

Buprenorphine vs Methadone: A comparative study on treatment efficacy and quality of life in opioid dependent patients

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Abstract:

Background: Opioid use is a public health crisis, the very real possibility of a protracted epidemic of overdose deaths that constitute an ever-widening expanse of population. The public health response to any such epidemic should be to provide safer alternatives for the users. In case of an overdose crisis, this would imply providing a regulated supply of pharmaceutical-grade opioids. There are a few harm reduction interventions that are used globally as a response to this crisis, among them Opioid Substitution Therapy is laying the pathway for harm reduction in India and also improving quality of life.

The present study was done to assess the quality of life of opioid dependent patients after buprenorphine and methadone maintenance therapy, and also to assess the efficacy of maintenance treatment given as either buprenorphine or methadone.

Materials and methods: The study was observational, and non-randomised convenience sampling was done. The sample consisted of 60 opioid dependent patients registered for maintenance treatment as either buprenorphine or methadone at the Drug De Addiction clinic attached to the Department of Psychiatry, Govt. Medical College. Data were analysed using SPSS version 20. The statistical tests used were Chi-square, t-test, and statistical significance was calculated using two-tailed tests at the 95% confidence level.

Results: On comparison of QOL scores of all domains in MMT and BMT groups after 3 months, it is evident that the domain scores of 'social relationships' and 'environmental health' were slightly higher in the MMT group than BMT group while the domain scores of 'physical health' and 'psychological health' were slightly higher in BMT group than MMT group. But the difference between both groups was not found statistically significant ($p > 0.05$), signifying both drugs are equally effective in checking the opioid use withdrawal symptoms and improving QOL.

Conclusions: The present study suggested that opioid users have poor QOL and suffer from severe withdrawal symptoms during abstinence but by using methadone & buprenorphine, their QOL improved significantly and withdrawal symptoms can be minimised. This also improves treatment adherence.

Keywords: Methadone, Buprenorphine, OST, Opioid, QOL

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I. INTRODUCTION

Opioid use is a public health crisis around the world. There are approximately 13million people who inject drugs and around 1.7million of them are living with HIV¹, and then there are those who face deaths due to overdose². IDUs also face other medical issues including endocarditis, abscesses, cellulitis, venous blockage/phlebitis and gangrene^{3,4,5}. Despite these preventable health risks, many harm reduction interventions are underutilized by, or inaccessible to, opioid using youth⁶.

Most of the harm-reduction interventions are wasted down the drain regardless of these avoidable health risks. Nearly 2.26 crore individuals that are 2.1% of the country's population are opioid users which include Opium(or its variants like Doda/Bhukki), Heroin(or its impure form—smack or brown-sugar) and a variety of pharmaceutical opioids. National drug survey found that the most common opioid being used is Heroin(1.14%). It is followed by pharmaceutical opioids(0.96%) and Opium(0.52%). Also, approximately 8.5Lakh people who Inject Drugs(PWID). Opioid drugs were predominantly used by injection users(heroin—46% and pharmaceutical opioids — 46%). A substantial proportion of PWID report risky injecting practices⁷.

We globally are now facing the very real possibility of a protracted epidemic of overdose deaths that constitute an ever-widening expanse of population, many of whom fall outside the usual targets for harm reduction programs. Although several interventions are critical to helping with the response, including de-addiction centres, supportive housing programs, screening programs for at-risk youth, a drastic cultural shift is needed in how we perceive drug users and reduce credence on the criminal justice system. We cannot simply abdicate our responsibility for chronic opioid users at present who are walking into abyss with every injection. The public health response to any such epidemic should be to provide safer alternatives for the users. In case of an overdose crisis, this would imply providing a regulated supply of pharmaceutical-grade opioids.

Opioid substitution therapy(OST) is a “type of harm reduction initiative that offers people who are dependent on opioids an alternative, prescribed medicine like methadone or buprenorphine—which is swallowed rather than injected, which is usually administered orally in a supervised-clinical setting.”

In 2005, the World Health Organization(WHO) added both drugs to its Model List of Essential Drugs, and in 2009 it released guidance advising all countries to make OST key focus of treatment for people who inject opioids⁸. OST was found to be greatly effective in enabling people to reduce/cease injecting drug use, in turn greatly reducing risk of HIV infection^{8,9,10}. OST is an evidence-based intervention for opioid dependence that improves patients’ health and reduces the mortality rate^{11,12,13}. Over the past two decades, there has been an increasing interest in the QOL of OST patients. However, little is known about the QOL of long-term OST patients. The literature suggests that OST is effective in enhancing QOL at treatment entry but may have shortcomings in the long-term.

The present study aims to assess the quality of life of opioid dependent patients after buprenorphine- and methadone-maintenance therapy(BMT,MMT), and also to assess the efficacy of treatment given. Understanding the needs of patients is essential to be able to provide appropriate care.

II. MATERIALS AND METHODS

This comparative study was carried out on patients of the Drug-Deaddiction Clinic(DTC) attached to the Department of Psychiatry, Govt. Medical College from January 2017 to November 2017. A total of 60 adult subjects were selected for this study.

Study Design - Observational Study

Study Location - Drug-Deaddiction Clinic(DTC) attached to the Department of Psychiatry, Govt. Medical College.

Study Duration - January 2017 to November 2017

Sample Size - 60 patients

Subject Selection Method - The study population was drawn from opioid dependent patients registered for maintenance treatment at Drug-Deaddiction Clinic(DTC) attached to the Department of Psychiatry, Govt. Medical College.

Inclusion Criteria- Patients met the criteria for registration to start maintenance treatment for buprenorphine/methadone at DTC, that is the diagnosis of opioid dependence as per ICD-10. The patients who were older than 18years and cooperative and capable of understanding the questionnaires and gave consent to participate were included in the study. They complied with the requirement of daily coming to DTC and had at least two-failed attempts for achieving abstinence.

Exclusion Criteria - The patients who were uncooperative/unwilling to give consent were excluded from the study. Also, patients with severe hepatic or renal-impairment or severe respiratory dysfunction or hypersensitivity to drugs under study or severe dependence on other CNS depressants were excluded.

Procedural Methodology - The sample consisted of opioid dependent patients registered for the first time for maintenance treatment at Drug-Deaddiction Clinic(DTC) attached to the Department of Psychiatry, Govt. Medical College. Thirty patients were selected from the buprenorphine group and the other thirty from methadone. Data were prospectively collected from them between January2017 to November2017 at intake,1week,3weeks,and three-months after entry into study, using standardised questionnaires. The questionnaires were administered by the primary investigator and took approximately thirty minutes to complete. The intake and three-month follow-up questionnaires captured self-reported information on drug use,

risk behaviours, quality of life and withdrawal symptoms. At the cessation of treatment additional information was recorded regarding the reason for cessation, family involvement during treatment.

Follow up period of study–3months from the day of starting maintenance treatment.

Tools used in the study were–WHO Quality of Life-BREF Scale, Hindi Version (WHOQOL-BREF), Subjective Opioid Withdrawal Scale (SOWS), and Objective Opioid Withdrawal Scale (OOWS).

Statistical Analysis- Data were analysed using IBM-SPSS version20 made available by IBM-United States in 2011. The statistical tests used were Chi-square, t-test, and statistical significance was calculated using two-tailed tests at the 95% confidence level. Clients who had ceased OST for an unknown reason(n=0) were none, so no comparison could be drawn. The impact of OST on quality of life was assessed by comparing changes between baseline and three-month follow-up. The level $P < 0.05$ was considered as the cut off value of significance.

III. RESULTS

Table 1 shows the Objective Opioid Withdrawal Score (OOWS) and Subjective Opioid Withdrawal Score(SOWS) in MMT Patients. In the study, at the time of initiation of methadone, the mean of Objective Opioid Withdrawal Score(OOWS-1) was 10.40. At 7days, at 21days and after 3months, the means were (OOWS-2) 7.06 , (OOWS-3) 2.90, (OOWS-4) 0.85 respectively. While the mean of Subjective Opioid Withdrawal Scores at initiation(SOWS-1), at 7days(SOWS2), at 21days(SOWS-3) and 3months(SOWS-4) was 46.46, 30.16, 9.93 and 6.76 respectively.

Table 1: Shows Objective Opioid Withdrawal Score (OOWS) and Subjective Opioid Withdrawal Score(SOWS) in MMT Patients

| | Mean | N | Std. deviation |
|-------------------------------------|-------|----|----------------|
| OOWS-1 (At initiation) | 10.40 | 30 | 1.67 |
| OOWS-2 (At 7 th day) | 7.06 | 30 | 2.64 |
| OOWS-3 (At 21 st day) | 2.90 | 30 | 0.92 |
| OOWS-4 (At 3 months) | 0.86 | 30 | 0.86 |
| SOWS-1 (At initiation) | 46.46 | 30 | 7.16 |
| SOWS-2 (At 7 th day) | 30.16 | 30 | 10.78 |
| SOWS-3 (At 21 st day) | 9.93 | 30 | 4.27 |
| SOWS-4 (At 3 months) | 6.76 | 30 | 5.09 |

Table 2 shows correlations among Objective Opioid Withdrawal Scores (OOWS) and Subjective Opioid Withdrawal Scores(SOWS) in MMT patients. The correlation among OOWS with methadone by pairing OOWS-1 and OOWS-2(pair-1), OOWS-2 and OOWS-3(pair-2), OOWS-3, and OOWS-4(pair-3) was 0.478, 0.513, and 0.113 respectively and results showed that there was a statistically significant difference($p < 0.05$) in between OOWS-1 & OOWS-2, OOWS-2,& OOWS-3 but there was no statistically significant difference($p > 0.05$) between OOWS-3 & OOWS-4. When the OOWS scores were summed to assess the overall severity of withdrawal symptoms, it was found that withdrawal symptoms decreased significantly in the first three weeks, and after that almost sustained improvement was there for three months. The correlation among Subjective Opioid Withdrawal Scores by pairing SOWS-1 and SOWS-2 (pair-1), SOWS-2, and SOWS-3(pair-2), SOWS-3 and SOWS-4(pair-3) were 0.49,0.39,0.873 respectively and pairing results showed that there

was a statistically significant difference($p < 0.05$) in between SOWS-1 & SOWS-2, SOWS-2 & SOWS-3, and SOWS-3 & SOWS-4.

Table 2: Shows correlations among Objective Opioid Withdrawal Scores (OOWS) and Subjective Opioid Withdrawal Scores(SOWS) in MMT patients

| | | N | Correlation | p value |
|--------|---------------------|----|-------------|---------|
| Pair 1 | OOWS - 1 & OOWS - 2 | 30 | .478 | <0.05 |
| Pair 2 | OOWS - 2 & OOWS - 3 | 30 | .513 | <0.05 |
| Pair 3 | OOWS - 3 & OOWS - 4 | 30 | .113 | >0.05 |
| Pair 1 | SOWS-1 & SOWS-2 | 30 | .488 | <0.05 |
| Pair 2 | SOWS-2 & SOWS-3 | 30 | .394 | <0.05 |
| Pair 3 | SOWS-3 & SOWS-4 | 30 | .873 | <0.05 |

Table-3 shows Objective Opioid Withdrawal Score (OOWS) and Subjective Opioid Withdrawal Scores(SOWS) in BMT Patients. At the time of initiation of buprenorphine, the mean of the Objective Opioid Withdrawal Score(OOWS-1) was 9.96. At 7days, at 21days and after 3months, the means were (OOWS-2) 7.067, (OOWS-3) 3.23, (OOWS-4) 1.30 respectively. And the means of Subjective Opioid Withdrawal Scores of patients at initiation(SOWS-1), at 7days(SOWS-2), at 21days(SOWS-3) and 3months(SOWS-4) were 48.13, 39.93, 10.43,and 7.33 respectively.

Table 3: Shows Objective Opioid Withdrawal Score (OOWS) and Subjective Opioid Withdrawal Scores(SOWS) in BMT Patients

| | Mean | N | Std. Deviation |
|---------------------------------------|-------|----|----------------|
| OOWS-1 (At initiation) | 9.96 | 30 | 1.03 |
| OOWS-2 (At 7 th day) | 7.06 | 30 | 0.90 |
| OOWS-3 (At 21 st day) | 3.23 | 30 | 0.67 |
| OOWS-4 (At 3 months) | 1.30 | 30 | 0.83 |
| SOWS - 1 (At initiation) | 48.13 | 30 | 8.94 |
| SOWS - 2 (At 7 th day) | 39.93 | 30 | 6.23 |
| SOWS - 3 (At 21 st day) | 10.43 | 30 | 3.38 |
| SOWS - 4 (At 3 months) | 7.33 | 30 | 4.61 |

Table 4 shows correlations among Objective Opioid Withdrawal Scores (OOWS) and Subjective Opioid Withdrawal Scores (SOWS) in BMT Patients. The correlation in between OOWS-1 and OOWS-2(pair-1), OOWS-2 and OOWS-3(pair-2), OOWS-3 and OOWS-4(pair-3) were 0.444, 0.463, and 0.565 respectively and the results showed that there was a statistically significant difference($p < 0.05$) in between OOWS-1 & OOWS-2, OOWS-2 & OOWS-3 and OOWS-3 & OOWS-4. There was a marked improvement of withdrawal symptoms on BMT in opioid-dependent patients. The correlation among SOWS on BMT patients' results were 0.89, 0.37, and 0.87 respectively to pair 1, 2 & 3 and the results showed that there was a statistically significant difference($p < 0.05$). According to the scoring system of Withdrawal Scale, patients showed continuous improvement both objectively and subjectively for the first three months.

Table 4: Shows correlations among Objective Opioid Withdrawal Scores (OOWS) and Subjective Opioid Withdrawal Scores (SOWS) in BMT Patients

| | | N | Correlation | p value |
|--------|---------------------|----|-------------|---------|
| Pair 1 | OOWS - 1 & OOWS - 2 | 30 | .444 | <0.05 |
| Pair 2 | OOWS - 2 & OOWS - 3 | 30 | .463 | <0.05 |
| Pair 3 | OOWS - 3 & OOWS - 4 | 30 | .565 | <0.05 |
| Pair 1 | SOWS - 1 & SOWS - 2 | 30 | .899 | <0.05 |
| Pair 2 | SOWS - 2 & SOWS - 3 | 30 | .371 | <0.05 |
| Pair 3 | SOWS - 3 & SOWS - 4 | 30 | .866 | <0.05 |

In Table 5 and 6, the OOWS of the methadone and buprenorphine group were compared, and it is found that they were slightly higher in the BMT group than the MMT on the 7th-, 21st-day and 3rd month, while SOWS comparison revealed that there were higher SOWS at 7th-, 21s-day and 3rd month in BMT than MMT group. This result implies that methadone is more effective in controlling the withdrawal symptoms at the initial stage(up to 7days)of maintenance treatment than buprenorphine, but the efficacy of both drugs is nearly similar to each other in respect to withdrawal symptoms on the 21st day and after that. Though the withdrawal symptoms appears to be more severe in the Buprenorphine group.

Table 5: Shows comparison of OOWS between MMT and BMT groups

| OOWS | Mean \pm S.D. of OOWS | | t test | |
|--------|-------------------------|------------------|--------|---------|
| | MMT | BMT | T | p value |
| OOWS 1 | 10.40 \pm 1.67 | 9.96 \pm 1.03 | 1.20 | >0.05 |
| OOWS 2 | 7.06 \pm 2.64 | 7.067 \pm 0.90 | 0.00 | > 0.05 |
| OOWS 3 | 2.90 \pm .92 | 3.23 \pm 0.67 | -1.59 | >0.05 |

| | | | | |
|--------|-------------|-------------|-------|-------|
| OOWS 4 | 0.86 ± 0.86 | 1.30 ± 0.83 | -1.97 | >0.05 |
|--------|-------------|-------------|-------|-------|

Table 6: Shows comparison of SOWS between MMT and BMT groups

| SOWS | Mean ± S.D. of SOWS | | t test | |
|--------|---------------------|-------------|--------|---------|
| | MMT | BMT | T | p value |
| SOWS 1 | 46.46± 7.16 | 48.13± 8.94 | -0.797 | >0.05 |
| SOWS 2 | 30.16± 10.78 | 39.93± 6.23 | -4.295 | < 0.05 |
| SOWS 3 | 9.93± 4.27 | 10.43± 3.38 | -0.503 | >0.05 |
| SOWS 4 | 6.76 ± 5.09 | 7.33± 4.61 | -0.452 | >0.05 |

Table 7 shows comparison of QOL score between at initiation and after 3 months on MMT patients. Opioid-dependent patients on MMT showed marked improvement in quality of life after 3months. At the time of initiation, the mean transformed scores of domains of QOL were 1.63, 1.80, 16.50, 17.83, 20.17, 40.10 for ‘perceived QOL’, ‘perceived health’, ‘physical health’, ‘psychological health’, ‘social relationship’, and ‘environmental health’ respectively. The mean of total-QOL at time of initiation of treatment was 23.65. After 3months of MMT, mean transformed scores of domains of QOL was 4.04, 3.77, 56.23, 67.23, 46.83, 69.60 of ‘perceived QOL’, ‘perceived health’, ‘physical health’, ‘psychological health’, ‘social relationship’ and ‘environmental health’ respectively. The mean transformed score of total-QOL at the time of 3month of treatment was 59.97. Opioid-dependent patients on MMT showed marked improvement in quality of life after 3months. On comparing, QOL scores of patients at the time of initiation of MMT with QOL scores after 3months, it is evident that scores of QOL at 3months were higher in all the domains. The difference between them was found statistically significant(p < 0.05).

Table 7: Shows comparison of QOL score between at initiation and after 3 months on MMT patients

| Domain of quality of life | Mean ± S.D. of transformed score | | Paired t test | |
|---------------------------|----------------------------------|----------------|---------------|---------|
| | At initiation | After 3 months | T | p value |
| Perceived QOL | 1.63 ± 0.67 | 4.04 ± 0.61 | - 12.67 | < 0.01 |
| Perceived health | 1.80 ± 0.85 | 3.77 ± 0.50 | - 12.104 | < 0.01 |
| Physical health | 16.50 ± 11.06 | 56.23 ± 12.30 | - 15.972 | < 0.01 |
| Psychological health | 17.83 ± 14.17 | 67.23 ± 8.30 | - 14.412 | < 0.01 |
| Social relationship | 20.17 ± 14.66 | 46.83 ± 14.43 | - 7.151 | < 0.01 |

| | | | | |
|----------------------|---------------|---------------|----------|--------|
| Environmental health | 40.10 ± 12.41 | 69.60 ± 10.12 | - 12.644 | < 0.01 |
| Total | 23.65 ± 9.70 | 59.97±8.20 | -15.776 | <0.01 |

Table 8 shows comparison of QOL score between at initiation and after 3 months on BMT patients. Opioid-dependent patients on BMT showed marked improvement in QOL after 3months. At the time of initiation, it was found that the domain scores of ‘perceived QOL’, ‘perceived health’, ‘physical health’, ‘psychological health’, ‘social relationship’, ‘environmental health’ and ‘total QOL’ were 1.04, 1.33, 17.06, 14.90, 12.90, 38.90 and 20.94 respectively. After 3months of BMT, the mean of transformed scores of domains of QOL was 3.97,3.60,62.56,70.67, 46.06 ,69.40 of ‘perceived QOL’, ‘perceived health’, ‘physical health’, ‘psychological health’, ‘social relationship’ and ‘environmental health’ respectively. The mean of the transformed score of total QOL at the time of 3months of treatment was 62.17. Opioid-dependent patients on BMT showed marked improvement in QOL after 3months. The QOL scores of patients at the time of initiation and after 3months of BMT when compared, it was found that the scores of QOL at 3months of BMT were higher in all the domains. The difference between them was found statistically significant(p <0.05).

Table 8 shows Comparison of QOL score between at initiation and after 3 months on BMT patients

| Domain of quality of life | Mean ± S.D. of transformed score | | Paired t test | |
|---------------------------|----------------------------------|----------------|---------------|---------|
| | At initiation | After 3 months | T | p value |
| Perceived QOL | 1.04 ± 0.674 | 3.97 ± 0.49 | - 19.3 | < 0.01 |
| Perceived health | 1.33 ± 0.606 | 3.60 ± 0.621 | - 15.0 | < 0.01 |
| Physical health | 17.066 ± 8.800 | 62.56 ± 13.644 | - 15.78 | < 0.01 |
| Psychological health | 14.90 ± 8.723 | 70.67 ± 12.13 | - 21.45 | < 0.01 |
| Social relationship | 12.90 ± 13.04 | 46.06 ± 20.52 | - 8.85 | < 0.01 |
| Environmental health | 38.90 ± 10.58 | 69.40 ± 14.17 | - 12.90 | < 0.01 |
| Total | 20.94±7.30 | 62.17 ±12.76 | -19.24 | <0.01 |

Table 9 shows comparison of QOL score between MMT and BMT groups of patients after 3 months. On comparison of QOL scores of domains in between MMT and BMT groups after 3months, it is evident that the domain scores of ‘social relationships’ and ‘environmental health’ were slightly higher in the MMT group than BMT while domain scores of ‘physical health’ and ‘psychological health’ were slightly higher in BMT group than MMT. But the difference between both groups was not found statistically significant(p > 0.05).

Table 9 shows comparison of QOL score between MMT and BMT groups of patients after 3 months

| Domain of QOL | Mean ± S.D. of transformed score | | t test | |
|----------------------|----------------------------------|----------------|--------|---------|
| | MMT | BMT | T | p value |
| Physical health | 56.23 ± 12.30 | 62.56 ± 13.644 | -1.88 | >0.05 |
| Psychological health | 67.23 ± 8.30 | 70.67 ± 12.13 | -1.28 | > 0.05 |
| Social relationship | 46.83 ± 14.43 | 46.06 ± 20.52 | .167 | >0.05 |
| Environmental health | 69.60 ± 10.12 | 69.40 ± 14.17 | .063 | >0.05 |
| Total | 59.97±8.20 | 62.17 ±12.76 | -0.79 | >0.05 |

IV. DISCUSSION

Currently, substitution treatment with opioid agonists is widely accepted for many patients with opioid dependence, where both Methadone and Buprenorphine have been reported to be effective in the treatment of opioid dependence.

In brief, the data from this study did not show any significant differences in withdrawal symptoms between buprenorphine and methadone except for the first week . Since there were no baseline inhomogeneities between treatment groups, the main result is that both drugs were equally effective in the treatment of opioid dependence. In a study done by Soyka M.(2008)¹⁴ similar findings were reported, where the withdrawal symptoms decreased significantly, and the mean scores of the methadone group were slightly lower than those of the buprenorphine in the 1st seven days. However, the difference was not statistically significant. After 7days there was further significant decrease in mean OOWS in both groups. In another study done by Connock M (2007)¹⁵ on methadone and buprenorphine for the management of opioid dependence, it was reported that clinically flexible dosing strategy with MMT was somewhat more effective than flexible dosing BMT.

A few older studies had indicated better quality of life with methadone and buprenorphine(B.Nosyk (2015)¹⁶, Ying-Chun Chou (2013)¹⁷, Nizam B.(2012)¹⁸, Jessica De Maeyer (2013)¹⁹, Xiao L(2010)²⁰, Kobra L (2012)²¹, Zilvinas P.(2007)²², HuongAGW (2009)²³ and Ghodse H(2003)²⁴, Shannon G. M. (2015)²⁵ and A Dhawan (2013)²⁶. B. Nosyk¹⁶ found that OST has a significant effect on HRQOL, with effect sizes between 0.039(hero-in-users receiving BNX) and 0.071(Prescription Opioid-users receiving MMT). Ying-Chun Chou¹⁷ reported that the greatest mean gain was in the psychological domain(3.3) and the least in the social domain(1.06) at 6months follow-up. 12months follow-up from a baseline, there were significant improvements in the psychological domain, $p < .01$, and in the social domain, $p < .01$ while Nizam B.(18) reported that there was a significant improvement in all four domains of quality of life, after 6months of MMT. The largest improvement was for the psychological domain(mean score difference 15.54 ± 20.81). Xiao L²⁴ in their study reported that the QOL scores improved from day1 to day30(\bar{X} beginning=51.92, \bar{X} first month=74.83, $p < 0.01$), and all the subscale scores improvement was significant($p < 0.01$). However, there was little improvement in quality of life from day30 to day90, (\bar{X} third-month=75.99, $p < 0.01$).Physical and mental health showed significant improvement during the 2nd and 3rd month, while all other subscale scores did not. Kobra L²¹ reported that the total Quality of Life score showed improvement in a month. The improvement attained was sustained at the 2-month and 3-month($p < 0.05$). The treatment was effective in improving physical and social relationship domains over time($p < .05$), but there were no significant improvements in psychological and environmental domains. Zilvinas P.²² found significant improvements in physical($p=0.004$), psychological($p=0.004$), and environmental($p=0.048$) components of quality of life on six-months of methadone maintenance treatment; though there was no statistically significant improvement was noticed in the social component. Huong AGW²³ reported statistically significant improvements in all four-domains of WHOQOL-BREF($p < 0.01$). Ghodse H²⁴ also reported better drug-abuse related QOL for the patients who had been in treatment for at least 7months(IT2: $t=4.43, p < 0.00001$; IT4: $t=4.43, p < 0.00001$; IT3: $t=4.52, p < 0.00001$; IT4: $t=6.62, p < 0.00001$). Shannon G. M. (2015)²⁵ reported a statistically significant increase in mean QOL scores for all four QOL domains($p < 0.001$) over time. In 6-month follow-up, physical QOL-scores increased by 10.8%

from pre-treatment levels, while psychological, environmental, and social-QOL scores increased by 7.6%, 8.5%, and 11.2% on average. A Dhawan²⁶ in nine-months follow-up reported that in 64.1% retained in buprenorphine maintenance, there were significant improvements in the score of the four WHOQOL-BREF domains. While Peng-Wei Wang²⁷ reported that the severity of depressive symptoms and the levels of all four domains of QOL did not significantly improve in participants with HIV infection after 3-month MMT.

QOL scores were not found to be statistically different between both groups. Similar results were also reported in previous studies by Icro M.(2007)²⁸, B Nosyk (2015)¹⁶, Giacomuzzi SM (2005)²⁹, Marinkovic M (2017)³⁰, and Ponizovsky A. M. (2007)³¹. Icro M.²⁸ at a three-month evaluation found that the only significant differences between the groups were the work score and the total QLQ score, for which the condition of buprenorphine-treated patients was fairly better than that of methadone-treated ones. At the 12th-month evaluation, there were statistically and clinically significant general improvements in psychological and social conditions for both groups. While B. Nosyk¹⁶ found that the treatment had a uniformly positive and statistically significant association with HRQOL in each patient subgroup. The association of treatment on HRQOL was strongest among Prescription Opioid(PO) dependent individuals receiving time-unlimited treatment with methadone($p < 0.01$), and weakest among heroin-dependent individuals receiving maintenance treatment with BNX($p < 0.001$). The difference in HRQOL response to time-unlimited treatment was not statistically significant in either PO- or heroin-dependent individuals (PO:0.011; $p = 0.48$; heroin:0.004; $p = 0.59$). Also, HRQOL scores were not significantly different from baseline (pre-treatment) scores following discontinuation of time-unlimited treatment. Also, Giacomuzzi SM²⁹ reported that the values attained at baseline of the total sample (completers and non-completers) did not show significant differences between the two treatment groups in QOL and somatic complaints. Though, the buprenorphine-maintained group showed significantly less additional consumption of benzodiazepines($p = 0.015$) compared with methadone participants. Ponizovsky A. M.³¹ reported that the outcome changes in QOL mean scores between T0 (initiation), T1 (1 month), and T2 (4 months) for those who completed a 4-month MMT vs. BMT. The BMT patients did not improve their overall QOL between T0 and T1. At T1, they were doing better in only one domain, i.e., subjective feelings ($p < 0.05$). However, at T2 satisfaction with QOL and all specific life domains had significantly improved (all $p < 0.001$). In contrast, those in MMT had significantly improved their QOL scores in almost all specific life domains already at T1. These improved scores remained stable and untouched at T2, excepting the marginal increase in the general activities' domain ($p < 0.05$). In contrast to our study Marinkovic M³⁰ found a highly unsatisfactory perception of quality of life in opioid addicts in methadone programs than those treated differently, although the values of quality of life did not differ significantly.

V. CONCLUSION

The present study suggested that opioid abusers have poor QOL and severe withdrawal symptoms during abstinence. But by using methadone & buprenorphine as maintenance treatment their QOL improved significantly and withdrawal symptoms can be minimised. This also improves treatment adherence. The results of the current study should be interpreted in the background of following limitations of small sample size that included patients coming in DTC and OST clinics in tertiary care, located in an urban area, therefore study population may not be the true representative sample of the community and results cannot be generalised. Future study should be conducted with a large community-based sample that includes different centres in rural and urban areas and government as well as private sectors. Future studies may address the question whether more chronic patients might benefit from Methadone than from Buprenorphine treatment.

Availability of data and materials—The datasets supporting the conclusions of this article are included within the article. Raw data of individual patients was generated and tabulated. The data supports the findings of this study but not openly available as it can compromise research participant privacy.

LIST OF ABBREVIATIONS

OST—Opioid Substitution Therapy
IDU – Intravenous Drug Users
QOL – Quality of Life
MMT- Methadone Maintenance Therapy
BMT – Buprenorphine Maintenance Therapy
PWID - People Who Inject Drugs
HIV – Human Immunodeficiency Virus
WHO – World Health Organisation
OOWS – Objective Opioid Withdrawal Scale
SOWS - Subjective Opioid Withdrawal Scale
BNX – Buprenorphine and Naloxone combination
DTC – Drug Deaddiction Centre

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