male gender was less likely to be publicly insured (10.9 % versus 23.4 %) and more likely to be uninsured (80.1 % versus 68.5 %) as compared to female subjects ($p < .05$); male and female subjects demonstrated similar proportions of privately insured. Black patients were more likely to have public insurance as compared to whites (24.6 % versus 13.3 % respectively) and were less likely to be privately insured as compared to whites (1.8 % versus 10.1 %; $p < .05$); a similar proportion of whites and Blacks were uninsured. Older cohorts were more likely to be publicly insured while younger cohorts were more likely to be uninsured; the 18 to 24-year-old cohort specifically was most likely to be privately insured ($p < .05$).

One hundred forty participants (44.4 %) completed a 3-month GPRA assessment and 90 (28.5 %) completed a 6-month GPRA assessment. There were no statistically significant differences with respect to gender, race, age or insurance status amongst follow-up respondents at 3- and 6-months, both timeframes as compared to intake.

With regard to objective QoL factors, significant improvements were reported in housing, employment, and financial needs at 3- and 6-months as compared to intake respectively (Table 2, Fig. 2). Compared to 21 % of participants who reported homelessness at intake, 7.8 % and 6.7 % of surveyed participants reported being undomiciled at 3- and 6-months, respectively ($p < .001$, $p < .005$). Of note, 43 (65.2 %) patients who reported homelessness at intake could not be reached at 3-months for follow-up assessment. This is compared to a 52.5 % 3-month drop-out rate for domiciled patients. While this trend is notable, it is technically not significant ($p = .07$). Of the 23 initially homeless participants who were able to be assessed at 3-months, 17 (73.9 %) reported being housed, with six remaining in a shelter or on the streets. An additional eleven (16.7 %) patients who identified as homeless at intake could not be reached at 6-months for follow-up assessment; however, seven (10.5 %) who identified as homeless at intake, who were not surveyed at 3-months, were able to be reached for 6-month assessment, four (57.1 %) of which reported being 'housed.' A total of 19 participants who reported homelessness at intake were included in the 6-month assessment (28.8 %) as compared to 71 (28.7 %) participants who initially reported being housed.

While 23.5 % of participants were employed at intake, 44.7 % and 50.0 % of survey participants reported being employed at 3- and 6-months, respectively, ($p < .001$). Financial needs mostly or completely met was reported by 35.5 % and 40.0 % of survey participants at 3- and 6-months, respectively, compared to 21.3 % at intake ($p < .005$, < 0.001). Considering the significant extreme objective survey responses, male subjects were more likely to report homelessness at intake as compared to female subjects (25.1 % versus 13.4 %; $p < .05$) (Table 3). Female participants and those uninsured or publicly insured were more likely to report unemployment/disability at intake ($p < .05$).

Table 1
General demographics at intake, 3-months, 6-months.

Demographic	Intake (n = 315)	3-month follow-up (n = 140; 44.4 %)	6-month follow-up (n = 90; 28.5 %)	p[a,b]
Race/ Ethnicity[^]				
White	247 (78.4 %)	108 (77.1 %)	71 (78.9 %)	0.464,
Black	57 (18.1 %)	30 (21.4 %)	17 (18.9 %)	0.905
Hispanic	3 (1.0 %)	1 (0.7 %)	1 (1.1 %)	
Native American	1 (0.3 %)	–	–	
Bi/multi-racial	1 (0.3 %)	–	–	
Gender				
Male	203 (64.4 %)	83 (59.3 %)	52 (57.8 %)	0.293,
Female	112 (35.6 %)	57 (40.7 %)	38 (42.2 %)	0.248
Age				
18–24	23 (7.3 %)	7 (5.0 %)	4 (4.4 %)	0.616,
25–34	105 (33.3 %)	53 (37.9 %)	34 (37.8 %)	0.636
35–44	130 (41.3 %)	50 (35.7 %)	33 (36.7 %)	
45–54	40 (12.7 %)	21 (15.0 %)	13 (14.4 %)	
55–64	13 (4.1 %)	7 (5.0 %)	5 (5.6 %)	
65+	4 (1.3 %)	2 (1.4 %)	1 (1.1 %)	
Insurance Status*[*]				
Uninsured	237 (75.2 %)	92 (65.7 %)	67 (74.4 %)	0.146,
Public	48 (15.2 %)	28 (20.0 %)	12 (13.3 %)	0.610
Private	25 (7.9 %)	16 (11.4 %)	10 (11.1 %)	

[a] Groups of ≤ 5 were excluded from statistical analyses.
[b] Intake comparison versus 3-month follow-up, Intake comparison versus 6-month follow-up.
[*] 2 'other,' 3 'don't know' at Intake; 1 'other, 3 'don't know' at 3-months; 1 'don't know' at 6-months.
[^] 1 'declined' at 3-months.

Table 2

Quality of life variable survey response, intake, 3-months, 6-months.

Objective Quality of Life Variable Time from Enrollment			*p*-value[i,j]
Housing[*]	**Undomiciled**	**Housed**	**<0.001, 0.002**
Intake (*n* = 315)	66 (21.0 %)	247 (78.4 %)	
3-month (*n* = 141)	11 (7.8 %)	130 (92.9 %)	
6-month (*n* = 90)	6 (6.7 %)	84 (93.3 %)	
Education[h]	**< HS/HS equiv**	**Some College Bachelors+**	0.133, 0.073
Intake (*n* = 315)	72 (22.9 %)	144 (45.7 %) 82 (26.0 %) 17 (5.4 %)	
3-month (*n* = 141)	21 (14.9 %)	61 (43.3 %) 46 (32.6 %) 11 (7.8 %)	
6-month (*n* = 90)	11 (12.2 %)	39 (43.3 %) 33 (36.7 %) 6 (6.7 %)	
Employment[^]	**Employed**	**Unemployed or Disabled**	**<0.001, <0.001**
Intake (*n* = 315)	74 (23.5 %)	229 (72.7 %)	
3-month (*n* = 141)	63 (44.7 %)	71 (50.4 %)	
6-month (*n* = 90)	45 (50.0 %)	44 (48.9 %)	
Financial Needs Met[a]	**No**	**A Little – Moderately** **Mostly - Completely**	**0.002, <0.001**
Intake (*n* = 315)	151 (47.9 %)	96 (30.5 %) 67 (21.3 %)	
3-month (*n* = 141)	52 (36.9 %)	33 (23.4 %) 50 (35.5 %)	
6-month (*n* = 90)	27 (30.0 %)	26 (28.9 %) 36 (40.0 %)	

Subjectively-reported Pyschosocial Quality of Life Factor Time from Enrollment			*p*-value[i,j]
Personal Relationship Satisfaction[b]	**Satisfied**	**Not Satisfied**	**<0.001, <0.001**
Intake (*n* = 315)	152 (48.3 %)	105 (33.3 %)	
3-month (*n* = 140)	103 (73.5 %)	17 (12.1 %)	
6-month (*n* = 90)	73 (81.1 %)	8 (8.9 %)	
Family/Friend Support/ Contact[c]	**Yes**	**No**	**0.002, 0.002**
Intake (*n* = 315)	230 (73.0 %)	83 (26.3 %)	
3-month (*n* = 140)	120 (85.7 %)	18 (12.9 %)	
6-month (*n* = 90)	80 (88.9 %)	10 (11.1 %)	
QoL Self-Rating[a]	**Very Good – Good**	**Poor-Very Poor**	**0.022, -**
Intake (*n* = 315)	104 (33.0 %)	35 (38.1 %)	
3-month (*n* = 140)	91 (65.0 %)	14 (10.0 %)	
6-month (*n* = 90)	61 (67.8 %)	3 (3.3 %)	
Satisfaction with Personal Health[f]	**Satisfied**	**Dissatisfied**	**<0.001, <0.001**
Intake (*n* = 315)	103 (32.7 %)	147 (46.7) %	
3-month (*n* = 140)	90 (64.3 %)	19 (13.6 %)	
6-month (*n* = 90)	55 (61.1 %)	13 (14.4 %)	
Energy for Life[g]	**None**	**A Little – Moderately** **Mostly – Completely**	**<0.001, <0.001**
Intake (*n* = 315)	103 (32.7 %)	112 (38.7 %) 90 (28.6 %)	
3-month (*n* = 140)	15 (10.7 %)	37 (26.4 %) 86 (61.4 %)	
6-month (*n* = 90)	10 (11.1 %)	28 (31.1 %) 52 (57.8 %)	
Satisfaction with Self[e]	**Satisfied**	**Dissatisfied**	**<0.001, <0.001**
Intake (*n* = 315)	72 (22.9 %)	186 (59.0 %)	
3-month (*n* = 140)	89 (63.6 %)	17 (12.1 %)	
6-month (*n* = 90)	61 (67.8 %)	12 (13.3 %)	
Violence Exposure[d]	**Yes**	**No**	**0.016, -**
Intake (*n* = 315)	42 (13.3 %)	265 (84.1 %)	
3-month (*n* = 140)	8 (5.7 %)	129 (92.1 %)	
6-month (*n* = 90)	2 (2.2 %)	88 (97.8 %)	

HS = high school; equiv = equivalent; QoL = quality of life.

[*] one 'refused,' one 'don't know'.

[^] two 'retired,' one 'don't know,' nine 'other' at Intake; four 'other,' one 'refused,' two retired at 3-months; one 'missing' at 6-months.

[a] one 'don't know' at Intake, two refused at 3-months; one 'don't know' at 6-months.

[b] one 'refused,' four 'don't know'.

[c] one 'don't know,' one 'refused' at Intake; two 'refused' at 3-months.

[d] one 'don't know,' one 'refused' at Intake; two 'refused' at 3-months.

[e] three 'don't know,' five 'refused' at Intake; one 'don't know,' two refused at 3-months.

[f] one 'don't know,' three 'refused'.

[g] two 'refused' at 3-months.

[h] two 'refused' at 3-months; one 'missing' at 6-months.

[i] Groups of ≤ 5 were excluded from statistical analyses.

[j] Intake comparison versus 3-month follow-up, Intake comparison versus 6-month follow-up.

This gender-specific difference persisted with 67.2 % of female respondents reporting unemployment/disability as compared to 38.6 % of male respondents at 3-month follow-up ($p < .001$); this trend remained at 6-months but was no longer statistically significant. Participants who were uninsured were most likely to report that their financial needs were unmet at intake ($p < .05$). Female respondents were more likely than male counterparts to report that financial needs were not met at 3-months ($p < .05$) and again, while this gender-specific trend persisted at 6-momths, it was no longer statistically significant.

All subjectively-reported psychosocial QoL variables demonstrated significant improvement at 3- and 6-month follow-up assessment (Table 2). Satisfaction with personal relationships increased at 3- and 6-months as compared to intake (48.3 % intake versus 73.5 % 3-month versus 81.1 % 6-month, $p < .001$). Family/friend support/contact increased from 73.0 % at intake to 85.7 % and 88.9 % at 3- and 6-months respectively ($p < .05$). Only 10.5 % and 11.1 % reported having no energy for everyday life at 3- and 6-months respectively, compared to 32.7 % at intake ($p < .001$). 'Very Good' and 'Good' QoL self-ratings increased from 33.0 % at intake to 65.0 % at 3-months and 67.8 % at 6-months ($p < .05$). Reported satisfaction with personal health at 3- and 6- months were 64.3 % and 61.1 % respectively compared to 32.7 % at intake ($p < .001$) and reported satisfaction with self at 3- and 6-months were 63.6 % and 67.8 % respectively compared to 22.9 % at intake ($p < .001$). Reported violence exposure also decreased to 5.7 % and 2.2 % at 3- and 6-months respectively, compared to 13.3 % at intake (< 0.05). When considering demographic-specific responses to psychosocial QoL variables, race and gender differences were noted at intake (Table 4). White participants were more likely to rate their QoL as poor or very poor (41.3 % versus 22.8 %; $p < .01$) and were more likely to report dissatisfaction with self (63.2 % versus 43.9 %; $p < .01$) as compared to Black participants; however, these self-rating differences resolved at 3- and 6-month follow-ups. Conversely, Black respondents were more likely to report that they had no family or friend supportive contact at 3-months as compared to white counterparts (23.3 % versus 8.3 %; $p < 0.05$). Female participants were more likely to report no energy for everyday life at intake compared to males (43.8 % versus 26.6 %; $p < 0.01$); this trend persisted at 3- and 6-months. Female participants were also more likely than males to report exposure to violence at intake (20.5 % versus 9.4 %; $p < .01$); this trend also persisted at 3- and 6-months. Finally, female participants were also more likely to report dissatisfaction with personal health; this trend was noted at each assessment point and noted to be significant at 3-months specifically (22.4 % females versus 7.2 % males; $p < .01$).

4. Discussion

This study redemonstrates the capacity of the ED to engage in OUD treatment initiation and referral. It also heavily underscores the disproportionate social risk and social need which impact individuals with OUD, particularly those seen in an ED setting. Extreme rates of socioeconomic disparity, including homelessness, unemployment, and financial insecurity, were noted in this study cohort at intake. A previous cross-sectional study considering zip-code level socioeconomic factors (poverty, unemployment, educational attainment, and income) in 17 states across the US, showed elevated rates of opioid overdose in economically disadvantaged zip codes (Pear et al., 2019). In Yamamoto et al. (2019)., considered homelessness as a factor in ED patients specifically, and demonstrated a significant association between opioid overdose and opioid-related ED visits and homelessness, even when
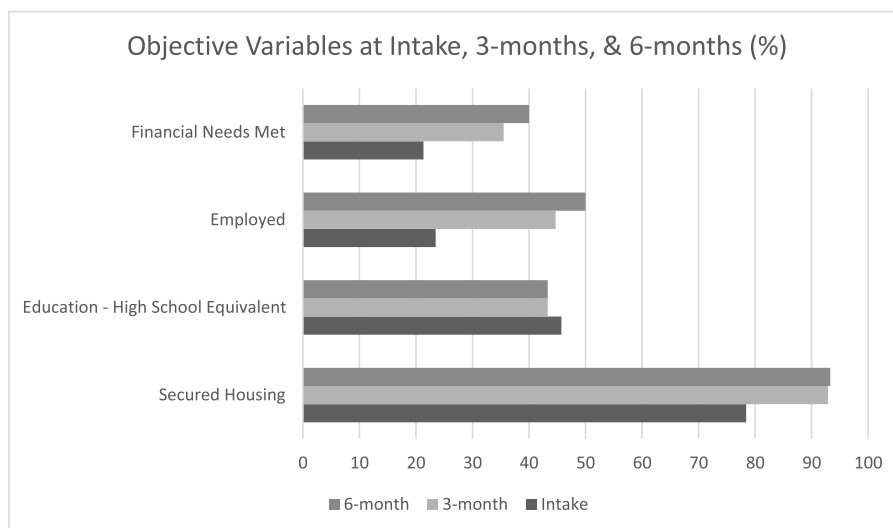
Fig. 2. QoL variables over time.

controlling for low income. These inequities may be attributed to upstream social disadvantages, including restricted economic opportunities and limited access to primary or preventive healthcare. The resultant environment has been shown to foster drug use, including the abuse of opioids (Galea et al., 2003). It also follows that the associated life stressors and despair associated with this environmental context results in depressed subjectively-reported psychosocial QoL variables (i. e., interpersonal relationships, self-rating of QoL, etc.), as was noted in a large proportion our study participants at intake.

However, engagement in this study, in ED-initiated MOUD treatment and follow-up referral, did result in a subsequent significant improvement for the majority of QoL factors assessed. Of note, while ED-initiated MOUD was a common variable among participants, post-ED visit OUD treatment and/or recovery courses were not standardized. While demonstration of motivation to change and a desire to engage in treatment for OUD was a requirement for enrollment, it can be presumed that each participant had a potentially unique post-ED experience as it pertains to their OUD. Considering this context and study response rates, for respondents, almost all subjective and objective factors were reported to be significantly improved from intake to 3- and 6-month follow-ups, respectively, with the exception of education status. A lack of significant improvement in education status may be expected given the months or years of time typically required to achieve categorical educational advancement. Of note, the relative dramatic improvement in psychosocial factors may be, in part, due to the fact that social relationship and psychological variables lend themselves to a more dynamic and rapid response than the assessed objective variables. Patients engaged in routine health care for chronic disease management, to encompass OUD, have been previously demonstrated to report improved overall wellness and health perceptions, even after only short time periods in treatment (Bombard et al., 2018). Similar rapid improvements in social relationship and psychological domains with MOUD treatment have been demonstrated in the outpatient-initiation setting previously (Dhawan and Chopra, 2013).

The gender and race-specific differences and trends noted at intake and over the course of the follow-ups may demonstrate the effect of sociocultural norms and culture on particular subgroups of persons with OUD. Subjectively, female participants increased reporting of lack of energy for life may reflect relative gender imbalance with regards to traditional gender roles and their impact on individuals with OUD specifically. Stereotypically, women are more likely to be caretakers, shouldering an increased number of home and family responsibilities as compared to men (Adelman et al., 2014; Goetz et al., 2021). This relative burden, accompanied by financial strain, (female participants were less

likely to be employed or have financial needs met) may result in a sense of depression or 'no energy for life.' While historically, men have accounted for the majority of illicit drug use and opioid overdoses, the past decade in particular has seen women increasingly impacted. Gender-specific differences in OUD, as well as OUD treatment outcomes, have been demonstrated previously and deserve continued focus and consideration (Walter et al., 2022). Violence exposure was another subjectively-reported category with disproportionate representation of female participants. The association between interpersonal violence (IPV) or violence and opioid misuse is well established (Williams et al., 2021). A 2019 systematic review conducted by Stone & Rothman found that the prevalence of IPV victimization among women who had used opioids was 36–94 % in their lifetimes, and 32–75 % in the past year; while also affected, the characterization of violence in the setting of opioid misuse in men is often different (IPV perpetration) than that for women and the prevalence has been shown to be less frequent (Stone and Rothman, 2019).

5. Limitations

While catering to an acute care population significantly impacted locally by the opioid epidemic, this study was limited to a single site and as such, results may not be universally applicable. In addition, follow-up survey capture demonstrated lost to follow-up rates of 55.2 % at 3-months and an additional 16.2 % at 6-months, conferring a potential survivorship bias. Prior ED-based OUD interventions have reported similar follow-up rates (Kilaru et al., 2020; Liebshutz et al., 2014). The socioeconomic factors detailed in the discussion above, in addition to the complexities of opioid misuse and reuse, make follow-up and compliance with care an ongoing challenge for this patient population. Finally, we elected to extrapolate QoL data collected from the GPRA tool, which was a required component of this funded project. Rather than incorporate a separate QoL assessment scale, which might further tax and dissuade eligible participants from engaging, we chose to adapt information which had already been obtained as a form of initial inquiry and needs assessment. Outcomes from this study suggest that future dedicated QoL-focused assessments should be considered and administered in this cohort, and compared directly to the GPRA tool for validation purposes.

6. Conclusion

The ED OUD cohort represents a unique patient population at particular social risk and often with extensive social need. Despite these

Table 3
Extreme objective QoL variables by demographic, intake, 3-months, 6-months.

Extreme Objective QoL Variable by Demographic	Intake n (%)	3-months n (%)	6-months n (%)
Housing – _Shelter or Streets_	7 (12.3)	2 (6.7)	2 (11.7)
Race – Black	56 (22.7)	9 (8.3)	4 (5.6)
White	**51 (25.1)**ˇ	5 (6.0)	4 (7.7)
Gender – Male	**15 (13.4)**	6 (10.3)	2 (5.3)
Female	55 (23.2)	10 (10.9)	4 (6.0)
Insurance – Uninsured	9 (18.8)	0 (0)	2 (16.7)
Public	2 (7.4)	1 (5.9)	0 (0)
Private	1 (4.4)	0 (0)	0 (0)
Age – 18–24	20 (19.0)	5 (9.4)	1 (2.9)
25–34	34 (26.2)	4 (7.8)	3 (9.1)
35–44	9 (22.5)	2 (9.5)	1 (7.7)
45–54	2 (15.4)	0 (0)	1 (20.0)
55–64	0 (0)	0 (0)	0 (0)
65+			
Employment Status – _Unemployed/Disabled_	42 (73.7)	18 (60.0)	8 (47.1)
	178	54 (49.5)	36
Race – Black	(72.1)	**32 (38.6)**ˇ	(51.4)
White	138	**39 (67.2)**	21
Gender – Male	(68.0)	*	(41.2)
Female	**91 (81.3)**ˇ	45 (48.9)	23
Insurance – Uninsured	176	19 (65.5)	(60.5)
Public	(74.3)	6 (35.3)	33
Private	**38 (79.2)**	2 (28.6)	(50.0)
Age – 18–24	**13 (48.1)**ˇ	29 (54.7)	8 (66.7)
25–34	16 (69.6)	23 (45.1)	3 (30.0)
35–44	72 (68.6)	11 (52.4)	0 (0)
45–54	101	6 (85.7)	19
55–64	(77.7)	0 (0)	(55.9)
65+	31 (77.5)		14
	7 (53.8)		(43.8)
	1 (25.0)		6 (46.2)
			4 (80.0)
			1 (100)
Financial Needs Met – _No_	22 (38.6)	9 (30.0)	6 (35.3)
Race – Black	123	43 (39.4)	21
White	(49.8)	**24 (28.9)**ˇ	(29.6)
Gender – Male	99 (48.8)	**28 (48.3)**ˇ	14
Female	52 (46.4)	35 (38.0)	(26.9)
Insurance – Uninsured	123	11 (37.9)	13
Public	(51.9)	6 (35.3)	(34.2)
Private	**16 (33.3)**ˇ	1 (14.3)	23
Age – 18–24	**11 (40.7)**ˇ	23 (43.4)	(34.3)
25–34	11 (47.8)	19 (37.3)	4 (33.3)
35–44	43 (41.0)	7 (33.3)	0 (0)
45–54	69 (53.1)	2 (28.6)	1 (25.0)
55–64	23 (57.5)	0 (0)	11
65+	4 (30.8)		(32.4)
	1 (25.0)		9 (27.3)
			4 (30.8)
			2 (40.0)
			0 (0)

* indicates $p < .001$.

ˇ indicates $p < .05$.

Table 4
Extreme Subjective QoL Variables by Demographic, Intake, 3-months, 6-months.

Extreme Subjective QoL Variable by Demographic	Intake n (%)	3-months n (%)	6-months n (%)
Personal Relationship Satisfaction – _Not Satisfied_	14 (24.6)	4 (13.3)	3 (17.6)
	87 (35.2)	12 (11.1)	5 (7.0)
Race – Black	71 (35.0)	9 (10.8)	4 (7.7)
White	34 (30.4)	8 (14.0)	4 (10.5)
Gender – Male	80 (33.8)	14 (15.2)	7 (10.4)
Female	16 (33.3)	2 (7.1)	0 (0)
Insurance – Uninsured	9 (33.3)	1 (5.9)	1 (10.0)
Public	10 (43.5)	1 (14.3)	1 (25.0)
Private	33 (31.4)	6 (11.3)	2 (5.9)
Age – 18–24	42 (32.3)	7 (14.0)	3 (9.1)
25–34	14 (35.0)	3 (14.3)	1 (7.7)
35–44	4 (30.7)	0 (0)	1 (20.0)
45–54	2 (50.0)	0 (0)	0 (0)
55–64			
65+			
Family/Friend Support/Contact - _No_	10 (17.5)	**7 (23.3)**^	3 (17.6)
Race – Black	68 (27.5)	9 (8.3)	7 (9.9)
White	54 (26.6)	11 (13.3)	8 (15.4)
Gender – Male	29 (25.9)	7 (12.1)	2 (5.3)
Female	61 (25.7)	11 (12.0)	8 (11.9)
Insurance – Uninsured	17 (35.4)	6 (20.7)	1 (8.3)
Public	5 (18.5)	1 (5.9)	1 (10.0)
Private	5 (21.7)	0 (0)	0 (0)
Age – 18–24	26 (24.8)	7 (13.2)	3 (8.8)
25–34	32 (24.6)	4 (7.8)	6 (18.2)
35–44	12 (30.0)	4 (19.0)	1 (7.7)
45–54	6 (46.2)	1 (14.3)	0 (0)
55–64	2 (50.0)	2 (100.0)	0 (0)
65+			
QoL Self-Rating – _Poor to Very Poor_	**13 (22.8)**	3 (10.0)	2 (11.8)
Race – Black	**102 (41.3)**	11 (10.1)	1 (1.4)
White	*	4 (4.8)	1 (1.9)
Gender – Male	77 (37.9)	10 (17.2)	2 (5.3)
Female	43 (38.4)	11 (12.0)	1 (1.5)
Insurance – Uninsured	96 (40.5)	3 (10.3)	2 (16.7)
Public	16 (33.3)	0 (0)	0 (0)
Private	8 (29.6)	1 (14.3)	0 (0)
Age – 18–24	8 (34.8)	3 (5.7)	2 (5.9)
25–34	39 (37.1)	5 (9.8)	1 (3.0)
35–44	50 (38.5)	5 (23.8)	0 (0)
45–54	19 (47.5)	0 (0)	0 (0)
55–64	3 (23.1)	0 (0)	0 (0)
65+	1 (25.0)		
Satisfaction with Personal Health – _Dissatisfied_	21 (36.8)	4 (13.3)	4 (23.5)
	121 (49.0)	15 (13.8)	9 (12.7)
Race – Black	87 (42.9)	**6 (7.2)***	5 (9.6)
White	60 (53.6)	13	8 (21.1)
Gender – Male	110 (46.4)	**(22.4)**	10
Female	20 (41.7)	16 (17.4)	(14.9)
Insurance – Uninsured	14 (51.9)	3 (10.3)	2 (16.7)
Public	16 (69.6)	0 (0)	1 (10.0)
Private	49 (46.7)	1 (14.3)	0 (0)
Age – 18–24	61 (46.9)	6 (11.3)	5 (14.7)
25–34	15 (37.5)	7 (13.7)	6 (18.2)
35–44	6 (46.2)	4 (19.0)	2 (15.4)
45–54	1 (25.0)	1 (14.3)	0 (0)
55–64		0 (0)	0 (0)
65+			
Energy for life – _None_	19 (33.3)	1 (3.3)	2 (11.8)
Race – Black	79 (32.0)	2 (1.8)	8 (11.3)
White	**54 (26.6)**	4 (4.8)	3 (5.8)
Gender – Male	**49 (43.8)***	11 (19.0)	7 (18.4)
Female	80 (33.8)	13 (14.1)	6 (9.0)
Insurance – Uninsured	18 (37.5)	2 (6.9)	2 (16.7)
Public	5 (18.5)	0 (0)	2 (20.0)
Private	7 (30.4)	1 (14.3)	1 (25.0)
Age – 18–24	35 (33.3)	2 (3.8)	3 (8.8)
25–34	45 (34.6)	6 (11.8)	4 (12.1)
35–44	12 (30.0)	5 (23.8)	2 (15.4)
45–54	3 (23.1)	1 (14.3)	0 (0)
55–64	1 (25.0)	0 (0)	0 (0)
65+			

initial impediments, as has been demonstrated with QoL outcomes in traditional outpatient and addiction treatment clinic settings, with an engaged patient cohort, ED-initiated MOUD can improve QoL variables, both objective and subjective. Further studies should be conducted to validate the QoL influence from the ED perspective with particular focus on more long-term impact. In addition, while an integral starting block, ED-MOUD initiation alone is likely not the only variable which impacted outcomes. Future research which delineates specific post-ED treatment and recovery courses, and considers the impact of social variables, should be considered.

Prior presentation

This work was presented in oral abstract format at the Society for Academic Emergency Medicine (SAEM) Annual Meeting 2023, Austin, Texas.

Table 4 (*continued*)

Extreme Subjective QoL Variable by Demographic	Intake n (%)	3-months n (%)	6-months n (%)
Satisfaction with Self – *Dissatisfied*	**25 (43.9)**	2 (6.7)	2 (11.8)
Race – Black	**156 (63.2)**	15 (13.8)	10
White	*	8 (9.6)	(14.1)
Gender – Male	70 (62.5)	9 (15.5)	6 (11.5)
Female	116 (57.1)	13 (14.1)	6 (20)
Insurance – Uninsured	140 (59.1)	3 (10.3)	10
Public	27 (56.3)	1 (5.9)	(14.9)
Private	17 (63.0)	0 (0)	0 (0)
Age – 18–24	18 (78.3)	3 (5.7)	2 (20.0)
25–34	59 (56.2)	8 (15.7)	0 (0)
35–44	76 (58.5)	4 (19.0)	4 (11.8)
45–54	23 (57.5)	1 (14.3)	6 (18.2)
55–64	8 (61.5)	1 (50.0)	2 (15.4)
65+	2 (50.0)		0 (0)
			0 (0)
Violence Exposure – *Yes*	5 (8.8)	0 (0)	1 (5.9)
Race – Black	35 (14.2)	8 (7.4)	1 (1.4)
White	**19 (9.4)**	2 (2.4)	1 (1.9)
Gender – Male	**23 (20.5)***	6 (10.3)	1 (2.6)
Female	34 14.3)	6 (6.6)	2 (3.0)
Insurance – Uninsured	7 (14.6)	0 (0)	0 (0)
Public	1 (3.7)	2 (6.9)	0 (0)
Private	3 (13.0)	1 (14.3)	0 (0)
Age – 18–24	16 (15.2)	2 (3.8)	1 (2.9)
25–34	18 (13.8)	4 (7.8)	0 (0)
35–44	3 (7.5)	1 (5.0)	1 (7.7)
45–54	2 (15.4)	0 (0)	0 (0)
55–64	0 (0)	0 (0)	0 (0)
65+			

* indicates $p < .01$, ˆindicates $p < .05$
Categories and groups with < 5 excluded from statistical analysis.

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Study has been approved by University of Alabama at Birmingham Institutional Review Board. Verbal and Written consent was obtained by study participants.

Consent for publication

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Availability of data and materials

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CC – Drafting of Manuscript. DH – Acquisition of Data, Analysis and Interpretation of Data. JR – Critical Revision of the Manuscript for Important Intellectual Content. WC – Acquisition of Data, Analysis and Interpretation of Data. JH – Acquisition of Data. LL – Review and Editing. LW – Study Concept and Design, Statistical Expertise, Acquisition of Funding.

Declaration of Competing Interest

CC reports no conflict of interest.
DH reports no conflict of interest.
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LW reports no conflict of interest.

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