BRIEF COMMUNICATIONS

Dental Treatment Improves Self-Rated Oral Health in Homeless Veterans – A Brief Communication

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Abstract

Objective: *The aim of this study was to assess homeless veterans' perception of their oral health and the impact that oral disease and treatment have on self-assessed quality of life.* ***Methods:*** *Outcomes included measures of general and oral-specific quality of life and functional status. Single-item self-report of oral health and the General Oral Health Assessment Index were assessed at baseline and after treatment.* ***Results:*** *One hundred and twelve veterans completed the baseline questionnaire, and 48 completed the follow-up. Veterans who were eligible for ongoing dental care had improved General Oral Health Assessment scores, while patients who received only emergency dental care saw a decreased score (2.46 versus –2.12). General Oral Health Assessment improvement was significantly related to fewer teeth at baseline (18 versus 23), a lower baseline General Oral Health Assessment (23.6 versus 28.1), having a denture visit (22 versus 35 percent), and improvement in self-reported oral health (25 versus 42 percent).* ***Conclusion:*** *There was significant improvement in homeless veterans' perceived oral health after receiving dental care.*

Key Words: homeless, dental, oral quality of life, self-reported oral health

Introduction

The Department of Health and Human Services estimates that every year there are 2 to 3 million homeless in America. Although the face of the homeless has changed over time, from one of almost exclusively men to an increase in women and families, the majority of homeless are still men (1). Veterans make up a disproportionate number of homeless males in the United States with approximately one-third of all homeless males having served in the armed forces (2).

Homeless veterans have documented poor oral health, including a high prevalence of missing and decayed teeth, oral pain, and a need for dental care (3).

To document the impact of dental care as a part of the rehabilitation process, this study was undertaken to assess homeless veterans' perception of their oral health and the impact that oral disease and treatment have on quality of life.

Methods

This was a prospective study of the oral conditions, quality of life, and use of dental care at VA Medical Centers in Dallas, TX, and Bedford, MA. Institutional review boards at both facilities approved the study; all subjects gave written informed consent.

Participants included a convenience sample of veterans recruited from two VA homeless rehabilitation programs. The DOMiciliary Care for Homeless Veterans (DOM) provides housing, biopsychosocial treatment, and rehabilitation, which includes dental care. The Compensated Work Therapy (CWT) program allows homeless veterans staying in other housing programs to work for earnings in VA-sponsored employment with associated counseling. At the time of this study, CWT participants were eligible for emergency dental treatment only.

Primary outcomes of interest were measures of general and oral-specific health-related quality of life and functional status, the single item self-report of oral health (OH1), and the General Oral Health Assessment Index (GOHAI) (4) at baseline and after treatment. A priori, we also sought to determine whether improvements in oral-specific, health-related quality of life were associated with improvements in general health and self-esteem.

Measures. Participants completed a self-administered questionnaire prior to receiving any dental

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care or upon entering their rehabilitation program and upon completion of the program. Multiple attempts were made at follow-up contact, including phone contact and mailings to up to five known addresses.

The questionnaire consisted of sociodemographic data and two self-reported oral health quality of life indices: Global Self-Rated Oral Health (How would you describe the health of your teeth and gums? Excellent, very good, good, fair, or poor.) and GOHAI (A 12-question self-administered survey to assess functional oral health status, with a higher score denoting better oral health status.) (4).

There were also four measures of general or systemic health. These were the Rosenberg Self-Esteem Instrument (10 questions on a Likert scale measuring self-worth or value, with a higher score denoting higher self-esteem) (5), the Global Self-Rated General Health (In general, would you say your health is excellent, very good, good, fair, or poor, with a higher score denoting better general health.) (6), the Veterans RAND 12-Item Health Survey (VR-12) [12 items modified from the RAND 36-Item Health Survey 1.0, which measures self-perceived health status with a physical and a mental component. A higher score denotes a higher perceived sense of health. A separate Physical Component Scale (PCS) and Mental Component Scale were calculated from these data] (6), and the Selim Comorbidity Index score (a count of all unique diagnoses for each subject) (7).

The remaining questions related to self-reported dental hygiene practices and self-reported oral status, including number of teeth (participants were asked to count the teeth in each arch and include any pieces of teeth in the count), presence of removable prostheses, and frequency of problems related to the prostheses. Dental treatment information, including number and type of dental visits, was accessed and recorded through a national VA database.

Statistical Analysis. Chi-square and *t*-tests were used to test for differences between groups. Comparisons were made by site (Bedford versus Dallas) and by rehabilitation program (DOM versus CWT). Bivariate analyses examined improvements in GOHAI as a function of selected variables. We used $P < 0.05$ as a cutoff for statistical significance and $P < 0.15$ to indicate trends. The small number of posttreatment surveys precluded multivariate analysis. All analyses were conducted in Statistical Analysis Systems version 9.1.3 (SAS, Inc., Cary, NC, USA).

Results

One hundred and twelve veterans (mean age 46 years, 94.6 percent male) participated in this study. Overall, this group has a high rate of mental and physical comorbities (mean = 7.1), and most (72.9 percent) were current smokers. They had a poor initial outlook on their oral health, with 64.8 percent rating their overall oral health (OH1) as only fair/poor.

Baseline data comparing veterans in CWT and DOM and by site (Bedford versus Dallas) are in Table 1. CWT participants had significantly ($P < 0.05$) better GOHAI scores (28.6 versus 25.9) and were more likely to have a history of diabetes, gastroesophageal reflux disease, or schizophrenia than DOM participants. Conversely, more DOM patients had a history of drug use.

Results comparing the sites showed that Bedford veterans were significantly more likely to be White, have a higher comorbidity index, have a history of anxiety and bipolar disorder, and have better flossing habits. Twice as many Dallas patients reported using alcohol, and over five times as many reported using drugs.

Forty-nine participants (45 percent) completed the follow-up questionnaire. Comparison of this group with those who did not complete the follow-up show no significant differences, except that the follow-up group had significantly more comorbidities ($P = 0.04$).

Changes from baseline to follow-up are shown in Table 2. DOM patients had improved mean GOHAI scores, while CWT patients worsened. CWT participants also had a trend of greater decline in PCS score.

Frequency of visits and types of dental treatment differed in that DOM patients had a significantly higher number of overall visits (6.9 versus 3.7, $P = 0.04$), preventive care visits (2.3 versus 0.9, $P = 0.01$), diagnostic treatment (88 versus 53 percent, $P = 0.02$), and removable prosthetics (41 versus 13 percent, $P = 0.10$).

Bivariate analyses examined whether dental treatment, program affiliation, or other health measurements were related to improvements in self-reported oral health, as reflected in the GOHAI. GOHAI improvement was significantly related to having fewer teeth at baseline (18 versus 23, $P = 0.048$), a lower baseline GOHAI score (23.6 versus 28.1, $P = 0.005$), having a denture visit (22 versus 35 percent, $P = 0.033$), and improvement in self-reported oral health (25 versus 42 percent, $P = 0.007$).

Discussion

The most striking result of this study was that those who rated their oral health the poorest at baseline (GOHAI) and had fewer teeth were more likely to report significant improvement after receiving dental care. Eighty-four percent of those participants in the DOM program showed an improvement in their GOHAI versus 16 percent of the CWT veterans. This is an important finding because DOM clients are the ones who receive comprehensive dental care.

Over 65 percent of the homeless veterans surveyed at baseline rated their overall oral health as either fair or poor (OH1). This is consistent with a previous larger study in homeless veterans participating in VA programs (3), and like De Palma et al, our study describes a group of homeless individuals who started out with a poor concept of their oral health, but saw an improvement in the perception of their oral health after treatment (8).

There was a decline in many veterans' perceptions of their physical

Table 1
Baseline Characteristics of Homeless and CWT Veterans

	n	Mean (standard deviation) or frequency	CWT* (*n* = 33)	DOM† (*n* = 79)	Test statistics	*P*	Bedford (*n* = 77)	Dallas (*n* = 35)	Test statistics	*P*
Age (mean)	110	46.1 (6.4)	46.9	45.7	$t = 0.90$	0.37	46.6	45.0	$t = 1.25$	0.21
Number of teeth (mean)	108	20.8 (8.2)	21.9	20.4	$t = 1.04$	0.30	20.6	21.1	$t = -0.30$	0.77
Mental Component Scale‡ (mean)	91	44.8 (9.7)	43.2	45.6	$t = -1.29$	0.20	44.1	46.0	$t = -0.82$	0.42
Physical Component Scale‡ (mean)	91	47.2 (10.1)	46.2	47.7	$t = -0.66$	0.51	48.7	44.9	$t = 1.74$	0.09
General Oral Health Assessment Index (mean)	106	26.7 (5.1)	28.6	25.9	$t = 2.42$	0.02	26.7	26.6	$t = 0.18$	0.86
Rosenberg Self-Esteem Index (mean)	95	19.5 (5.9)	18.5	20.0	$t = -1.16$	0.25	19.0	20.3	$t = -1.09$	0.28
Comorbidity Index (mean)	110	7.1 (2.7)	7.6	6.9	$t = 1.20$	0.23	7.5	6.3	$t = 2.26$	0.03
Anxiety	110	37.3%	36.4%	37.7%	$\chi^2 = 0.02$	0.90	49.3%	11.4%	$\chi^2 = 14.70$	0.0001
Bipolar disorder	110	40.9%	54.6%	35.1%	$\chi^2 = 3.62$	0.06	48.0%	25.7%	$\chi^2 = 4.90$	0.03
Depression	110	79.1%	84.8%	76.6%	$\chi^2 = 0.94$	0.33	77.3%	82.9%	$\chi^2 = 0.44$	0.51
Diabetes	110	13.6%	24.2%	9.1%	$\chi^2 = 4.50$	0.03	14.7%	11.4%	$x^2 = 0.21$	0.64
GERD	110	14.6%	27.3%	9.1%	$\chi^2 = 6.14$	0.01	17.3%	8.6%	$\chi^2 = 1.47$	0.22
Hypertension	110	39.1%	42.4%	37.7%	$\chi^2 = 0.22$	0.64	34.7%	48.6%	$\chi^2 = 1.94$	0.16
Osteoarthritis	110	30.9%	33.3%	29.9%	$\chi^2 = 0.13$	0.72	36.0%	20.0%	$\chi^2 = 2.86$	0.09
Post-traumatic stress disorder	110	38.2%	33.3%	40.3%	$\chi^2 = 0.47$	0.49	41.3%	31.4%	$x^2 = 0.99$	0.32
Schizophrenia	110	19.1%	36.4%	11.7%	$\chi^2 = 9.11$	0.002	24.0%	8.6%	$\chi^2 = 3.68$	0.06
Race	97				$\chi^2 = 4.20$	0.52			$\chi^2 = 39.71$	<0.0001
White		67.0%	80.0%	62.5%			87.1%	31.4%		
Black		27.8%	16.0%	31.9%			8.1%	62.9%		
Other		5.2%	4.0%	5.6%			4.8%	5.7%		
Sex (% male)	112	94.6%	93.9%	94.9%	$\chi^2 = 0.05$	0.83	94.8%	94.3%	$\chi^2 = 0.01$	0.91
Dentate (% with teeth)	108	94.4%	100.0%	92.2%	$\chi^2 = 2.56$	0.11	94.5%	94.3%	$\chi^2 = 0.002$	0.96

Table 1
Continued

	n	Mean (standard deviation) or frequency	CWT* (*n* = 33)	DOM† (*n* = 79)	Test statistics	*P*	Bedford (*n* = 77)	Dallas (*n* = 35)	Test statistics	*P*
Single-item general health	95				$\chi^2 = 0.64$	0.96			$\chi^2 = 6.63$	0.16
Excellent		10.5%	9.7%	10.9%			13.3%	5.7%		
Very good		33.7%	35.5%	32.8%			31.7%	37.1%		
Good		40.0%	38.7%	40.6%			45.0%	31.4%		
Fair		14.7%	16.1%	14.1%			10.0%	22.9%		
Poor		1.0%	0.0%	1.6%			0.0%	2.9%		
Single-item oral health	108				$\chi^2 = 5.41$	0.14			$\chi^2 = 0.95$	0.81
Excellent		0.0%	0.0%	0.0%			0.0%	0.0%		
Very good		8.3%	6.4%	9.1%			9.6%	5.7%		
Good		26.8%	41.9%	20.8%			24.7%	31.4%		
Fair		37.0%	25.8%	41.6%			38.4%	34.3%		
Poor		27.8%	25.8%	28.6%			27.4%	28.6%		
Smoking	107				$\chi^2 = 1.57$	0.46			$\chi^2 = 3.96$	0.14
Current		72.9%	64.5%	76.3%			77.3%	62.5%		
Former		16.8%	22.6%	14.5%			16.0%	18.8%		
Never		10.3%	12.9%	9.2%			6.7%	18.8%		
Alcohol (% who use)	95	34.7%	25.0%	39.7%	$\chi^2 = 2.02$	0.16	23.0%	55.9%	$\chi^2 = 10.44$	0.001
Alcohol (% who drink ≥3/day)	95	30.5%	21.9%	34.9%	$\chi^2 = 1.70$	0.19	21.3%	47.1%	$\chi^2 = 6.82$	0.01
Drug use (% who use)	95	25.3%	6.2%	34.9%	$\chi^2 = 9.24$	0.002	9.8%	52.9%	$\chi^2 = 21.48$	<0.0001
Brushing frequency	103				$\chi^2 = 2.61$	0.27			$\chi^2 = 1.46$	0.48
≥1/day		85.4%	77.4%	88.9%			84.3%	87.9%		
1-6/week		11.6%	19.4%	8.3%			11.4%	12.1%		
<1/week		2.9%	3.2%	2.8%			4.3%	0.0%		
Flossing frequency	103				$\chi^2 = 3.65$	0.16			$\chi^2 = 6.52$	0.04
≥1/day		17.5%	22.6%	15.3%			22.9%	6.1%		
1-6/week		17.5%	25.8%	13.9%			20.0%	12.1%		
<1/week		65.0%	51.6%	70.8%			57.1%	81.8%		

* Compensated Work Therapy program.
Shading indicates statistical significance and trends approaching significance.
† DOMicillary Care for Homeless Veterans program.
‡ From the Veterans RAND 12-Item Health Survey.

Table 2
Change from Baseline to Follow-Up by Study Group

	n	Mean (standard deviation) or frequency	CWT* (*n* = 33)	DOM† (*n* = 79)	Test statistics	*P*
Days to follow-up (mean)	49	1,019 (717)	1,191	943	$t = 1.12$	0.27
Mental Component Scale‡¶	34	−3.4 (11.6)	−3.60	−3.29	$t = -0.07$	0.94
Physical Component Scale‡¶	34	−4.6 (9.3)	−8.34	−2.51	$t = -1.80$	0.08
Rosenberg Self-Esteem Index¶	36	0.6 (4.9)	1.20	0.35	$t = 0.50$	0.62
General Oral Health Assessment Index¶	46	1.2 (6.3)	−2.12	2.46	$t = -3.05$	0.004
Single-item general health	36				$\chi^2 = 2.60$	0.42
Declined		38.9%	46.2%	34.8%		
Improved		11.1%	0.0%	17.4%		
No change		50.0%	53.8%	47.8%		
Single-item oral health	47				$\chi^2 = 0.23$	0.92
Declined		23.4%	21.4%	24.2%		
Improved		31.9%	28.6%	33.3%		
No change		44.7%	50.0%	42.4%		

* Compensated Work Therapy program.
Shading indicates statistical significance and trends approaching significance.
† DOMicillary Care for Homeless Veterans program.
‡ From the Veterans RAND 12-Item Health Survey.
¶ Higher scores are better.

and mental health over time, as noted by the components of the VR-12. Previous studies suggest that chronic medical and mental health problems led some homeless veterans to seek VA services in the first place. Nayamathi et al. suggest "the use of health services promotes a greater sense of awareness, which in turn amplifies awareness/perceptions of need for health services" (9). This may also apply to our finding that those homeless veterans who participated in the CWT program had a decline in their GOHAI scores at follow-up, as this group of veterans received mostly emergency dental care.

The two-center design allowed for broader data collection in a population where follow-up is very difficult. Dental studies within the homeless are few; longitudinal follow-up is even rarer. To date, this is the largest longitudinal study published that addresses dental issues in the homeless. Nevertheless, it is small and thus did not allow for multivariate analyses of the outcomes. Schutt et al. suggested that "the difficulty in sampling homeless persons makes it unlikely that any single study will yield broadly generalizable results; rather the cumulation of smaller studies will be needed to get a good picture of the issues in the homeless" (10). This is a sample of veterans in a rehabilitation program, primarily men, and therefore the findings cannot necessarily be translated to the larger homeless population. Another limitation of this study is the variability in the timing of the follow-up surveys and the length of time between the baseline and follow-up surveys in some cases.

Conclusion

We found significant improvement in homeless veterans' perceived oral health after receiving dental care, supporting the notion that dental care is an important aspect in the overall concept of homeless rehabilitation. Further research with larger and more diverse patient pools within the homeless population would be ideal to fully discern the impact of dental treatment on oral-specific and general quality of life.

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