

Determinants of Health Related Quality of Life (HRQOL) of Opiate Users at Entry to Low Threshold Methadone Programs

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Acknowledgments:

This study was originally funded by National Health Research and Development Program (NHRDP) grant no. 6606-06-2000, with continued support from the Canadian Institute for Health Research (CIHR) grant HHP-50150. Dr. Millson has been supported by a Scientist Award from the Ontario HIV Treatment Network (OHTN). We gratefully acknowledge the methadone programme staff for their assistance with recruitment, Sara Raftis for her work as an interviewer and the study participants for their time and effort in being part of this study.

Word Count

Abstract: 206 (including headings)

Text: 3984

Abstract

Objective: The aim of this study was to conduct an exploratory analysis of factors associated with poor health-related quality of life (HRQOL) among opiate users at entry to low threshold methadone treatment. **Method:** The SF-36 questionnaire was administered to 145 opiate users at enrollment into low-threshold methadone maintenance programs. ANOVA and correlational analyses were performed to investigate the determinants of poor physical and mental composite summary scales (PCS and MCS) of the SF-36 among opiate users. Stepwise regression methods were also employed to fit PCS and MCS multivariate models. **Results:** Age, employment status, chronic medical conditions, hospitalization, emotional abuse, sexual abuse and age at first injection episode were significantly associated with PCS. Mental health problems, sexual abuse, physical abuse, the use of sedatives, the use of cocaine, the number of days of cocaine use, sedative use and multiple substance use in the past month were significantly associated with MCS. The variances in the MCS and PCS were not readily explained by any one factor. **Conclusion:** The multiplicity of factors influencing HRQOL of opiate users suggests the need for a range of services within the context of a methadone program, addressing primary medical care needs as well as treatment for both mental health problems and abuse issues.

Key Words: low threshold methadone, quality of life, opiate addiction, addiction treatment, health status indicators

INTRODUCTION

Health-related quality of life (HRQOL) is increasingly being used in health and clinical research to complement other health status indicators and/or outcome indicators [e.g. 1, 2, 3, 4]. Quality of life “is a construct that reflects a person’s appraisals of their circumstances in relation to their expectations of life experiences” [5, p.58]. HRQOL incorporates both physical and mental health aspects of quality of life [6]. An important feature of this measure is that it allows for the inclusion of a patient or subjective evaluation of physical and mental health that would not otherwise be captured.

There is evidence that the HRQOL of opiate users at entry to treatment is among the lowest of any patient group; opiate users entering treatment such as the group in this study perceive their health, according to standardized measures, as worse than the general population and other chronic disease populations, but similar to individuals with major psychiatric conditions [7, 8]; these differences have previously been reported within the population included in the present study [9]. Such comparisons are important to furthering our understanding of how opiate users perceive their own health. However, they provide little guidance on how to change or improve the health of this population.

Herein, we analyzed determinants of HRQOL among participants enrolling in low-threshold methadone programs. These programs have been shown to attract clients who are unable or unwilling to enter more conventional, abstinence-oriented methadone maintenance treatment (MMT) or who have multiple failed attempts at such high threshold MMT [10,11]. The goal of low threshold programs is to maintain clients in treatment and work towards reducing the harms associated with opiate use (harm reduction approach) [10, 12]. This is accomplished by reducing the entry and retention criteria and not expelling individuals for continued drug use [10, 13]. Low threshold does

not equate to low dose (the mean methadone dose in the programs studied here is 90mgs/day). Clients and providers negotiate dose. These programs are intended to attract and retain very marginalized opiate users who are usually not in contact with other services. This allows for other needs to be addressed in the areas of physical, mental and emotional health, and practical issues such as housing and income supports.

To date, we know of only two studies that have investigated which individual factors are associated with poor HRQOL among drug users at entry to treatment [7, 8]. The first study, by Ryan et al, measured HRQOL using a standardized instrument, the SF36, in 100 heroin users entering a publicly funded methadone program in Australia. These subjects showed significantly worse physical and psychological health than a general population sample to which they were compared. The study by Stein et al examined HRQOL in 2688 patients being assessed for entry into drug and alcohol treatment at four programs in Boston. Only 27% reported injection drug use; 24% of the whole sample used heroin, and 36% cocaine, and the rest alcohol. While demographic factors including age, gender and race had impact on HRQOL, drug injection itself did not. Neither of these studies involved a low threshold methadone program. The increasing popularity of the low-threshold approach underscores the value of examining these associations in this treatment setting. In so doing, health care professionals and policy makers are better informed about the spectrum of factors associated with poor HRQOL. An improved understanding of the determinants of poor HRQOL in this population could assist in the development of multiple interventions that improve health and social situation among opiate users.

The objective of this study is to identify which factors, measured at entry into the low

threshold methadone program, are associated with poor physical and mental aspects of HRQOL.

METHODS

Participants

The participants in this study were opiate users recruited at enrolment into one of two low threshold methadone programs offered through needle exchanges in Kingston and Toronto, Ontario, Canada. All such individuals were approached to participate in a longitudinal study consisting of 3 interviews over a one-year period. Between December 2000 and August 2002, 211 opiate users enrolled in the programs, of whom 145 (69%) agreed to participate in the study. Here we present analysis of data collected during the first interview, which reflects pretreatment status.

The average age of the participants was 33 (range 18-54). Sixty-three percent of the sample was male. Eighty-nine percent (n=129) of participants were identified as white, 6% (n=9) Aboriginal or Metis and 5% (n=7) other, resulting in insufficient sample size to examine the effect of race in these analyses. More than half of the participants had not completed secondary school, while about half had either been unemployed or in a controlled environment (e.g. prison or hospital) for most of the time over the past 3 years. Almost half reported some illegal income in the 30 days prior to treatment entry approximately a quarter had received social welfare or pension income and a quarter had received employment income in the previous 30 days. About 6% were known to be infected with HIV, and about half with HCV. About half reported chronic medical problems not directly related to drug use, and about 60% self-reported mental health issues. Lifetime history of abuse was reported as about 80% for emotional abuse, 70% for physical abuse and 50% for sexual abuse. More than half had been previously

incarcerated, about one third were currently awaiting trial or sentence, and about one quarter were on probation or parole from a previous conviction. Mean duration of drug use was 20 years, and mean duration of injecting was 13 years. Almost all (96%) had a history of injection, the others met criteria for opiate dependence based on use of primarily oral opiates. About 80% had received previous drug treatment, and more than half had at least one previous episode of methadone treatment.

Trained study personnel administered a standardized interview schedule including an HIV risk questionnaire and a health-related quality of life instrument, the Medical Outcomes Study Short-Form 36 (SF-36) [14]. The human research ethics review board at the University of Toronto approved this study.

Survey Instrument

The SF-36 was derived from the larger Medical Outcomes Study to represent 8 of the most important health concepts: physical functioning (PF), role-physical (RP), bodily pain (BP), general health (GH), vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH). Standard algorithms were used to calculate two summary scales: the mental component scale (MCS), and the physical component scale (PCS). In order to calculate the summary scales, the eight SF-36 scales were standardized using means and standard deviations from the general population. Then they were aggregated using weights (factor score coefficients) from the general population. Finally aggregate PCS and MCS scores were standardized using a linear T-score transformation to have a mean of 50 and a standard deviation of 10, in the general population [15].

The physical health summary score is comprised of physical functioning, role-physical, bodily pain and general health while the mental health composite score is comprised of vitality, social functioning, role-emotional, and mental health. The standardized scale

scores range from 0 to 100 with higher scores reflecting better HRQOL. Scores reflect physical and mental function and well being, the extent of social and role disability and personal evaluation of health status.

The SF-36 instrument was chosen because it is a generic measure of HRQOL with broad applicability, and has been used extensively in a wide variety of patient populations [16-21]. The relative ease with which the SF-36 can be administered, the brevity of the instrument, and its successful application in a similar population [7] also played an important role in our decision to use it.

Our analyses were restricted to summary PCS and MCS scores; associations were not examined for the eight individual health scales. This was done for several reasons. The PCS and MCS are regarded as excellent summary measures of the 8 different health concepts of the SF-36 as they account for 80 to 85% of the reliable variance in these concepts [15]. This suggests that there is little information lost by using the two summary scales. In turn, when identifying a series of important predictors of health-related quality of life, the use of these two summary scales greatly reduces the number of statistical comparisons thereby reducing the chance of incurring a type 1 error, and facilitating the presentation of key findings. Moreover, the eight individual scales are substantially intercorrelated with each other and several domains have complicated physical and mental factor content. The complexities associated with disentangling such associations are simplified by the use of the PCS and MCS summary scales [15]. Finally, there are theoretical advantages to using only two summary indices. These include smaller confidence intervals relative to each of the eight scales, and the elimination of both floor and ceiling effects [15, 22].

Analysis

To assess whether our analytic approach was appropriate, we first calculated Pearson correlation coefficients between the 8 domains and the two component scales of the SF-36. This was done to evaluate whether the mental and physical component scales adequately represented the eight individual domains.

In order to investigate the predictors of PCS and MCS among opiate users, each factor was investigated independently using analysis of variance (ANOVA) (categorical variables) and Pearson correlations (continuous variables). All analyses were adjusted for the age of the participants. A priori, potential predictor variables were selected according to three broad categories: demographics, social and medical factors, and drug use. These factors were chosen either because of their perceived relevance or previously observed association in other drug use studies [7, 8]. Only those variables that were significant for either the MCS or PCS are displayed in the tables.

A stepwise regression model was then employed to investigate which factors were most important after the influence of other variables was taken into account. The p-value to enter and leave the model was set at 0.150. Statistical analysis was conducted using SAS, version 8 (SAS Institute, Inc., Cary, North Carolina).

RESULTS

PCS and MCS Values

The mean PCS and MCS for opiate users at entry to low threshold methadone programs is 45.5 and 37.1, respectively (Table 1). These may be roughly compared with the Canadian general population norms provided by Hopman et al [21], with means of 50.5 for PCS and 51.7 for MCS, with the proviso that Hopman's normative population is weighted much more heavily toward older individuals than the opiate population

described here.

Correlations between the eight physical and mental SF-36 scales and the physical and mental health component scales

As shown in Table 1, the physical domains (PF, RP, BP) correlate positively and significantly with the PCS. Correlations of RP and BP with MCS were also significant, although smaller than for PCS. The mental health domains (SF, RE, MH) also correlate positively and significantly with the MCS. One of these (SF) also correlated moderately with PCS. Finally, the GH and VT scales correlated moderately with both the PCS and MCS. These relationships are identical to those outlined by Ware et. al (1994) and the correlation coefficients are very similar to those found by Ware et al. (1994) when the component summary scales were developed [15]. This gives confidence in the ability of this study to use solely the PCS and MCS for this analysis.

Determinants of poor HRQOL

Within the study population, several demographic characteristics, social and medical factors, and drug use characteristics were significantly associated with the 2 summary scales of the SF-36 ($p < 0.05$).

Demographic factors

Demographic factors examined included: age, employment, education, sex and race. Age and unemployment were found to be significantly associated with low PCS (Table 2a). The mean PCS values were inversely associated with increasing age, and were the lowest among those who were retired/disabled, followed by students, the unemployed and those in a controlled environment compared to those who were employed. Employment status accounted for 13% of the variance in the PCS while age accounted for only 7% (Table 2a). Sex, education and race were not significantly associated with the PCS within this analysis.

None of the demographic variables were significantly associated with the MCS.

Social and Medical Variables

The social variables examined included: abuse in lifetime (physical, emotional and sexual), income sources (illegal and employment), incarceration (months in lifetime), and residing alone. The medical variables examined included: chronic physical conditions, mental health problems, hospitalizations, and infection with Human Immunodeficiency Virus (HIV) or Hepatitis C (HCV).

Having a chronic medical condition, being hospitalized for a physical problem in the preceding year, having experienced emotional abuse and having experienced sexual abuse were significantly associated with a low PCS. Chronic medical conditions accounted for 22%, hospitalization accounted for 14%, emotional abuse accounted for 13% and sexual abuse accounted for 11% of the overall variation in the PCS (Table 2a). No associations were observed among the remaining factors examined and the PCS.

Having experienced mental health problems (depression, anxiety, hallucinations or being prescribed medication for psychological or emotional problems) in the past 30 days was significantly associated with a low MCS. Having experienced either sexual or physical abuse in one's lifetime was also significantly related to a low MCS. However, only mental health problems explained a substantial proportion of the variance at 24% (Table 2b). No associations were observed among the remaining factors examined and the MCS.

Drug Use

The drug use characteristics examined included: age at first illicit drug use, age at first

injection, proportion and frequency of use of certain illicit drugs. These drugs included heroin, other opiates, speedballs, cocaine, crack, sedatives, alcohol, amphetamines, and marijuana.

Age at first injection was the only drug use factor significantly associated with the PCS: lower PCS scores were found for those who had experienced their first injection episode at younger ages. However, this variable did not explain much of the variance in the PCS (Table 3a). No associations were observed among the remaining factors examined and the PCS.

Cocaine use, sedative use, and the number of days of cocaine use, sedative use and multiple substance use in the past month were significantly associated with MCS (Tables 2b and 3b). However, the use of sedatives was the only factor that explained a fair percentage of the variance in the MCS at 10%. No associations were observed among the remaining factors examined and the MCS.

PCS and MCS Models

The final stepwise regression model for the PCS, based on variables with p values of 0.15 to enter or leave the model, included age, chronic medical conditions, hospitalization in the previous year, emotional abuse in one's lifetime and sexual abuse in one's lifetime. The r^2 value, or the amount of variance explained, for the overall model was 33%. Mental health problems, sexual abuse and the use of cocaine remained in the final stepwise regression model for the MCS. The amount of variance explained by this model was 39%. The overall r^2 value explained by these models was considerably higher than the r^2 value from any one individual factor.

DISCUSSION

Health related quality of life at entry into low threshold methadone treatment in this study population was low in both physical and mental health domains, similar to the findings of Ryan et al [7]. Our population scored lower in the physical domain than in the heroin user component studied by Stein et al [8], but had low scores in mental and social functioning similar to those found by Stein et al. The analyses presented here suggest that a complex array of factors influence the physical and mental well-being of opiate users. In particular, we found that age, lack of employment, chronic medical conditions, hospitalization, emotional abuse, sexual abuse and age at first injection episode were significantly associated with PCS. Mental health problems, sexual abuse, physical abuse, the use of sedatives, the use of cocaine, the number of days of cocaine use, sedative use and multiple substance use in the past month were significantly associated with MCS.

Opiate users who were employed reported better perceived physical health than those who were retired/disabled, students, unemployed or in a controlled environment. While the cross-sectional nature of the data limit our ability to determine whether poorer perceived physical health preceded or followed retirement, disability, unemployment or being in a controlled environment, this finding suggests an important link between employment and the physical health of opiate users. Methadone programs do not always include employment training programs, work skills workshops, educational opportunities and programs to reduce re-offending rates, however, these results suggest the need to develop programs that integrate services that address issues beyond the pharmacological maintenance of clients.

The importance of multi-faceted methadone programs is echoed in findings regarding

chronic medical problems and recent hospitalizations. In the year before methadone treatment entry 26% of this population experienced an overnight hospital stay. Other studies have noted delayed help-seeking among opiate users often attributed to fear of stigmatization [23, 24]. The integration of appropriate primary health care into methadone programs could improve the overall well-being of opiate users through treatment and prevention of medical problems, while decreasing the costs associated with preventable emergency care and hospital visits. However, current policy in Ontario tends to favour the provision of methadone separately from the provision of other primary care which represents an obstacle to holistic care of this high needs population.

Referrals for medical services may also be used to increase access to primary care. However, referral services are only effective if providers at the referral site are willing and equipped to address the multiple health care needs of opiate users.

The high prevalence of mental health problems (approximately 60% self-reported using the ASI) and their association with poor perceived mental health (MCS) are also indicative of the need for multi-faceted methadone treatment programs. These findings suggest that clients would greatly benefit from on-site psychiatric services or appropriate referral to psychiatrists or psychologists. However, the widespread practice of requiring abstinence prior to providing any form of mental health service creates a major obstacle to helping drug users with poor perceived mental health who are not ready or able to become abstinent. As a result, training and liaison with mental health professionals is crucial to ensure that methadone clients receive optimal mental health care.

The association between the use of sedatives in the past month and MCS scores may be directly associated with mental health conditions as sedatives may be used to treat

these conditions either through legal prescription or through self-medication. The use of these drugs may be an indication of the preponderance of mental health problems within this population. Sedative medications are also sometimes taken to “come down” from stimulants such as cocaine, and may be associated with the relationship identified between cocaine use and lower MCS. The significant association between both use and frequency of use of sedatives and MCS suggests that this finding is not a statistical artifact but does not really distinguish between the uses of sedatives for their direct impact on mental health related symptoms vs. modulation of effects of other drugs.

The significant association of cocaine use and frequency of use with MCS also has at least two possible explanations. Cocaine use can induce or unmask symptoms such as agitation and paranoia [25]; cocaine may also be sought out by persons suffering from depression and lack of energy for its stimulant effects [26]. Use of multiple substances in a day was also associated with lower MCS. Use of multiple substances may be a marker for more complex and chaotic drug use leading to poorer mental health, or for poorer mental health leading to more extensive drug use in a search for an improved sense of well-being. Longitudinal research could assist in better understanding the role that cocaine and use of multiple substances play in the alleviation or emergence of mental health problems.

Individuals who had experienced either emotional or sexual abuse in their lifetime had lower PCS, while those who had experienced either physical or sexual abuse reported lower MCS compared to those who had not experienced those kinds of abuse. It should be noted that abuse may occur alongside a myriad of problems within the home including family dysfunction, poverty, unemployment, alcoholism or drug addiction or some other form of inadequate social and family functioning [27] which does need to be

disentangled from the abuse itself. Whether due to the abuse or some other factor associated with abuse, there is a wide-ranging impact on participants' perception of health. Coupled with the extremely high rates of abuse, with the majority of clients reporting multiple forms of abuse, further research is urgently needed to assess the impact of abuse on this population and ways to treat this effectively, as well as its potential importance in primary prevention of drug abuse. At a minimum, counselling should be available to clients wanting to deal with their abuse issues.

In addition to increasing the types of services provided within the confines of methadone programs, attempts to attract opiate users into treatment earlier in their drug using careers require further attention. In this study we found that age at first injection episode (even after adjustment for age) was associated with poor perceived physical health. Programs that entice users into treatment earlier may help to mitigate some of the problems that impact drug users and adversely affect their HRQOL. Low threshold methadone may do this by allowing clients to enter treatment without expecting abstinence. This can encourage clients to come into contact with ancillary services which may improve quality of life while they continue to use drugs. Such ancillary services can be better suited to addressing underlying issues and this may in turn lead toward more controlled use or discontinuation of use.

LIMITATIONS and STRENGTHS

This study lacked statistical power to examine the effects of race, since only about 10% of participants were non-white. Some drugs had only a small proportion of participants using them (e.g. 13% speedballs; n=18), while in other cases, use was so common that there was only a small group of non-users for comparison, for example, other (non-heroin) opiates were used by all but 19% of participants (n=27).

Another limitation is the lack of temporal sequencing needed to examine causality.

These baseline data provide associations between quality of life and a variety of other factors, but for many of these factors we cannot determine that they directly contribute to lower quality of life. It may also be that quality of life is particularly poor at the point of entering into treatment (the concept of “hitting bottom”).

Our study measures rely on self-report rather than “objective” measures of health status. The significant association with age and employment status seen with physical health-related quality of life is what would be expected in other populations, and increases our confidence in the validity of responses being given. The presence of a significant relationship between both chronic physical conditions and PCS and mental health problems and MCS also provides support for the ability of both the PCS and the MCS to indicate the presence of important problems related to either physical or mental aspects of HRQOL, respectively, in this population.

CONCLUSION

This exploratory analysis identified factors associated with poor HRQOL as measured by the MCS and the PCS of the SF-36. This is the first study that has examined such associations among current opiate users at entry into a low threshold (i.e. harm reduction) methadone program. No one single factor, in either of the models, explained a substantial proportion of the variance in either the MCS or PCS. These results suggest that a number of factors together predict HRQOL of opiate users. Attempts to improve HRQOL in this population will therefore require availability of primary medical care, and of counselling for mental health problems and for help to deal with abuse issues, as well as additional assistance such as employment services. Evaluation of provision of these services should take into account the potential offsetting of their costs with savings from reducing the high rates of hospitalization and incarceration present in this population.

Table 1: Mean scores for physical and mental SF-36 component scales and correlations with physical and mental health component scales

	PF	RP	BP	GH	VT	SF	RE	MH	PCS	MCS
Mean score (max. 100)	79.9	58.4	54.7	49.5	36.4	63.9	49.2	53.2	45.5	37.1
PCS	0.80	0.76	0.72	0.61	0.37	0.45	0.06	0.11	1.0	
MCS	0.16	0.32	0.34	0.32	0.62	0.70	0.84	0.89		1.0

Bolded cells $P \leq 0.05$

Table 2a: Effect of demographic, social/medical and drug use variables on PCS

	N (%)	Adjusted mean PCS and 95% C.I.	P- value	Mean square	R ²
Age			0.02	378.77	0.07
<25	37 (25.5)	47.2 (43.7-50.1)			
25-34	39 (26.9)	48.9 (45.5-52.2)			
35-44	50 (34.5)	43.5 (40.5-46.5)			
45-54	19 (13.1)	41.0 (36.1-45.8)			
Employment*			0.02	361.89	0.13
Employment & service	48 (33.1)	49.3 (46.3-52.3)			
Student	7 (4.8)	41.8 (34.1-49.1)			
Retired/disabled	18 (12.4)	39.4 (34.3-44.4)			
Unemployed	55 (37.9)	44.7 (41.9-47.5)			
Controlled environment	17 (11.7)	45.8 (40.7-50.9)			
Chronic condition*			<0.01	327.07	0.22
No	64 (44.1)	50.9 (48.4-53.3.)			
Yes	81 (55.9)	41.3 (39.2-43.5)			
Hospitalized past year for physical problem*			<0.01	1598.90	0.14
No	111 (76.6)	47.4 (45.5-49.3)			
Yes	34 (23.5)	39.5 (36.1-43.0)			
Emotional abuse in lifetime*			<0.01	1406.99	0.13
No	28 (19.3)	51.9 (48.1-55.8)			
Yes	117 (80.7)	44.0 (42.1-45.9)			
Sexual abuse in lifetime*			<0.01	1239.53	0.11
No	72 (50.0)	48.4 (46.0-50.9)			
Yes	72 (50.0)	42.5 (40.1-45.0)			

* Adjusted for age

Table 2b: Effect of demographic, social/medical and drug use variables on MCS

	N (%)	Adjusted mean MCS and 95% C.I.	P- value	Mean square	R ²
Mental health problems past 30 days*			<0.01	6154.39	0.24
No	58 (40.0)	45.1 (42.0-48.1)			
Yes	87 (60.0)	31.7 (29.3-34.2)			
Sexual abuse in lifetime*			0.04	731.11	0.03
No	72 (50.0)	39.4 (36.3-42.5)			
Yes	72 (50.0)	34.9 (31.8-38.0)			
Physical abuse in lifetime*			0.04	784.27	0.03
No	44 (30.3)	40.6 (36.7-44.5)			
Yes	101 (69.7)	35.5 (32.9-38.1)			
Cocaine use past month*			0.002	1600.71	0.06
No	82 (56.9)	39.9 (37.0-42.7)			
Yes	62 (43.1)	33.1 (29.9-36.4)			
Sedative, hypnotics or tranquillizer use past month*			0.003	1595.23	0.10
No	84 (57.9)	40.2 (36.8-43.5)			
Yes	61 (42.1)	30.9 (25.9-35.9)			

* Adjusted for age

Table 3a: Partial correlation coefficients for drug use variables and PCS

	Partial correlation coefficient	P-value	Mean square	R ²
Age at first injection*	0.17879	0.04	500.95	0.08

* Adjusted for age

Table 3b Partial correlation coefficients for drug use variables and MCS

	Partial correlation coefficient	P-value	Mean square	R ²
Days of all sedative, hypnotics or tranquilizer past month*	-0.21089	0.01	1130.88	0.05
Days of cocaine use past month*	-0.17715	0.03	797.99	0.03
Days of more than one substance in a day past month*	-0.17860	0.03	811.06	0.03

*Adjusted for age

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