Emergency-Department Initiated Buprenorphine: Impact on Quality of Life Factors

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Abstract

Background: Emergency department (ED)-initiated medications for opioid use disorder (MOUD) have emerged as an effective strategy against the opioid epidemic. Opioid use disorder (OUD) patients engaged in ED-initiated MOUD programs have higher retention in treatment programs and improved outcomes with regard to overdose rates and mortality. It is unclear however, how engagement in ED-initiated MOUD programs might affect quality of life (QoL). We sought to describe demographic characteristics and QoL factors reported by patients engaged in ED-initiated MOUD and referral services.

Methods: An ED MOUD-initiation program was launched in July 2019, with subsequent referral to definitive services. Enrolled patients were interviewed at intake, 3-months, and 6-months to ascertain QoL indices via the Government Performance and Results Act (GPRA) measures. Descriptive statistics and Fisher's Exact were utilized to assess the data.

Results: Through 12/2020, 89 participants were enrolled. The majority were white (85.4%), male (61.8%), and between the ages of 25-44 (75.3%). To-date, 31 participants (43.7% eligible) have completed 3-month follow-up and 28 (45.2% eligible) have completed 6-month follow-up. With regards to assessed QoL factors, over half demonstrated significant improvement, including 5 of 7 psychosocial factors, to include satisfaction with personal relationships, QoL self-rating, satisfaction with personal health, energy for everyday life, and satisfaction with self ($p < .05$). Financial needs met was the only objective QoL factor to demonstrate significant improvement during the follow-up time period. While not significant, homelessness also decreased, specifically 14 (15.7%) identified as homeless at intake as compared to one (3.7%) at 6-month follow-up. Additional trends toward decreased violence exposure and increased employment rates were also noted.

Conclusions: In addition to decreasing illicit opioid drug use, maintenance of ED-initiated MOUD may positively impact broad QoL measures.

Background:

In the past two decades, the opioid epidemic has dramatically impacted the lives of millions of Americans and likewise, has had significant effect on United States (US) Emergency Departments (EDs). Since 1999, approximately half a million individuals have died from a drug overdose involving a prescription or illicit opioid, and ED visits for opioid-related incidences continue to rise.^{1,2} One in 20 patients discharged from an ED following a nonfatal opioid overdose are deceased within one year, most often from a subsequent opioid overdose.³ The recent COVID-19 pandemic has further exacerbated this public health crisis, resulting in over 81,000 drug overdose deaths within a 12-month period (June 2019 – May 2020), the highest number of overdose deaths ever recorded in a 12-month period in the US.⁴

Acute care management of opioid misuse and opioid use disorder (OUD) represents one of the most substantial challenges faced by emergency physicians today. Emergency department-initiated medications for opioid use disorder (MOUD), however, have emerged as an effective management and

treatment strategy for OUD.⁵ Opioid use disorder patients engaged in ED-initiated MOUD programs for at least one year have higher retention in treatment programs and improved outcomes with regard to overdose rates.³ In addition to a profound impact on patient mortality, MOUD use for OUD has also been associated with overall improvement in health-related quality of life (QoL) factors.^{6,7,8} 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.’”⁹ 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.^{5,10, 11} Quality of life impact is being increasingly recognized as an important consideration in substance use research and clinical practice.¹²

While many studies examining the effects of MOUD initiated in the addiction treatment setting have demonstrated positive correlative effects on QoL, it is unclear whether ED-initiated MOUD might have similar impact. The objective of this study is to describe demographic characteristics and to assess quality of life (QoL) factors as reported by patients engaged in ED-initiated MOUD and referral services.

Methods:

Study Design

An ED-based MOUD-initiation program was launched at the University of Alabama at Birmingham (UAB) Hospital (> 70,000 annual patient visits) in July 2019. 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. Emergency physicians engaged potential enrollees in a brief negotiated interview to assess motivation to begin treatment for OUD. A physician-activated order in the electronic medical record notified research staff, 24/7, of an eligible patient. Research staff conducted enrollment and assisted with linkage to care and follow-up referral. Emergency physicians provided a 10-day ‘bridge’ prescription of buprenorphine/naloxone at time of enrolled patient discharge.¹³ Government Performance and Results Modernization Act (GPRA) assessments, comprehensive of extensive patient-specific information including basic demographics, substance use and abuse, as well as mental health and physical health QoL variables, were collected by research staff at time of enrollment and at three- and six-months post-enrollment.

Data Analysis

In January, 2020, retrospective analysis of study subjects enrolled from July, 2019, through December, 2020, was performed. 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 subjects (satisfaction with personal relationships, family/friend support and contact, QoL self-rating, personal health satisfaction, energy for life, satisfaction with self, and violence exposure) were considered (Table 1). Basic subject demographics, to include race and gender, were also considered. Descriptive statistics and Fisher’s Exact test were utilized to assess the data. All statistical analyses were performed using JMP Pro 14, and all statistical tests were performed at $\alpha = 0.05$ significance level (**See Additional File 1**).

Table 1
Quality of Life Survey Questions

Objective QoL Factors:
<ul style="list-style-type: none"> • (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:
<ul style="list-style-type: none"> • (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?
*QoL = Quality of Life

Results:

Eighty-nine patients were enrolled in the study during the 18-month timeframe. Of those eligible based upon time from initial enrollment, 31 (43.7%) completed three-month GPRA assessment, 28 (45.2%) completed six-month GPRA assessment. The majority were white (85.4%), male (61.8%), and between the ages of 25–44 (75.3%) (Table 2).

Table 2
General Demographics at Intake

Demographic	n = 89
Race	
White	76 (85.4%)
Black	12 (13.5%)
American Indian/Alaska Native	1 (1.1%)
Gender	
Male	55 (61.8%)
Female	34 (38.2%)
Age	
18–24	8 (9.0%)
25–34	33 (37.1%)
35–44	34 (38.2%)
45–54	9 (10.1%)
55–64	4 (4.5%)
65+	1 (1.1%)

In general, there were no significant changes in the objective QoL factors with subsequent GPRA assessments, with the exception being ‘financial needs met.’ The financial variable was found to improve at follow-up GPRA assessments, with 64.5% and 82.2% of respondents reporting that some or all of their financial needs were met at three- and six-months respectively as compared to 61.8% at intake ($p < .05$) (Table 3). Housing changes improved, however, were not significant; 15.7% reported homelessness during intake as compared to 3.2% at three-months and 3.6% at six-months ($p = .24$). No significant differences were found when considering race or gender with regards to housing, education, employment, or financial needs.

Table 3
Quality of Life Factor Survey Responses at Intake, 3- and 6-months

Objective Quality of Life Factor		p-value
Time from Enrollment		
Housing	Undomiciled/Shelter Housed Inpt. Med. Fac.	.24
Intake (n = 89)	14 (15.7%) 72 (80.9%) 3 (3.4%)	
3-month (n = 31)	1 (3.2%) 29 (93.5%) 1 (3.2%)	
6-month (n = 28)	1 (3.6%) 25 (89.3%) 1 (3.6%)	
Education	<HS HS/HS equiv. Some College Bachelors+	.42
Intake (n = 89)	17 (19.1%) 40 (44.9%) 24 (27.0%) 8 (9.0%)	
3-month (n = 30)	1 (3.3%) 14 (43.3%) 11 (36.7%) 5 (16.7%)	
6-month (n = 28)	3 (10.7%) 13 (46.4%) 8 (28.6%) 3 (10.7%)	
Employment	Employed Unemployed or Disabled	.11
Intake (n = 89)	28 (31.5%) 59 (66.2%)	
3-month (n = 31)	16 (51.6%) 15 (48.4%)	
6-month (n = 28)	13 (46.4%) 15 (53.6%)	
Financial Needs Met	No Some Completely	< .05
Intake (n = 89)	33 (37.1%) 47 (52.8%) 8 (9.0%)	
3-month (n = 31)	11 (35.5%) 11 (35.5%) 9 (29.0%)	
6-month (n = 28)	5 (17.9%) 18 (64.3%) 5 (17.9%)	
Subjectively-reported Pyschosocial Quality of Life Factor		p-value
Time from Enrollment		
Personal Relationship Satisfaction	Satisfied Neither Not Satisfied	< .05
Intake (n = 89)	46 (51.7%) 11 (12.4%) 30 (33.7%)	
3-month (n = 31)	26 (83.9%) 4 (12.9%) 1 (3.2%)	
6-month (n = 28)	21 (75%) 4 (14.3%) 3 (10.7%)	

Inpt. Med. Fac. = inpatient medical facility; HS = high school; equiv = equivalent; QoL = quality of life

Objective Quality of Life Factor		<i>p</i> -value
Time from Enrollment		
Family/Friend Support/Contact	Yes No	.40
Intake (n = 89)	70 (78.7%) 18 (20.2%)	
3-month (n = 31)	28 (90.3%) 3 (9.7%)	
6-month (n = 28)	23 (82.1%) 5 (17.9%)	
QoL Self-Rating	Very Good – Good Neither Poor-Very Poor	< .05
Intake (n = 89)	9 (32.6%) 25 (28.1%) 35 (39.3%)	
3-month (n = 31)	18 (58.1%) 10 (32.3%) 3 (9.7%)	
6-month (n = 28)	16 (57.1%) 12 (42.9%) 0 (0)	
Satisfaction with Personal Health	Satisfied Neither Dissatisfied	< .05
Intake (n = 89)	37 (41.6%) 15 (16.9%) 37 (41.6%)	
3-month (n = 31)	21 (67.7%) 7 (22.6%) 3 (9.7%)	
6-month (n = 28)	19 (67.9%) 7 (25%) 2 (7.1%)	
Energy for Life	None Some Yes	< .05
Intake (n = 89)	16 (18.0%) 63 (70.8%) 10 (11.2%)	
3-month (n = 31)	3 (9.7%) 18 (58.1%) 10 (32.3%)	
6-month (n = 28)	2 (7.1%) 23 (82.1%) 3 (10.7%)	
Satisfaction with Self	Satisfied Neither Dissatisfied	< .05
Intake (n = 89)	24 (27.0%) 8 (9.0%) 55 (61.8%)	
3-month (n = 31)	21 (67.7%) 8 (25.8%) 2 (6.5%)	
6-month (n = 28)	17 (60.7%) 9 (32.1%) 2 (7.1%)	
Violence Exposure	Yes No	.81
Intake (n = 89)	64 (71.9%) 24 (27.0%)	
3-month (n = 31)	21 (67.7%) 10 (32.3%)	
6-month (n = 28)	19 (67.9%) 9 (32.1%)	
Inpt. Med. Fac. = inpatient medical facility; HS = high school; equiv = equivalent; QoL = quality of life		

Multiple subjectively-reported psychosocial QoL variables demonstrated significant improvement at three- and six-month follow-up assessment. Satisfaction with personal relationships increased at three- and six-months as compared to intake (51.7% intake versus 83.9% three-month versus 75% six-month, $p < .05$).

'Very Good' and 'Good' QoL self-ratings increased from 32.6% at intake to 58.1% at three-months and 57.1% at six-months ($p < .05$). Reported 'satisfaction' with personal health and 'satisfaction' with self also increased (26.1% and 40.7% increase at three-months and 26.3% and 33.7% increase at six-months, as compared to intake, respectively; $p < .05$). Improvement in reported energy for everyday life was also significant; 18.0% reported 'no' energy at intake which decreased to 9.7% at three-months and 7.1% at six-months ($p < .05$). Female subjects were more likely to report violence exposure (85.7%) as compared to male subjects (57.9%) ($p < .0001$), however, no significant racial differences were noted in this regard. Among other psychosocial QoL factors, no significant differences were found with regards to gender or race with the exception of energy for everyday life; men reported more energy as compared to women ($p < .05$) and Black subjects reported more energy as compared to white subjects ($p < .05$).

Discussion:

This review reemphasizes the disproportionate social need and risk which impact the OUD population, particularly those seen in an ED setting. High rates of socioeconomic disparities, 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.¹⁴ Yamamoto et al., 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 controlling for low income.¹⁵ 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.¹⁶ 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 our study subjects at intake.

Engagement, however, in MOUD treatment and referral services, did result in a subsequent significant improvement for the majority of QoL factors assessed. Subjectively reported psychosocial variables appeared to be more consistently impacted than objective variables. This favor toward psychosocial factors may be, in part, due to the fact that social relationship and psychological variables may lend themselves to a more dynamic and rapid response than the assessed objective variables. Patients engaged in regular health care for chronic disease management, to encompass OUD, have been demonstrated to report improved overall wellness and health perceptions, even after only short time periods in treatment.¹⁷ Similar improvement in social relationship and psychological domains with MOUD treatment has been demonstrated in the outpatient-initiation setting previously.¹⁸ Interestingly, 'friend/family support/contact' did not improve, although, it was rated relatively high amongst our subjects at intake, almost 80%. Family and social network support have been shown to be important for treatment retention and adherence outcomes, however, this network for many individuals with OUD often encompasses drug-using friends.¹⁹ Engagement in a treatment program may isolate them from this

network. Similarly, many individuals with OUD may find relationships with family strained from previous conflict, often related to their OUD.

Objective variables considered in this review were less likely to demonstrate change. These factors, including housing, education and employment, may require more than six months to evidence significant change; therefore, impact on these factors may not have been adequately captured. It is certainly possible that these factors may see notable improvement over the course of a longer treatment or follow-up timeframe. 'Financial needs' was one objective factor which did significantly improve. This may be related to a number of factors associated with OUD treatment including less money spent on illicit drugs and more productive hours spent at work, for instance; while not significant, rates of employment were increased at three- and six-months as compared to intake, which may also directly impact financial security.

It is also notable that our study population demonstrated a high rate of violence exposure at intake, nearly three-quarters of respondents, even higher among women (85.7%). Unfortunately, similarly high rates of violence have been previously reported among substance users.²⁰ The gender discrepancy is also roughly consistent with national statistics on domestic and interpersonal violence;²¹ while both men and women experience violence, a larger percentage of these victims are female. The 'exposure to violence' percentages did improve with the MOUD intervention, however, was not a statistically significant. This trend may represent another example of a QoL factor that may see improvement over a longer timeframe of MOUD treatment, although, 'exposure to violence' is likely influenced by challenging domestic and environmental factors that may be difficult to address solely via OUD management. In prior studies, women have attributed a high level of domestic violence to partners who have OUD, which could influence future MOUD treatment to target all household members in order to effectively raise overall QoL.²²

It is unclear why, in our study, men reported higher overall levels of energy compared to women, and African Americans higher than Caucasians. Sociocultural norms and expectations may play into gender-reported differences. Certainly 'energy levels' and 'energy for everyday life' may be a QoL factor that gains more clarity with a longer research timeframe, as energy and physical health are often the product of improving other areas of one's life.

Limitations:

Our study was limited to a single site and as such, results may not be universally applicable. In addition, 40 (56.3%) subjects and 34 (54.8%) subjects, were lost to follow-up and did not complete three- and six-month surveys, respectively. Follow-up rates, however, were in line with or above those previously reported for OUD.^{23,24} The socioeconomic factors detailed in the discussion above, in addition to the complexities of opioid abuse and reuse, make follow-up and compliance with care an ongoing challenge for this patient population.

Conclusion:

In conclusion, similar to QoL outcomes demonstrated in outpatient and addiction treatment clinic settings, ED-initiated MOUD significantly improved a number of QoL factors, particularly subjective psychosocial factors, which may be more rapidly impacted. Further studies should target objective, long-term QoL factors such as housing, education, and employment in order to develop MOUD treatment plans with greater long-term impact and lower reuse rates.

Declarations

Ethics Approval and Consent to Participate:

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:

Not applicable

Availability of Data and Materials:

All data generated or analyzed during this study are included in this published article (and its supplementary information files).

Competing Interests:

CC reports no conflict of interest.

DH reports no conflict of interest.

JR reports no conflict of interest.

WC reports no conflict of interest.

LW reports no conflict of interest.

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Author Contributions:

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

LW – Study Concept and Design, Statistical Expertise, Acquisition of Funding

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