

**THE UNIVERSITY OF WASHINGTON ORAL MEDICINE CLINIC
PSYCHOLOGY SERVICE: WHEN AND WHY ARE PATIENTS REFERRED?**

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Abstract

The University of Washington Oral Medicine Clinic Psychology Service: When and Why are
Patients Referred?

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Psychosocial factors are known to be frequently associated with orofacial pain. The purpose of this retrospective case-control study was to characterize patients with orofacial pain who were referred by oral medicine specialists to an internal psychology service within the University of Washington Oral Medicine Clinical Services (OMCS) to discover demographic, clinical, and psychological variables that would explain when and why patients are referred. The group of referred patients was compared to a group of controls who had no history of an OMCS psychology referral. The primary aim was to measure levels of anxiety, depression, somatization, and somatization without pain using the Symptom Checklist (SCL-90R) instrument. The study population included 164 subjects that attended OMCS between July 2009 and December 2017 who were equally divided between the Referred case group and the Not Referred control group. Logistic regression analysis revealed that the Referred group had significantly higher levels of anxiety and depression when compared to the Not Referred group. The adjusted odds ratios

(OR, 95% CI; P value) of moderate and severe anxiety and moderate and severe depression for the Referred group were 2.60 (1.08 to 6.50; P = 0.037), 5.50 (1.65 to 22.60; P = 0.009), 0.94 (0.38 to 2.30; P = 0.90), and 3.10 (1.30 to 7.80; P = 0.013), respectively. Of note, the Not Referred group also had a high percentage of subjects with moderate or severe anxiety and depression. There were no statistically significant differences in somatization or somatization without pain between the two groups. This study found that there were prevalent psychosocial comorbidities among the study population as a whole that highlight the need for routine psychological screening and appropriate treatment to address any psychosocial distress detected.

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To my husband, Bart, who has always believed in me, who has given me his unwavering love and support while I pursue my dreams, and who has kept me going throughout the last twelve years with his humor and cooking.

To our spoiled dog, Butter, who makes me smile and who suffers through my constant affection.

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CHAPTER ONE

INTRODUCTION

1.1 OROFACIAL PAIN

The term *orofacial pain* encompasses any pain perceived in the face or mouth regions. It can be caused by diseases of regional structures, nervous system dysfunction, or through referral from distant sources.¹ Orofacial pain conditions range in complexity from acute pain that is often associated with odontogenic pathology to chronic pain that is multifactorial in nature. Orofacial pain is a prevalent debilitating condition and is one of the main reasons for the utilization of dental healthcare services. Results from the National Health Interview Survey (NHIS) suggest as many as 22% of adults in the United States experienced orofacial pain more than once during the preceding six months. Toothache was the most commonly reported type of orofacial pain, followed by oral sores, temporomandibular joint (TMJ) pain and facial pain, respectively.² Other studies evaluating patients in a tertiary care setting have shown toothache, TMJ and facial pain to be the most prevalent types of orofacial pain.³ The classification of orofacial pain has interestingly been shaped by its association with psychosocial factors. In 1992, researchers proposed a now widely used dual-axis classification system as part of the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD), consisting of one axis for physical diagnosis coordinated with a second axis for assessment of psychological distress, psychosocial dysfunction, and orofacial disability.⁴ The RDC/TMD divides Axis I diagnoses into three temporomandibular disorder (TMD) subtypes including myofascial pain with or without limited opening (Group 1); disc displacements with reduction and disc displacements without reduction (with or without limited opening) (Group 2); and arthralgia, osteoarthritis, and osteoarthrosis (Group 3). This type of diagnostic system can be applied more broadly in which physical (Axis I) conditions would include TMD, neuropathic pain disorders, neurovascular disorders, etc., and psychological (Axis II) conditions would include anxiety, mood, and somatoform disorders.

Orofacial pain conditions can undoubtedly be challenging to properly diagnose and manage due to their complex multifactorial etiologies. Therefore, in many cases, a multidisciplinary approach is necessary to illuminate all the causative and contributing factors, both physical and psychological, in order to provide the appropriate care required to restore the patient to their optimal functional status.

1.2 BIOPSYCHOSOCIAL MODEL OF PAIN

In 1977, Engel introduced the biopsychosocial model for medicine which helped stimulate interdisciplinary medicine, specifically for the management of pain conditions.⁵ The definition of pain describes it as “an unpleasant sensory and emotional experience,” which recognizes the complexity of pain beyond physical sensation alone.⁶ The biopsychosocial model of pain provides a comprehensive framework that addresses the complexity that defines the pain experience, particularly chronic pain. In 1992, Dworkin, Von Korff and LeResche defined a multidimensional model for chronic pain that further depicts the dynamic interaction of nociception, pain perception, pain appraisal, pain behavior, and social roles within pain and illness. Each element of chronic pain may be dysfunctional either due to minimization or intensification. *Nociception* refers to the physiologic events that transmit the noxious pain stimuli from the nociceptors, along the afferent neurons, and up to the central nervous system. *Pain perception* is the initial stage of the pain response where physical qualities of the pain are identified (e.g. intensity and quality). *Pain appraisal* signifies what the pain means to the individual due to emotions, beliefs, expectations, and memories that are attached to the perceived pain sensation. Subsequently, the response to pain in the form of observable behavior is the *pain behavior*, which can be the result of pain or a contributor to pain. Lastly, the *social role* for a pain patient describes their role in the family, the workplace, the health care system, and the broader society.⁷

1.3 PSYCHOLOGICAL DISORDERS

The World Health Organization (WHO) defines *mental health* as “a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community.”⁸ Mental health is a dynamic state that is determined by social, psychological, and biological factors. While mental health is not simply the lack of a mental disorder, descriptions of mental disorders help to frame our understanding and direct our treatment. The Diagnostic and Statistical Manual of Mental Disorders (DSM) published by the American Psychiatric Association (APA) is a common classification system used by mental health professionals to diagnose psychiatric illnesses. The latest version, DSM-5, includes categories such as anxiety disorders, neurodevelopmental disorders, dissociative disorders, gender dysphoria disorders, feeding and substance-related and addictive disorders to name a few.⁹ Mental disorders are highly prevalent in the United States. According to the 2016 National Survey on Drug Use and Health (NSDUH) an estimated 44.7 million adults 18 years or older, representing 18.3% of American adults, experienced *any mental illness* (AMI) in the past year. Adults with AMI were those that had any mental, behavioral, or emotional disorder that met DSM-IV criteria.¹⁰ Anxiety disorders and mood disorders (including major depressive disorder) are the most prevalent mental illness diagnoses at 18.1% and 9.5%, respectively.¹¹ Furthermore, the lifetime prevalence of any mental disorder has been shown to be as high as 47.4% of the U.S. population.¹² Consequently, mental health should be an important consideration in the evaluation and management of commonly comorbid conditions, such as chronic pain.

1.4 ASSOCIATION BETWEEN PAIN AND PSYCHOSOCIAL FACTORS

Mental disorders or symptoms may present at any point in time in relation to the onset of a patient’s pain – they may be pre-existing and active prior to the development of pain or become

active only with the onset of the new pain condition. Individuals with a pain condition have on average higher levels of anxiety, depression, and non-pain somatic symptoms as measured by the Symptom Checklist (SCL) scales, as well as more family stress compared to those without a pain condition.¹³ The number of pain conditions a person has is also of importance, as individuals with two or more pain conditions have an elevated risk of a major depression diagnosis. The number of reported pain conditions was even a better predictor of major depression than other important measures of pain, such as severity and persistence.¹⁴

Within a multidisciplinary facial pain clinic, there has been shown to be a high comorbidity between chronic facial pain (including TMD) and depressive disorders. For these patients with chronic facial pain, 28% met DSM-IV criteria for major depression, 25% for minor depression, and an additional 22% experienced subsyndromal depressive symptoms.¹⁵ Post-traumatic stress disorder (PTSD) has also been shown to be highly prevalent in orofacial pain patients. Multiple studies have found anywhere between 15% to 23.6% of patients with orofacial pain were PTSD-positive or had symptoms consistent with PTSD diagnosis. Furthermore, that subset of patients with co-occurring orofacial pain and PTSD symptoms had significantly higher levels of pain severity, psychological distress, sleep dysfunction, limited activity levels, and life interference due to pain.^{16,17}

1.5 MULTIDISCIPLINARY APPROACH TO TREATING OROFACIAL PAIN

A multidisciplinary approach to treating orofacial pain, comprised of therapies that address all biopsychosocial factors, can lead to more effective management and a lesser burden on daily functioning and overall quality of life. Psychological therapy has been widely explored as a complementary therapy when treating complex conditions, such as chronic pain. Cognitive behavioral therapy (CBT) is a standard form of psychotherapy that aims to help the patient

identify and replace maladaptive cognitions, emotions, and behaviors with more adaptive ones so as to increase function through improved coping. CBT is commonly used as a first-line therapy to maximize the benefit of other interdisciplinary care, such as pharmacotherapy. A Cochrane review of psychosocial interventions for chronic orofacial pain concluded that CBT, either alone or with biofeedback, resulted in long-term (>3 months) improvements in pain intensity, depression, and pain-related activity interference; however, the authors called for larger studies to substantiate these conclusions.¹⁸ Many studies have been completed assessing the impact of psychological treatment, often in combination with conventional treatment, on a variety of orofacial pain conditions. In patients with TMD with a muscular diagnosis, treatment with CBT (including hypnosis) combined with a conservative TMD protocol significantly reduced both frequency of pain and emotional distress compared to those that received the conservative TMD protocol alone, which in this case included splint use recommendations, jaw exercises and neck stretches, non-steroidal anti-inflammatory drugs, and/or muscle relaxant medication to cope with acute pain.¹⁹ Group CBT has also been shown to be effective in treating masticatory myofascial pain by better reducing pain intensity, duration, and frequency when compared to home care instructions.²⁰ Dworkin et al. conducted a randomized clinical trial assessing a tailored CBT program for patients who demonstrated a poor psychosocial adaptation to their TMD condition. The group that underwent a 6-session CBT program, in conjunction with the conservative TMD treatment, showed significantly lower levels of pain intensity, significantly higher self-reported ability to control TMD pain, and a strong trend toward lower pain-related interference in daily activities when compared to those that received the conservative TMD treatment only.²¹ Studies evaluating CBT as an intervention for other orofacial pain conditions have produced similar results. For patients with burning mouth syndrome (BMS), group CBT effectively reduced pain intensity and anxiety scores.²² CBT has also been shown to be an effective treatment option for patients with chronic migraine, where bi-weekly CBT for six months improved scores for anxiety, depression, pain intensity, frequency

of migraine attacks, and migraine disability.²³ The role of mental health providers is vital if a patient has any coexisting mental disorders, such as anxiety and depression, in addition to their pain condition. However, even in the absence of a mental disorder diagnosis, a mental health provider may work with the patient on improving maladaptive thoughts about their condition, developing coping skills, learning relaxation techniques, and making lifestyle changes (e.g. physical therapy, using medications, and exercise). Orofacial pain and oral medicine specialists generally receive training to manage orofacial pain conditions that is guided in some way by the biopsychosocial model for pain. Therefore, it is no surprise that webpages for many orofacial pain and oral medicine institutional clinics across the U.S. advertise a multidisciplinary approach to care for patients with orofacial pain conditions, particularly those that are chronic or complex in nature. Websites may describe screening tools for psychosocial distress that are used at initial visits; lists of potential therapies including CBT, mindfulness, stress reduction, and coping techniques; and psychologists, available either through their team or through other affiliated clinics in the institution, that the patient may be referred to if needed. However, with orofacial pain and oral medicine clinics being relatively few in number in the U.S. compared to many other medical specialty clinics, clinics that provide both treatment for orofacial pain and dedicated psychological services/CBT for those patients within the clinic are even less common. To provide some context, a basic internet search for “orofacial pain clinic psychology” and “oral medicine clinic psychology” only identified the seven following clinics with websites that advertised a multidisciplinary team that included a psychologist: UCLA Graduate Orofacial Pain and Dental Sleep Medicine Clinic; University of Kentucky Orofacial Pain Clinic; Stanford Facial Pain Program; University of North Carolina Dental Faculty Practice Orofacial Pain Group; Tufts Craniofacial Pain Center; University of Minnesota TMD, Orofacial Pain and Dental Sleep Medicine Clinic; and Rutgers Health University Dental Associates. Of note, it was not possible to determine exactly what role the psychologists in these clinics have in direct patient care.

There are few U.S. studies that specifically enumerate the broad spectrum of conditions treated in a comprehensive oral medicine clinic.²⁴⁻²⁶ Furthermore, to our knowledge, there has yet to be a study like this one which characterizes a clinical psychology service that solely treats patients with orofacial pain and oral medicine conditions. As we have described throughout this section, there has been a great amount of research completed that has improved our understanding of the complex relationship between psychosocial distress and pain, along with studies specifically evaluating orofacial pain. Of note, these studies generally restrict their focus to include only chronic orofacial pain, a specific condition (e.g. TMD), or orofacial pain conditions that are neuropathic, neurovascular, or musculoskeletal in origin. While these are not necessarily study limitations, they may not present the global picture of orofacial pain. We therefore sought to conduct this study by more broadly defining orofacial pain as a symptom, rather than limiting it by duration, condition, or tissue origin. This approach then allows for the inclusion of several additional types of oral medicine chief complaints and diagnoses (e.g. Sjögren's syndrome, lichen planus, oral ulcerations, movement disorders, etc.) that can be associated with orofacial pain, yet fall outside the typical scope of orofacial pain research. This would ideally provide additional understanding of the relationship between orofacial pain symptoms and psychosocial distress, dysfunction, or interference that may be especially useful in typical clinical care where individual patients often do not fit into the discrete categories we commonly use.

1.6 PURPOSE

The intention of this study was to see how the relationship between orofacial pain and psychosocial factors manifests in an oral medicine clinic, specifically the University of Washington School of Dentistry Oral Medicine Clinic. Oral medicine specialists in the university's Oral Medicine Clinical Services (OMCS) serve to bridge the gap between dentistry and medicine through diagnosis and non-surgical management of orofacial pain; temporomandibular disorders (TMD); nerve and neurosensory disorders; movement disorders;

oral mucosal diseases; oral cancer/dysplasia; salivary gland dysfunction; obstructive sleep apnea; oral manifestations of systemic disease; and oral complications of medical therapy (including chemotherapy and radiation). The clinic additionally operates an internal psychology service available to OMCS patients that is staffed by one or more clinical psychologists. This service reflects the need for multidisciplinary management that includes mental health providers and serves to better address the complexities commonly seen in the oral medicine patient population. The purpose of this study was to characterize the population of OMCS orofacial pain patients who ever received a referral to this internal psychology service using demographic, clinical, and psychological factors and then subsequently compare them to orofacial pain patients who had no history of a psychology referral. This study may reveal factors that significantly differ between referred patients and patients not referred, which providers could then use to improve and guide their screening of future patients for psychosocial factors. Our study findings may also help to expedite patient psychology referrals by highlighting factors and clinical scenarios that warranted referral in the past, which would allow for the identification and referral of those patients earlier in treatment. On the other hand, the study may also illustrate an underutilization of the psychology service, which could be improved by highlighting the variables and patient scenarios that would reasonably warrant a referral, and yet are inadvertently overlooked in daily practice. Finally, the chart review portion of the study additionally serves as an evaluation of the referral process of patients from the oral medicine specialists to OMCS psychology, which could help to better standardize the referral process and address any barriers detected within it.

1.7 AIMS

1. Characterize the OMCS orofacial pain patients who were referred to OMCS psychology using the following factors:

- Demographic factors

- Clinical factors
 - Psychological factors
2. Compare the referred patients to a group of controls who had no history of referral to determine if any factors significantly differ between the groups.
 3. Determine which factors the oral medicine providers consider in their decision-making process when considering a psychology referral for a patient.

1.8 RESEARCH QUESTIONS

1. Will OMCS patients referred for psychological services report, on average, greater or lesser levels of overall Axis II psychosocial distress compared to OMCS patients not referred for psychological services?
2. Will OMCS patients referred for psychological services have a higher or lower prevalence of specific types of psychological conditions compared to OMCS patients not referred for psychological services?
3. Will OMCS patients referred for psychological services be more or less likely to use psychiatric medication compared to OMCS patients not referred for psychological services?
4. Will OMCS patients referred for psychological services report, on average, shorter or longer durations of their chief complaint compared to OMCS patients not referred for psychological services?
5. Will OMCS patients referred for psychological services report, on average, higher or lower pain scores compared to OMCS patients not referred for psychological services?
6. Will OMCS patients referred for psychological services report, on average, a greater or lesser overall number of painful symptoms compared to OMCS patients not referred for psychological services?

7. Will OMCS patients referred for psychological services report, on average, more or less pain-related disability and pain interference compared to OMCS patients not referred for psychological services?
8. Will OMCS patients referred for psychological services have a higher or lower rate of oral medicine complaints associated with higher pain, chronicity, and disability (e.g. chronic migraine, trigeminal neuropathic pain) compared to OMCS patients not referred for psychological services?
9. Will OMCS patients referred for psychological services live closer to or further from the OMCS clinic, on average, compared to OMCS patients not referred for psychological services?
10. Will OMCS patients referred for psychological services be more likely to have public or private insurance compared to OMCS patients not referred for psychological services?
11. Will OMCS patients referred for psychological services have greater or fewer treatment visits and longer or shorter durations of treatment compared to OMCS patients not referred for psychological services?
12. Will factors that OMCS faculty report most commonly considering in their decision to refer a patient to the psychology service align with or differ from the significant factors reflected in the chart review?

CHAPTER TWO

METHODS

2.1 STUDY DESIGN

This study was conducted after receiving approval from the University of Washington Institutional Review Board (IRB ID: STUDY00006759). This study consisted of two parts – a retrospective patient chart review, which was the primary focus of the study, and a supplemental survey administered to clinicians. The retrospective case-control portion of the study utilized patient electronic health record (EHR) data at a university-based oral medicine clinic to examine the population of patients who were referred to the clinic’s psychology service and compare it to a patient population who had no history of a referral to the psychology service. There are likely additional factors that affect a clinician’s decision to refer a patient or not, yet those factors may not be evident from the EHR. Therefore, a brief survey was administered to the oral medicine clinicians to complement the patient-centered case-control study. The goal was to provide additional insight into the clinician’s decision-making process when considering a referral to the clinic’s psychology service.

2.2 SETTING

This study included subjects from the University of Washington School of Dentistry Oral Medicine Clinic. At the time of this study, the Oral Medicine Clinical Services (OMCS) was staffed by six oral medicine specialists. These dental specialists diagnose and provide non-surgical management of orofacial pain; temporomandibular disorders (TMD); nerve and neurosensory disorders; movement disorders; oral mucosal diseases; oral cancer/dysplasia; salivary gland dysfunction; obstructive sleep apnea; oral manifestations of systemic disease; and oral complications of medical therapy (including chemotherapy and radiation). The clinic

additionally operates an internal psychology service available to OMCS patients that was staffed by one clinical psychologist at the time of this study.

2.3 SUBJECTS

2.3.a Procedure for finding cases

The referral process from the OMCS oral medicine clinicians to OMCS psychologists was not uniform over time; therefore, multiple approaches were utilized to effectively capture the maximum number of potential case subjects. This required reviewing the referral process in reverse, from the psychologist to the oral medicine clinician, while searching for a proxy sign that would indicate a referral was given (e.g. any scheduled appointment with an OMCS psychologist would indicate the subject was previously referred to them by an OMCS oral medicine clinician). The referral date was then designated as the appointment date that immediately preceded any of the following documented referrals or proxy signs of referral:

- Paper or emailed referral was sent from oral medicine specialist to OMCS psychologist
- Contact notes were documented in the electronic healthcare record (AxiUm) by OMCS psychologist following an introductory phone call they made to a referred patient
- Appointment logs in AxiUm that included any scheduled appointment with OMCS psychologist including completed appointments or any scheduled appointments that were cancelled, deleted, or failed
- Billing records in AxiUm that included any completed appointment with OMCS psychologist

Psychologist #1 began patient care in the OMCS clinic well before the dental school's launch of the electronic dental software, AxiUm, on July 1, 2009. Therefore, they did not utilize AxiUm for patient scheduling and generally maintained use of paper-based referrals and chart notes for the remaining three years they treated OMCS patients after the launch of AxiUm. The paper-based

referrals and chart notes were ultimately unavailable to use for the data collection completed a decade later. Potential case subjects referred to psychologist #1 were thus limited to those who had completed appointments with psychologist #1. These subjects were identified using the AxiUm Info Manager to search billing records belonging to psychologist #1. This list was filtered to include only billing for a “psych diagnostic interview,” which was billed for all initial visits. Subjects who completed this initial diagnostic interview prior to the AxiUm launch on July 1, 2009 were also filtered out. There were 46 potential cases from psychologist #1 remaining prior to applying the inclusion and exclusion criteria described in the next section. Psychologist #2 began patient care in the OMCS clinic after the launch of AxiUm software, therefore all records were accessible electronically. Psychologist #2 was thus able to provide a list of all appointments (including completed appointments or any scheduled appointments that were cancelled, deleted, or failed) that took place in OMCS between July 1, 2009 and April 3, 2019. Additional potential case subjects were added from paper referrals, email referrals, and contact notes recorded in AxiUm by psychologist #2. Duplicates were filtered from the list by removing multiple entries for each subject as well as any subjects transferred from psychologist #1. There were 107 potential cases from psychologist #2 remaining prior to applying the inclusion and exclusion criteria described in the next section.

2.3.b Procedure for finding controls

Each case subject was matched to a control subject with a 1:1 ratio. The purpose of the matching procedure was to control for factors that one would expect to clearly impact a referral decision – the treating oral medicine provider and the time at which the patient was seen. This was accomplished by selecting a control subject who was treated by the same oral medicine provider either directly before or after a case subject was referred to OMCS psychology. An online coin flip instrument was used to decide if the control subject selected was the patient seen directly *before* or *after* the case subject. This technique was meant to account for any potential bias the oral medicine provider may have had after having just given a psychology referral to a previous

patient. In the event that the selected patient did not meet inclusion or exclusion criteria, we proceeded in the same direction to the next patient until inclusion and exclusion criteria were met and a control subject was selected. The date of service for that appointment was designated as the match date for the control subject.

2.4 INCLUSION CRITERIA

Cases (Referred)

1. Subject presented in OMCS for initial examination between July 1, 2009 (date dental school launched EHR) and December 31, 2017.
2. Subject ≥ 18 years old at initial examination
3. Subject reported orofacial pain at initial examination denoted by at least one of the following:
 - a. Endorsement of pain in the mouth, teeth, jaws, joints (jaw), face, and/or head in the intake questionnaire given at the initial examination
 - b. Report of pain documented within the chief complaint or history of present illness sections of the initial examination chart note
4. Subject referred to OMCS psychology between July 1, 2009 and December 31, 2017.

Controls (Not Referred)

1. Subject presented in OMCS for initial examination between July 1, 2009 (date dental school launched EHR) and December 31, 2017.
2. Subject ≥ 18 years old at initial examination
3. Subject reported orofacial pain at initial examination denoted by at least one of the following:
 - a. Endorsement of pain in the mouth, teeth, jaws, joints (jaw), face, and/or head in the intake questionnaire given at the initial examination

- b. Report of pain documented within the chief complaint or history of present illness sections of the initial examination chart note
4. Subject had no documented referral to, or appointments with, OMCS psychology between July 1, 2009 and December 31, 2017.

2.5 EXCLUSION CRITERIA

The primary purpose of this study was to examine this referred patient population in its entirety; therefore, we set exclusion criteria with the intention of only excluding subjects if there were significant barriers to data access required for the study. Subjects were excluded if their EHR was inaccessible, most commonly due to an accounting hold, or if no intake questionnaire was available in the EHR.

2.6 STUDY DATA AND MEASURES

2.6.a Retrospective case-control study

Demographic variables collected from EHR for each subject included age, gender, race, ethnicity, marital status, education level, occupation, insurance status, and residential ZIP Code. Clinical variables collected included:

- The duration of the oral medicine chief complaint collected at initial visit
- Current, average, and worst pain intensities (0-10 scale) were collected for both the initial and referral/match visits
- Graded Chronic Pain Scale (GCPS) responses and scores collected at initial visit (GCPS questions and scoring are provided in **Figures 2 and 3** in the **Appendix**)
- Number of other pains (eye pain, earaches, sore throat, facial pain, headache, migraine, chest pain, abdominal pain, neck pain, back/shoulder pain, joint aching/pain, muscle aching/cramping, skin burning, other) selected from intake questionnaire at initial visit

- Medical conditions selected from intake questionnaire list at initial visit
- The total number of oral medicine visits completed up to and including the referral/match visit
- The duration of time between the initial visit and referral/match visit
- Oral medicine diagnosis(es) documented in chart note at referral/match visit
- Symptom Checklist-90R (SCL-90R) responses and scores collected at initial visit (SCL-90R measures are shown in **Figure 4** in the **Appendix**)
 - The SCL-90R scale used in OMCS clinic is a shortened (46-item) and revised version of the original SCL-90 that specifically assesses depression, anxiety, and somatization and requires less time to complete.
- Psychiatric conditions selected from intake questionnaire at initial visit or documented in chart notes from either the initial visit or referral/match visit
- Psychiatric medications written in intake questionnaire at initial visit or documented in chart notes from either the initial visit or referral/match visit
- The number of visits completed with OMCS psychology after the referral visit (*cases only*)

2.6.b Survey of OMCS oral medicine specialists

An online survey was created and administered using REDCap© software (Research Electronic Data Capture, hosted at the University of Washington). The survey link was emailed to the eight current oral medicine clinicians who provide care in OMCS (as of 2019), six of whom provided care in OMCS sometime during the period covered by the chart review (July 2009-December 2017). The survey was voluntary, and all responses were provided anonymously. The survey listed several factors and patient scenarios that may impact the clinician's decision to refer a patient to the clinic's psychology service. Responders were first asked to use a Likert scale to rate how often each factor or scenario would influence their decision to refer, and secondly, they were asked to select the factors and scenarios that most commonly influence their decision to

refer in their typical daily practice. The complete survey questionnaire is shown in **Figure 5** in the **Appendix**.

2.7 STATISTICAL ANALYSIS

Data extracted from patient EHR in AxiUm and from the survey of oral medicine clinicians were entered into REDCap© software. The data were exported into an Excel spreadsheet then further analyzed using R software. Appropriate descriptive statistics were calculated for the case and control groups including frequency and percentage, mean and standard deviation, and median and interquartile range. The chi-square test, two-sample t-test, Mann-Whitney test, and Fisher's exact tests were all utilized to compare the case and control groups to each other. The significance threshold was set at 0.05. Unadjusted and adjusted logistic regression models were also used to assess differences in SCL-90R measures of anxiety, depression, somatization, and somatization without pain between the Referred and Not referred groups.

CHAPTER THREE

RESULTS

3.1 DEMOGRAPHIC VARIABLES

The study population included a total of 164 subjects who were evenly divided between the Referred case group (N = 82) and the Not Referred control group (N = 82). The sociodemographic characteristics of the study population are provided in **Table 1**. The Not Referred subjects were significantly older, on average, with a mean age of 54.2 (standard deviation [SD] 17.7) years compared to 48.4 (SD, 17.4) years for the Referred subjects (P = 0.036). The vast majority of subjects in both groups (Referred, Not Referred) identified themselves as female (84.1%, 78.0%), white (85.4%, 84.1%) and being married (59.8%, 67.1%). The education levels significantly differed between the groups with a higher percentage of the Referred group reporting at least some college and a smaller percentage reporting 12 years of education or less when compared to the Not Referred group (P = 0.012). However, the analysis excluded the sizable group of subjects who left this question unanswered (N = 52). Most Referred subjects were employed (57.3%) or retired (20.7%) with the same trend of employed and retired observed for the Not Referred group (52.4%, 28.0%, respectively). The third most common occupation group included those who described themselves as students, as disabled or having Social Security Insurance, or in terms that did not fit into the other defined categories. Insurance status also did not significantly differ between the two groups with the vast majority of both Referred (90.2%) and Not Referred (87.8%) subjects having private insurance, which included subjects with private insurance only as well as those with private insurance and Medicare/Medicaid. Subjects' residential ZIP Codes were used to calculate driving distance in miles to the ZIP Code of the OMCS clinic as a reasonable estimation of their travel burden. Referred subjects lived, on average, significantly closer to the clinic with a median driving distance of 14.2 miles (interquartile range [IQR] 7.1 to 14.2) compared to a median distance of

22.6 miles (IQR, 13.2 to 58.9) for Not Referred subjects (P = 0.023). A further breakdown of driving distances into categories of ≤ 10 miles, >10-20, >20-40, >40-100, and >100 miles is given in **Table 1**, which indicates that a quarter of the study population resides over 40 miles from the clinic and 12% reside over 100 miles from the clinic.

Table 1 – Sociodemographic characteristics of subjects.

	Referred N = 82		Not Referred N = 82	
Age, yrs	<i>Mean (SD)</i>		<i>Mean (SD)</i>	
	48.4 (17.4)*		54.2 (17.7)*	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Gender				
Female	69	84.1	64	78.0
Male	13	15.9	18	22.0
Race				
White	70	85.4	69	84.1
Black or African American	3	3.7	0	0.0
Asian, Native Hawaiian, or Other Pacific Islander	5	6.1	6	7.3
American Indian or Alaska Native	0	0.0	1	1.2
Other	1	1.2	1	1.2
Two or more races	2	2.4	2	2.4
Unanswered	1	1.2	3	3.7
Ethnicity				
Hispanic or Latinx	2	2.4	7	8.5
Not Hispanic or Latinx	36	43.9	36	43.9
Unanswered	44	53.7	39	47.6

	Referred N = 82		Not Referred N = 82	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Marital status				
Married	49	59.8	55	67.1
Never Married	19	23.2	15	18.3
Other	13	15.9	10	12.2
Unanswered	1	1.2	2	2.4
Education level, years completed*				
12 or less	3	3.7	12	14.6
13-16	34	41.5	20	24.4
17 or more	24	29.3	19	23.2
Unanswered	21	25.6	31	37.8
Occupation				
Employed	47	57.3	43	52.4
Retired	17	20.7	23	28.0
Unemployed	2	2.4	3	3.7
Other	12	14.6	10	12.2
Unanswered	4	4.9	3	3.7
Insurance status				
Medicaid or Medicare	5	6.1	5	6.1
Private	74	90.2	72	87.8
Self/uninsured	3	3.7	5	6.1
Distance from clinic, miles				
10 or less	30	36.6	17	20.7
>10 to 20	18	22.0	19	23.2
>20 to 40	18	22.0	21	25.6
>40 to 100	7	8.5	14	17.1
>100	9	11.0	11	13.4
	Median (IQR)		Median (IQR)	
	14.2 (7.1–14.2)*		22.6 (13.2–58.9)*	

* Significant at P < 0.05.

3.2 CLINICAL VARIABLES

The duration of the chief complaint reported at the subject’s initial visit did not differ between the two groups, with a median of 2.0 years (IQR, 0.5 to 9.0) for the Referred group and 2.0 years (IQR, 0.5 to 8.8) for the Not Referred group. Subjects reported their present, average, and worst pain scores verbally using a 0-10 scale at each visit, which are given in **Table 2**. There was a considerable amount of missing data as many providers often utilized just one or two of the measures to assess the subject’s pain, with present pain being the score most commonly used. The present pain score at the referral/match visit was significantly different with Referred subjects having a mean score of 4.5 (SD, 2.6) and Not Referred subjects having a lower score of 3.0 (SD, 2.5) on a 0-10 scale (P = 0.006). Otherwise, there was little difference between the groups according to their pain scores, for either the initial or subsequent (referral or match) visits.

Table 2 – Pain scores collected at the initial visit and the referral/match visit.

Referred			Not Referred		
<i>Mean (SD)</i>			<i>Mean (SD)</i>		
Initial visit			Initial visit		
	Present	4.5 (2.5)		Present	3.8 (2.5)
	Average	5.0 (2.4)		Average	5.4 (2.4)
	Worst	6.9 (2.5)		Worst	6.7 (2.8)
Referral visit			Match visit		
	Present*	4.5 (2.6)		Present*	3.0 (2.5)
	Average	4.7 (2.6)		Average	3.6 (3.0)
	Worst	6.2 (2.9)		Worst	5.6 (3.6)

* Significant at P < 0.01.

Subjects reported present, average, and worst pain intensities verbally using a 0-10 scale.

Historically, the clinic utilized two different intake questionnaires, one given to patients with primarily pain complaints and the other given to patients with primarily mucosal or salivary complaints. The Graded Chronic Pain Scale (GCPS) questions were included only in the pain questionnaire. Out of our study population, 115 subjects were provided this pain questionnaire at their initial visit, while the remaining 49 subjects completed the mucosal/salivary questionnaire. The scoring of a subject's Graded Chronic Pain (described in detail in **Figure 3** in the **Appendix**) requires the following variables:

1. *Characteristic pain intensity (CPI)* which is the average of the present pain score, the average pain score for the past six months, and the worst pain score for the past six months, all given on a 0-10 scale.
2. *Disability days (DD)* which are the number of days in the last six months (max 180 days) that the subject reports being kept from their usual activities because of facial pain.
3. *Disability score* which is the average of three interference scores (on a 0-10 scale) that relate how much facial pain has interfered in the past six months with the patient's "daily activities," "recreational, social and family activities," and "ability to work."

However, among the 115 subjects provided with the pain questionnaire, many did not complete enough of the questions required to calculate the GCPS. Therefore, in addition to the overall GCPS scores given in **Table 3**, scores for the three constituent measures described above are also included as many more subjects completed at least the one question for *disability days* or three questions for either the *CPI* or the *disability score*. While the mean *CPI* was the same (5.5) for both Referred and Not Referred groups, it appeared that the Referred group had a higher degree of facial pain-related disability and interference when compared to the Not Referred group. Specifically, the Referred group experienced a higher number of *disability days* with a median of 20 (IQR, 0 to 55) days compared to 1.5 (IQR, 0 to 33) days in the Not Referred group ($P = 0.086$). The mean *disability score* for Referred subjects was also somewhat more elevated by comparison ($P = 0.12$). This trend is reflected when comparing the overall GCPS scores of

each group. The Referred group had a greater percentage of subjects with Grade III or IV pain (82.9%) compared to those Not Referred (64.3%), indicating more moderate and severe pain-related disability. Whereas the Not Referred group had a greater percentage of subjects with Grade I or II pain (35.7%) compared to those Referred (17.1%) indicated more low pain-related disability (with either low or high pain intensity).

Table 3 – Graded Chronic Pain Scale scores with the 3 constituent measures.

		Referred		Not Referred	
		<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Graded Chronic Pain Score¹ (<i>N</i> = 69)	0	0	0.0	0	0.0
	I	3	7.3	3	10.7
	II	4	9.8	7	25.0
	III	16	39.0	8	28.6
	IV	18	43.9	10	35.7
Characteristic Pain Intensity (<i>N</i> = 48)		Mean (SD)		Mean (SD)	
		5.5 (2.2)		5.5 (2.3)	
Disability Days (<i>N</i> = 101)		Median (IQR)		Median (IQR)	
		20.0 (0.0–55.0)		1.5 (0.0–33.0)	
Disability Score (<i>N</i> = 105)		Mean (SD)		Mean (SD)	
		4.6 (2.9)		3.6 (3.2)	

¹Graded Chronic Pain Scores:

- I – low pain intensity, low pain-related disability
- II – high pain intensity, low pain-related disability
- III – moderate pain-related disability
- IV – severe pain-related disability

Table 4 includes painful symptoms that subjects were able to select from a list of medical symptoms within their initial questionnaires. This variable was included to help provide a more global picture of pain experienced by subjects. While the results do not show a significant difference between the two groups either by type of pains or number of pain symptoms, they do

highlight the significant co-morbidities between orofacial pain and other bodily pains. Head and neck pain was endorsed by 101 of the 164 total subjects and musculoskeletal pain was endorsed by 86 of the 164 total subjects. Additionally, a substantial number of subjects (N = 62) endorsed back/shoulder pain which was included under the “other” pain category.

Table 4 – Painful symptoms endorsed on intake questionnaire.

Type of Pain	Referred		Not Referred	
	<i>N</i>	%	<i>N</i>	%
Ear, Eyes, Nose, Throat ¹	26	31.7	33	40.2
Head and Neck ²	52	63.4	49	59.8
Cardiovascular ³	7	8.5	5	6.1
Musculoskeletal ⁴	41	50.0	45	54.9
Other ⁵	38	46.3	36	43.9
Number of painful symptoms (out of 11)	<i>Mean (SD)</i>			
	2.73 (2.15)		2.88 (2.49)	

¹Includes earaches, eye pain, and sore throat.

²Includes headaches and neck pain.

³Includes chest pain.

⁴Includes muscle aching/cramping and joint aching/pain.

⁵Includes back/shoulder pain, abdominal pain, and skin burning.

We also assessed what medical conditions the subjects endorsed from the list included in the intake questionnaire at their initial visit. The medical conditions served as a surrogate measure of general medical status by which to compare the two groups. Medical conditions were grouped according to body system (e.g. cardiovascular, respiratory, etc.) to allow for analysis (**Table 5** in the **Appendix**). There were no significant differences between Referred and Not Referred subjects for any of the medical condition groups. However, a difference in the prevalence of trauma (fractures, concussions, injury to face/jaw/neck) between the two groups approached significance ($P = 0.051$) with the Not Referred group having a higher percentage of trauma (N = 59, 72.0%) compared to the Referred group (N = 46, 56.1%). Interestingly, Referred and Not

Referred subjects showed very little difference in prevalence rates for the two most relevant categories (i.e. pain and psychological) to this study.

Table 6 – Total number of oral medicine visits completed at referral/match visit and duration of time between the initial visit and referral/match visit.

	Referred <i>Median (IQR)</i>	Not Referred <i>Median (IQR)</i>	
Completed visits	3 (1–6)*	<i>Unmatched time interval</i> 3 (1–6)	<i>Matched time interval</i> 1 (1–2)*
Time between initial and referral/match visit, months	4.0 (0.0–23.4)	8.8 (0.0–35.6)	

* Significant at P < 0.01.

A comparison of the number of completed treatment visits is shown in **Table 6**. The total number of completed oral medicine visits was recorded for each subject from the initial visit up to and including the subsequent referral/match visit. The primary purpose of this variable was to determine if the Referred subjects had relatively fewer or greater visits by the time of referral compared to the Not Referred subjects. Inherently, there is little meaning to the number of visits completed by the Not Referred at the time of their match visit (*unmatched time interval* in **Table 6**), as this is an arbitrary time interval when applied only to these subjects. Therefore, to compensate for this, an additional measure was created by capturing the time interval of the Referred subject with whom the Not Referred subject was paired and determining how many visits the Not Referred subject completed during this identical time interval (*matched time interval* in **Table 6**). This comparison revealed that the Referred subjects completed significantly more visits during an identical time interval than the Not Referred subjects

($P < 0.001$). The time between visits was similarly subject to significant variation as a Not Referred subject could have initiated treatment well before or after the Referred subject with whom they were paired. Therefore, the time variable was included only to provide context for the completed visits variable.

Table 7 – Oral medicine diagnoses documented at the referral/match visit, by category.

	Referred		Not Referred	
	<i>N</i>	%	<i>N</i>	%
TMD	49	59.8	38	46.3
Headache	26	31.7	16	19.5
Neuropathic	37	45.1	34	41.5
Mucosal	10	12.2	21	25.6
Salivary	4	4.9	9	11.0
Movement Disorder	2	2.4	2	2.4
Bone	2	2.4	2	2.4
Odontogenic	1	1.2	1	1.2
Other¹	8	9.8	13	15.9

¹Includes neck pain; tongue habits; sleep apnea; and central nervous system, ear, sinus, thyroid, dermal, and occlusal conditions.
TMD = temporomandibular disorder

Oral medicine diagnoses were extracted from chart notes for the referral/match visits. The most prevalent condition types among the total population were TMD, headaches, and neuropathic conditions with the complete breakdown given in **Table 7**. The most common diagnoses were myalgia (associated with TMD), unspecified headache, and trigeminal neuropathic pain. Of note, many subjects had multiple diagnoses within a category as well as diagnoses from different categories. The two groups did not significantly differ with respect to the types of oral medicine

conditions they had. However, there were higher percentages of commonly painful conditions (e.g. TMD, headache, neuropathy) within the Referred group compared to the Not Referred group. A similar trend was observed for the mucosal and salivary categories, which were more common in the Not Referred group compared to the Referred group. Interestingly, many conditions typically thought of as non-painful (e.g. salivary and movement disorders) were observed in both groups of subjects, all of whom reported orofacial pain at their initial visit. The complete list of specific oral medicine diagnoses is given in **Table 13** in the **Appendix**.

3.3 PSYCHOLOGICAL VARIABLES

The primary aim of this study was to assess psychological differences between the Referred subjects and the Not Referred subjects, using results from the SCL-90R as the primary outcome measure (**Table 8**). The SCL-90R was administered to subjects at their initial visit as a measure of psychosocial distress. Providers were then able to use the subject's responses to calculate whether they fell into the normal, moderate, or severe range of anxiety, depression, somatization, and somatization without pain. A comparison of the two groups using the Chi-square test showed significant differences between the groups' anxiety ($P = 0.012$) and depression ($P = 0.023$) measures. Logistic regression modeling using Normal as the reference category showed Referred subjects were significantly more likely to have moderate/severe anxiety and depression. The unadjusted odds ratios (ORs, 95% confidence interval [CI]; P value) of moderate and severe anxiety and moderate and severe depression for the Referred group were 2.09 (0.97 to 4.60; $P = 0.064$), 4.76 (1.56 to 17.90; $P = 0.010$), 1.03 (0.44 to 2.40; $P = 0.94$), and 2.79 (1.27 to 6.30; $P = 0.012$), respectively. An additional logistic regression model adjusting for age, gender, race/ethnicity, insurance status, and driving distance revealed similar results, aside from moderate anxiety reaching significance. The adjusted ORs (95% CI; P value) of moderate and severe anxiety and moderate and severe depression for the Referred group were 2.60 (1.08 to 6.50; $P = 0.037$), 5.50 (1.65 to 22.60; $P = 0.009$), 0.94 (0.38 to 2.30; $P =$

0.90), and 3.10 (1.30 to 7.80; $P = 0.013$), respectively. While the groups did not significantly differ with respect to somatization measures, the highest percentage of the Referred group's subjects fell into the severe range for both somatization categories and had higher percentages in the severe range compared the Not Referred group.

(Table 8 shown on the next page)

Table 8 - Symptom Checklist-90R with anxiety, depression, somatization, and somatization without pain measures

	Referred		Not Referred		Unadjusted Odds Ratio ¹ (95% CI)	P value	Adjusted Odds Ratio ^{1,2} (95% CI)	P value
	N	%	N	%				
Anxiety						0.009**		0.006**
Normal	36	49.3	49	72.1				
Moderate	23	31.5	15	22.1	2.09 (0.97-4.60)	0.064	2.60 (1.08-6.50)	0.037*
Severe	14	19.2	4	5.9	4.76 (1.56-17.90)	0.010*	5.50 (1.65-22.60)	0.009**
Depression						0.022*		0.018*
Normal	26	35.6	34	50.0				
Moderate	15	20.5	19	27.9	1.03 (0.44-2.40)	0.941	0.94 (0.38-2.30)	0.899
Severe	32	43.8	15	22.1	2.79 (1.27-6.30)	0.012*	3.10 (1.30-7.80)	0.012*
Somatization						0.240		0.345
Normal	21	28.8	25	36.8				
Moderate	23	31.5	25	36.8	1.10 (0.49-2.50)	0.826	1.10 (0.46-2.70)	0.835
Severe	29	39.7	18	26.5	1.92 (0.85-4.40)	0.122	1.86 (0.75-4.70)	0.182
Somatization without pain						0.064		0.105
Normal	29	39.7	32	47.1				
Moderate	15	20.5	21	30.9	0.79 (0.34-1.80)	0.575	0.88 (0.35-2.20)	0.788
Severe	29	39.7	15	22.1	2.13 (0.97-4.80)	0.064	2.23 (0.92-5.60)	0.080

* Significant at P < 0.05, ** Significant at P < 0.01.

¹Normal is the reference category.

²Logistic regression model adjusted for age, gender, race/ethnicity (non-Hispanic white versus other), insurance status, and driving distance.

In addition to the SCL-90R results, psychiatric conditions and medications were used to provide additional insight into the subject’s present or past history of psychiatric conditions and psychiatric medication use. This information was extracted from the intake questionnaire medical history and chart notes from both the initial and referral/match visits. Psychiatric conditions were classified into the following categories of disorders: anxiety, mood, psychotic, neurodevelopmental, neurocognitive, eating, substance use, and other. **Table 9** provides the prevalence of psychiatric conditions according to these categories, with conditions not classified as anxiety or mood being combined together in the “other” group. Among the Referred subjects, over half (N = 47, 57.3%) had a type of anxiety disorder and half (N = 41, 50.0%) had a type of mood disorder, with unspecified anxiety and depression being the most common, respectively. By comparison, over half (N = 42, 51.2%) of the Not Referred subjects also had a type of anxiety disorder and nearly a third (N = 26, 31.7%) had a type of mood disorder, again with unspecified anxiety and depression being the most common, respectively. The specific disorders within each category are provided in **Table 14** in the **Appendix**. The Referred group included a significantly higher percentage of subjects with a mood disorder compared to the Not Referred group (P = 0.017). There were no other significant differences in psychiatric conditions observed between the two groups.

Table 9 – The prevalence and type of psychiatric conditions, by category.

	Referred		Not Referred	
	<i>N</i>	%	<i>N</i>	%
Anxiety	47	57.3	42	51.2
Mood	41*	50.0	26*	31.7
Other¹	3	3.6	3	3.6

* Significant at P < 0.05.

¹Includes neurodevelopmental, substance use, and personality disorders.

While the two groups differed somewhat in prevalence of psychiatric conditions, they interestingly did not continue to have the same pattern with regard to psychiatric medication use. There were no significant differences between Referred and Not Referred subjects for any of the categories of psychiatric medications shown in **Table 10**, but rather were nearly identical. The specific medications used are given in **Table 15** in the **Appendix**. The most common class of psychiatric medication used was antidepressants (Referred: N = 28, 34.1%; Not Referred: N = 32, 39.0%) followed by anxiolytics (Referred: N = 21, 25.6%; Not Referred: N = 19, 23.2%), with amitriptyline and clonazepam being the most common medications. It should be noted that clonazepam and amitriptyline are potential therapies for burning mouth syndrome and chronic orofacial pain, respectively, which are two common conditions treated in the OMCS clinic. However, even after excluding them, the groups follow the same trend for the remaining psychiatric medications. Several subjects were also noted to be using more than one medication of the same type or more than one class of medications.

Table 10 – The prevalence of psychiatric medication use divided by drug class.

	Referred		Not Referred	
	<i>N</i>	%	<i>N</i>	%
Anxiolytic	21	25.6	19	23.2
Antidepressant	28	34.1	32	39.0
Antipsychotic	1	1.2	0	0.0
Mood stabilizer	2	2.4	2	2.4
Stimulant	1	1.2	1	1.2

Table 11 gives the number of visits that the Referred subjects (N = 82) completed with one of the OMCS psychologists following their referral to the psychology service. A total of 58 Referred subjects (70.7%) completed at least one psychology visit, with the total number of visits ranging

from zero to 147 with a median of one visit (IQR, 0 to 3). The overwhelming majority (94.8%) of the 58 subjects who completed at least one psychology visit, completed all their psychology visits within the first 12 months after referral. Subjects most commonly completed one to two visits (N = 34, 41.5%) with only a few subjects (N = 13, 15.9%) completing five or more visits.

Table 11 – Number of visits that Referred subjects completed with an OMCS psychologist following their psychology referral.

# Visits	N	%
0	24	29.3
1	21	25.6
2	13	15.9
3	6	7.3
4	5	6.1
5	3	3.7
6	3	3.7
7	2	2.4
9	1	1.2
10	1	1.2
13	1	1.2
32	1	1.2
147	1	1.2

3.4 OMCS PROVIDER SURVEY

The optional online survey sent to OMCS providers had a 100% response rate (N = 8). The survey is included in its entirety in **Figure 5** in the **Appendix**. The intention of Section 1 of the survey was to assess the importance that providers place on the various patient factors and clinical scenarios listed. The responses for Section 1 are reported in **Figures 1A and 1B**. The providers endorsed that they “often/always” factor 13 of the 26 listed patient factors and clinical scenarios into their decision to refer or not refer a patient to the OMCS psychology service. These variables had a few common themes among them. First, a common consideration was

how likely the patient is to follow up on the referral, both in terms of patient acceptability of the referral as well as their ability to access the clinic with ease. Second, as expected, there is often a consideration of any diagnosed mental disorders and the degree to which they are managed or controlled. Third, any evidence of an undiagnosed mental disorder or psychosocial distress is of particular importance to the provider. The only variable for which there was consensus among all eight providers was “current suicide ideation,” for which they all reported they would “often/always” factor it in their decision to refer or not refer. Last, there is special attention given to any mental illness that the patient or provider feels may be contributing to the chief complaint or interfering with the patient’s ability to manage their condition and function. Three providers wrote in the following additional factors:

- “If the patient believes their condition is responsible for their stress/anxiety/depression/etc. If the patient speaks English. If the patient is happy with the current management of their mental disorder.”
- “Past experience with counseling was positive.”
- “Patient not wanting to be identified as having ‘emotional problems.’ This is a patient limitation which may increase anxiety.”

The aim of Section 2 was simply to determine which of these same factors providers most often encounter in their daily practice in OMCS. **Table 12** includes the factors that were selected by the most providers. The number of factors selected by the providers ranged from 3 to 19, with the majority selecting 3-5 factors. Two providers wrote in the following additional factors, which indicate that financial barriers are frequently encountered:

- “Lack of insurance coverage, and distance from the clinic.”
- “Financial support for the visits.”

The answers given in Section 2 share the same common themes described above. Furthermore, the findings from the provider survey appear to align with many of the results from the case-control portion of the study. Specifically, providers frequently consider any barriers the patient

may have to accessing the clinic, which is reflected in the fact that the Referred subjects live significantly closer to the OMCS clinic. The survey also emphasizes the consideration of mental disorders and any signs of mental illness, which corresponds to the significantly higher prevalence of mood disorders and psychosocial distress (as measured by the SCL-90R) observed in the Referred group.

Table 12 –OMCS provider responses to the following Section 2 survey prompt:

“In your daily practice in OMCS, please select the factors you feel MOST COMMONLY impact your decision when considering a patient referral to the OMCS psychologist.”

Patient Factor or Clinical Scenario¹	Respondents <i>N (out of 8)</i>
Barriers to accessing clinic	5
Patient's receptiveness to psychology referral	5
Mental illness contributing to chief complaint	5
Diagnosed mental disorder with no current professional management	4
Current suicide ideation	4
Financial barriers to treatment	3
Diagnosed mental disorder inadequately controlled or managed	3
Suspect undiagnosed mental disorder	3
Mental illness interfering with treatment adherence/management	3
High levels of stress	3

¹Variables receiving 2 or fewer responses not listed.

Figures 1A, 1B – OMCS provider responses to the following Section 1 survey

prompt: “Several factors and clinical scenarios are listed below. Rate each factor/scenario individually, as opposed to rating them relative to each other. Assuming each factor applies to a hypothetical patient, please select how often you would factor it in to your decision to refer or not refer the patient to the OMCS psychologist.”

(Figures 1A, 1B shown on the next two pages)

Figure 1A

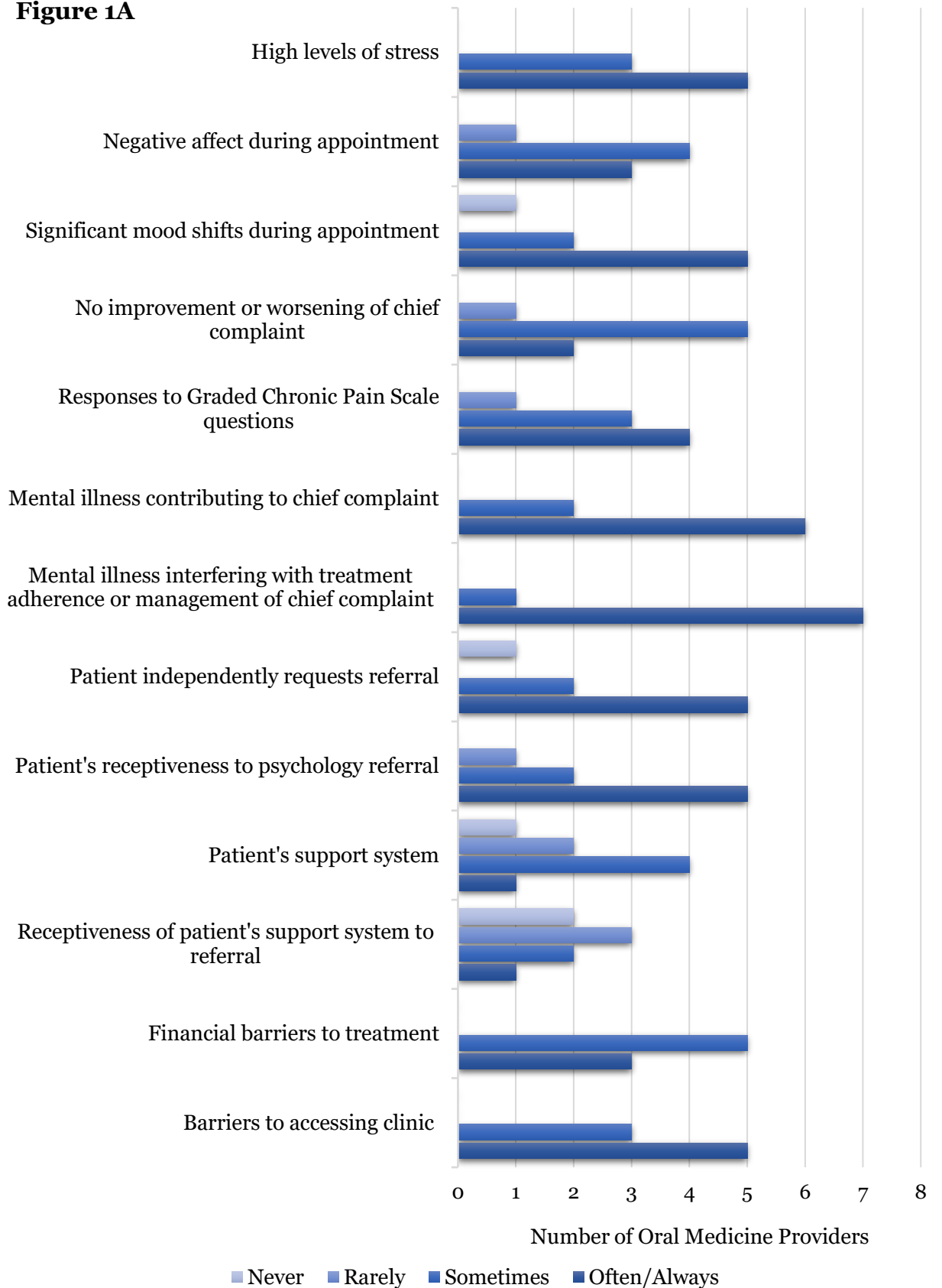
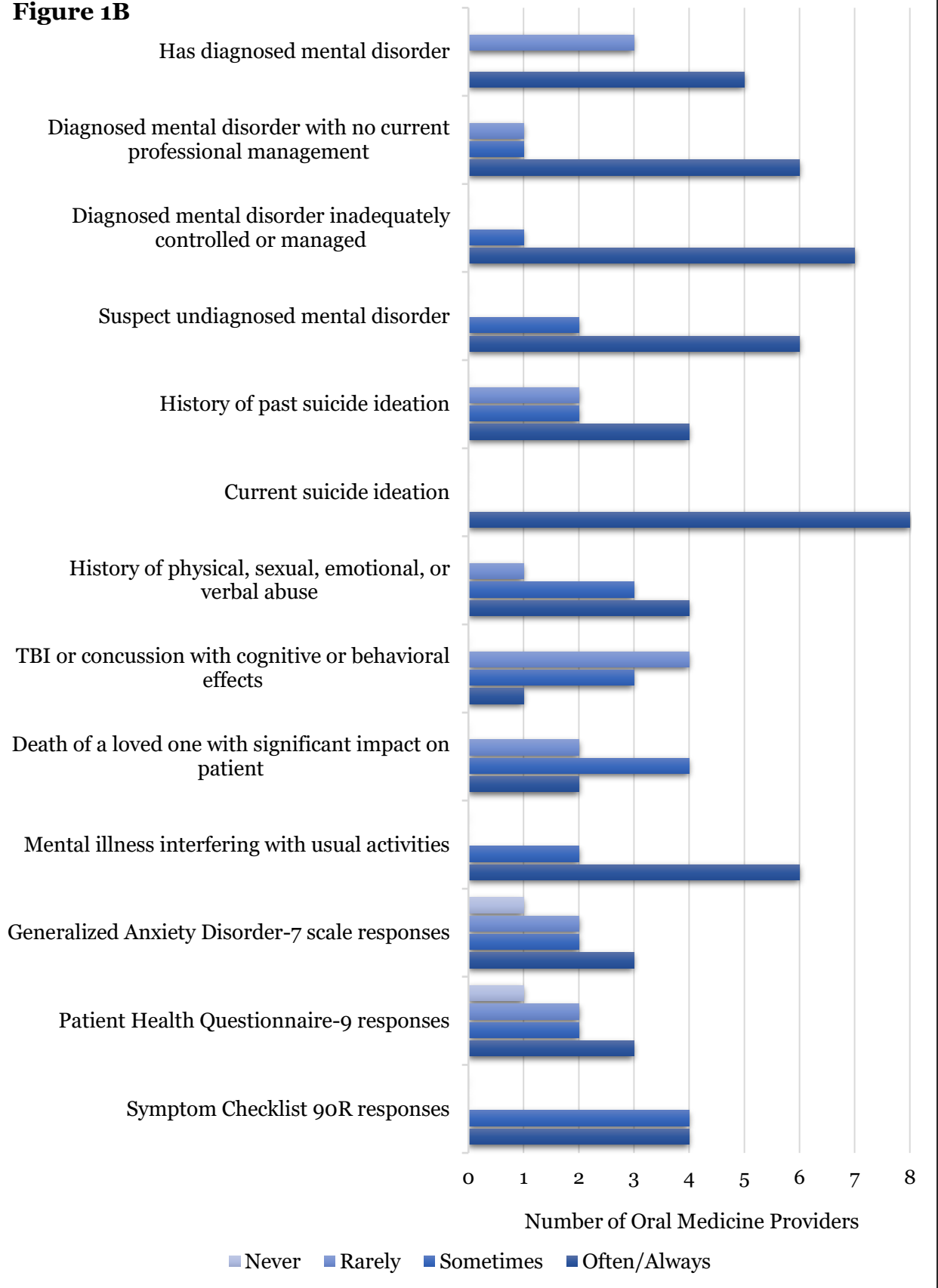


Figure 1B



CHAPTER FOUR

DISCUSSION

The University of Washington Oral Medicine Clinic has provided an internal psychology service to its patients for the last twenty years. However, an in-depth analysis of this service and the patients referred to it had not been conducted prior to this study. The purpose of this study was to characterize the population of patients with orofacial pain who were referred to the internal psychology service within the OMCS clinic, with a particular focus on measures of psychosocial distress and mental health. A retrospective case-control study using patient EHR was conducted to accomplish this goal.

4.1 DEMOGRAPHIC VARIABLES

The majority of the overall study population was white (84.8%) and female (81.1%) with no significant differences between the study groups. The demographic characteristics of this study population are comparable to those described in a previous American Academy of Oral Medicine (AAOM) report that characterized patients of oral medicine practices in the U.S. and Canada.²⁵ The higher prevalence of female patients among this population with orofacial pain could be due to gender differences in the utilization of healthcare²⁷⁻²⁹ or due to the fact that many of the conditions encountered in the OMCS clinic, such as TMD, migraine, and BMS are more prevalent among women.³⁰⁻³² The Not Referred subjects were significantly older than the Referred subjects with mean ages of 54.2 (SD, 17.7) years and 48.4 (SD, 17.4) years, respectively. Age has been shown to be an important factor in healthcare-seeking behavior for mental health concerns, with younger patients more likely to seek care than older patients.²⁹ To our surprise, no significant differences were found between the groups with respect to insurance status, as approximately 90% of the subjects had private insurance. However, specific insurance plan features (e.g. provider in- or out-of-network, deductible, treatments covered) can still have a

significant impact on a patient's overall financial burden. While those factors may have impacted the subject's referral status, they were beyond the scope of this study. On the other hand, the travel distance to the clinic significantly differed between the groups, with the Referred group residing closer to the clinic, on average. The limited access to oral medicine services is reflected in the long distances many patients travel to see OMCS providers. In this study population, a quarter of the subjects were calculated as living over 40 miles from the clinic, many of whom lived over 100 miles away across Washington or in other states. The study confirmed our expectation that travel burden plays an important role in whether or not subjects are referred to the OMCS psychology service.

4.2 CLINICAL VARIABLES

Several clinical variables assessed in this study were included to assess if Referred subjects had any significant differences in the chronicity, intensity, or extent of their pain. We expected Referred subjects to report, on average, a longer duration of their chief complaint as a potential indicator of more chronic pain, which is commonly associated with Axis II factors.^{15,33,34} Instead, the groups both reported a median duration of 2.0 years at the time of their initial visit.

However, this measure is prone to wide interpretation by patients and may not accurately represent the chronicity of the chief complaint. For instance, a patient may report five years to indicate how long they have experienced consistent or constant symptoms and another patient may report five years to indicate the first time they experienced symptoms that were short-lived and are only recently reoccurring. Pain scores reported by subjects at their initial visit and the subsequent referral/match visit also showed little variation, with the exception of the present pain score at the referral/match visit. Referred subjects, on average, reported a higher present pain score at that visit than was reported by Not Referred subjects ($P = 0.006$). A reasonable conclusion could be made that a higher pain intensity reported at a subsequent visit may encourage the treating provider to consider additional complementary therapy, such as

professional psychological treatment. Overall, however, there was not a strong trend toward Referred subjects reporting higher pain intensities, and the amount of missing data for this variable should also be taken into consideration. We also considered how a subject's overall pain experience may impact their referral status. Therefore, responses to the list of painful symptoms included in the initial questionnaire were used to determine the number and type of bodily pains experienced by subjects. Similar to the pain scores measuring orofacial pain, there were no significant differences between the groups with respect to either the number or type of painful symptoms. On the other hand, there were significant co-morbidities between orofacial pain and other bodily pains among the study population as a whole. Head and neck pain as well as musculoskeletal pain were endorsed by over half of the subjects, while over a third of the subjects endorsed back/shoulder pain. This is of particular importance since studies have shown a strong association between the presence of multi-site pain and mental disorders such as anxiety and depression.^{14,35} In terms of referral status, pain-related disability and interference as measured by the GCPS appeared to be of greater importance than simply the presence or intensity of pain. Although, the difference in GCPS scores between the two groups did not reach the level of significance, a clear trend toward moderate and severe pain-related disability was observed for the Referred group, whereas the Not Referred group had a trend toward low pain-related disability. These trends appeared to be primarily related to the higher number of *disability days* and higher *disability scores* observed for Referred subjects, rather than their *CPI*. Previous research by Dworkin et al. found that patients with heightened psychosocial disability (i.e. GCP score of II-high pain intensity, III, or IV) had a reduction in pain-related interference associated with their TMD condition when CBT was combined with usual conservative treatment.²¹ This finding may explain the higher GCPS scores observed among the Referred subjects in our study since the OMCS providers may have been trying to similarly improve treatment outcomes by offering a referral for CBT to patients exhibiting elevated psychosocial disability. It should be noted that GCPS questions were only included in the initial

questionnaire given to patients with primarily pain complaints and not in the questionnaire given to those with mucosal or salivary complaints. This constraint coupled with some incomplete responses from those who did receive the pain questionnaire reduced the sample size for this variable. The last element of the subject's clinical presentation that we examined was the oral medicine diagnoses for which they were being treated. The most prevalent condition types among the total population were TMD, neuropathic conditions, and headaches, respectively. The oral medicine conditions diagnosed among this population are similar to those described in studies that characterized other oral medicine clinics.^{24-26,36} The most commonly encountered orofacial pain conditions among these clinics were likewise TMD followed by neuropathic pain and headaches, however the clinics varied in whether mucosal or pain conditions were the overall majority of conditions treated. Contrary to our expectations, the type of oral medicine conditions or specific diagnoses being treated by the OMCS providers did not appear to play a significant role in referral decisions. While Referred subjects had a higher percentage of commonly painful conditions (e.g. TMD, headache, neuropathy) and a lower percentage of mucosal and salivary conditions, there were no statistically significant differences between the groups. Interestingly, many conditions typically thought of as non-painful (e.g. many mucosal, salivary, and movement disorders) were well-represented among this population composed entirely of subjects with orofacial pain. The lack of any stark differences in oral medicine diagnoses between the Referred and Not Referred groups may indicate that providers focus more on assessing an individual's level of overall disability, life interference, and distress and less on whether or not their condition is commonly associated with severe pain and suffering (e.g. trigeminal neuralgia branded the "suicide disease").

4.3 PSYCHOLOGICAL VARIABLES

Since the study was intended to study an internal psychology service within an oral medicine clinic, the primary aim was to determine if there were differences in psychological measures

between subjects referred to the service compared to those who were not. Algorithm diagnoses of anxiety, depression, somatization, and somatization without pain as measured by the SCL-90R were the primary outcomes. The prevalence and types of psychiatric conditions and medications used by subjects were secondary outcomes that were included to further illustrate the mental health of the subjects. The adjusted ORs (95% CI; P value) of moderate and severe anxiety and moderate and severe depression for the Referred group were 2.60 (1.08 to 6.50; P = 0.037), 5.50 (1.65 to 22.60; P = 0.009), 0.94 (0.38 to 2.30; P = 0.90), and 3.10 (1.30 to 7.80; P = 0.013), respectively. Somatization and somatization without pain did not significantly differ between Referred and Not Referred subjects, perhaps because the subjects all shared a complaint of some type of pain or perhaps because the OMCS providers feel more confident in treating patients with elevated somatization without additional support. We expected the SCL-90R measures to portray a greater amount of psychosocial distress for the Referred subjects since intuitively providers would be more likely to refer patients displaying signs of mental illness, either with their SCL-90R responses and/or their clinical presentation. The same trend was not, however, observed for the prevalence of psychiatric conditions and medication use. With the exception of mood disorders being significantly more prevalent among Referred subjects, there were no other statistically significant differences between the groups. This could be interpreted to mean that providers are more sensitive to signs of psychosocial distress rather than psychiatric diagnoses since the presence or lack of a mental disorder is not representative of a patient's current mental health status. This theory may also explain why there was very little difference between the groups with respect to the use or type of psychiatric medications, again because the use of medications does not indicate the degree to which the condition being treated is controlled. As previously noted, the two drugs clonazepam and amitriptyline that were used by many of the subjects are potential therapies for BMS and chronic orofacial pain, respectively, which are two conditions commonly treated in the OMCS clinic. However, even after excluding clonazepam and amitriptyline, there were still 36 instances of subjects using a different

anxiolytic and 59 instances using a different antidepressant among the total study population (N = 164). While the study confirmed some of the expected differences between the groups, such as a higher prevalence of mood disorders and psychosocial distress among Referred subjects, it is important to point out that the Not Referred group also included a large number of subjects with moderate to severe levels of anxiety (28.0%) and depression (50.0%). The prevalence of anxiety and depression in this study population is much higher than the prevalence observed in the general U.S. population where approximately one in five adults experience mental illness, 18.1% of adults live with anxiety disorders, and 6.9% of adults live with major depression.¹⁰ Females have been consistently shown to have significantly higher rates of anxiety and depression when compared to men.^{37,38} While the majority of our study subjects were female, the gender differences in prevalence rates reported in the literature do not seem to entirely account for the discrepancy we observed between our orofacial pain subjects and the general U.S. population. These results highlight the importance of screening for psychosocial issues, using validated instruments to assess patients over time, and ensuring that all contributing factors of a patient's complaint are being addressed.

4.4 OMCS PROVIDER SURVEY

The OMCS provider survey was created for this study to help assess additional factors that impact whether or not particular patients are referred to the internal psychology service yet may not be discoverable through patient chart records alone. For instance, a patient's affect during appointments or how much of a support system the patient has may play important roles in the decision-making process or the discussion of a referral yet can be difficult to assess through chart records only. Therefore, we surveyed eight OMCS oral medicine specialists regarding their opinions on a broad range of patient factors and clinical scenarios to provide more insight into when and why patients are referred to the OMCS psychology service. The factors most commonly selected by providers seemed to agree with the results of the retrospective case-

control portion of the study. First, the survey results indicated that the provider frequently assesses how likely the patient is to follow up on a referral, both in terms of patient acceptability of the referral as well as their ability to access treatment. This was reflected in the finding that Referred subjects, on average, lived closer to the OMCS clinic. Second, as one would expect, providers are attuned to any diagnosed mental disorders the patient may have and if patients are receiving treatment for them. While Referred subjects had a significantly higher prevalence of mood disorders, the survey results appeared to support that the impact of mental illness was more important. This is evidenced by the significantly higher levels of psychosocial distress, particularly anxiety and depression, among Referred subjects as measured by the SCL-90R. Finally, the survey showed that the importance providers place on pain-related disability and interference was similarly reflected in the results of the chart review that showed Referred subjects suffered from higher pain-related disability as measured by the GCPS. This is in contrast to the relatively similar pain intensity scores reported by Referred and Not Referred subjects.

4.5 STUDY LIMITATIONS

The study had the standard limitations of a retrospective study in that some variables were not standardized which thus resulted in missing data. For example, providers varied in which pain scores (present, average, worst) they collected. Additionally, since the information was not originally collected for research purposes, many of the open-ended responses and freely written information had to be categorized to allow for consistency throughout the data collection. The sample size was limited by the fact that we were unable to include subjects from the earlier years of the OMCS psychology service because EHR was not adopted until 2009, many years after the service began. Some potential subjects (N = 21) who had their first psychology visit within the study period still had to be excluded because their initial and/or referral match visits were completed prior to July 1, 2009 so data required for the study was inaccessible. The sample size

was also impacted by variations in the referral process from oral medicine specialist to psychologist; therefore, the number of patients referred to the psychologist during the study period likely exceeds the number in our study population. There were also a small number of potential subjects (N = 8) who were referred but were excluded due to no report of pain at their initial visit, again highlighting the fact that not all of the patients referred to the psychology service have pain. We were aware at the start of the study that we may be missing relevant details of the psychological variables. Specifically, information regarding psychological histories and diagnoses may not be disclosed by the patient or may be incomplete. Also, we were not able to assess if the subjects with a diagnosed mental disorder were already under treatment with another psychologist or mental health professional. As we discussed in the previous section, a patient could be taking a psychiatric medication for an indication other than psychiatric dysfunction (e.g. neuropathic pain). Finally, we were not able to detect potential fluctuations in GCPS and SCL-90R responses because those instruments were generally completed only at initial visits. Therefore, the scores may not completely reflect the status of a patient if their visits spanned several years. Other variables subject to fluctuation were the patient's insurance information and ZIP Code. We were restricted to using the current information in the patient's EHR, which may have differed from the insurance and residence they had at their initial and referral/match visits.

4.6 STUDY STRENGTHS

The biggest strength of the study is that, to our knowledge, it is the first study to characterize a psychology service within an oral medicine clinic. The University of Washington OMCS was a particularly appropriate setting for this study because its scope includes essentially all oral medicine conditions, thus our study population included subjects with orofacial pain associated with a diverse range of conditions. We were also able to have a relatively long study period of nearly eight years, despite the limitations described above. Finally, the combination of the

retrospective case-control study to evaluate patient factors and the prospective survey to evaluate provider factors offered a uniquely comprehensive analysis of when and why patients would be referred to an internal psychology service within a clinic that frequently treats patients with orofacial pain.

4.7 FUTURE DIRECTIONS

The findings from this study could benefit patients, providers, and the OMCS clinic in general. We have shown many significant factors that historically differentiated Referred subjects from Not Referred. The summarization of those factors may help providers to become conscious of their past behavior with regard to psychology referrals. The referral process could then be expedited if providers could recognize factors and clinical scenarios that historically warranted a referral thereby allowing them to identify those patients and execute a referral (that would typically take place) earlier in the course of treatment. Furthermore, the study also characterized a diverse group of patients with orofacial pain who were never referred to OMCS psychology. We highlighted variables and patient scenarios among this group that would reasonably warrant a referral yet may have been inadvertently overlooked. One may conclude from the results of this study that the OMCS psychology service has been underutilized, however the findings may also serve to remind providers of this valuable resource. A proposed reference standard (**Figure 6** in the **Appendix**) was created that may provide a starting point to guide providers on when they may wish to consider a psychology referral for their patient. The study also underscores the frequent co-occurrence of psychosocial distress, pain-related disability, and orofacial pain. However, as this study points out, patients with typically non-painful conditions can still experience orofacial pain. Moreover, pain is not the only symptom or issue that impacts a patient's health, quality of life, and functioning. Psychological treatment can benefit patients who have no pain (asymptomatic mucosal conditions, movement disorders, etc.) because many of the strategies and tools can be tailored to any patient's needs. For instance, psychologists can

help patients learn how to better cope with chronic health conditions, manage general stress or stress related to their condition, identify and change behaviors to improve their adherence to treatment plans, detect undiagnosed mental disorders, identify and address factors contributing to their chief complaint, or provide emotional support for patients with an inadequate support system.³⁹ This study additionally served as an evaluation of the patient referral process from oral medicine providers to OMCS psychology. Our study showed that mental illness was prevalent in this study population regardless of what type of chief complaint they reported. Therefore, we suggest that the first step in improving the referral process would be to create a single intake questionnaire to replace the two different questionnaires given to patients according to their chief complaint (pain vs. mucosal/salivary). We believe that using standardized medical history, review of systems, and mental health screening forms for each and every patient would help to improve screening for psychopathology among the clinic's entire patient population. Of note, OMCS providers vary in whether they use the SCL-90R, Generalized Anxiety Disorder-7 scale (GAD-7), and/or Patient Health Questionnaire-9 scale (PHQ-9) to screen for and measure psychosocial distress. The SCL-90R is longer and provides a more comprehensive representation of multiple types of psychosocial distress whereas the GAD-7 and PHQ-9 scales are shorter and only measure anxiety and depression, respectively. There may be a benefit in developing a standard practice for when to use each of these screening tools as well as other objective measures that may aid providers in evaluating their patients' mental health. Finally, we recommend creating a formal referral process that is efficient and easy for providers to use. It is our hope that this study encourages even further use of multidisciplinary care with mental health providers and helps improve screening for patients that may benefit from such care. A future study assessing the effectiveness of OMCS psychology services on treatment outcomes or quality of life measures would be valuable.

CHAPTER FIVE

CONCLUSION

Patients with orofacial pain who were referred to the University of Washington OMCS psychology service significantly differed from other orofacial pain patients who had no history of a referral to the service. While the Referred subjects had, on average, significantly higher levels of anxiety and depression, the study also highlighted the prevalence of mental disorders and high levels of anxiety and depression among Not Referred subjects. Our findings underline the frequent co-morbidity of orofacial pain and psychosocial dysfunction. Oral medicine specialists regularly evaluate for and treat patients with Axis II factors, and multidisciplinary care with mental health providers can facilitate treatment for these patients that is guided by a biopsychosocial model. Our study sought to address the questions of when and why are OMCS patients referred to the mental health providers available within our clinic. Both parts of the present study, the retrospective case-control study evaluating patient factors and the prospective OMCS provider survey evaluating oral medicine specialists, suggested that referral decisions were more often guided by signs of negative impact and interference associated with a condition as opposed to the type or severity of their condition. Similarly, evidence of psychosocial distress appeared to be more important than simply the presence of psychiatric conditions or use of psychiatric medications. Finally, barriers that may prevent a patient from completing psychology treatment following a referral appeared to also be taken into consideration. This study hopefully highlights the value of not only the OMCS psychology service but also internal psychology services in other oral medicine and orofacial pain clinics.

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APPENDIX

Figure 2 – Graded Chronic Pain Questions^{40,41}

<p>How would you rate your facial pain on a 0 to 10 scale at the present time, that is right now, where 0 is "no pain" and 10 is "pain as bad as could be"?</p>												
No pain	0	1	2	3	4	5	6	7	8	9	Pain as bad as could be	10
<p>In the past six months, how intense was your worst pain rated on a 0 to 10 scale where 0 is "no pain" and 10 is "pain as bad as could be"?</p>												
No pain	0	1	2	3	4	5	6	7	8	9	Pain as bad as could be	10
<p>In the past six months, on the average, how intense was your pain rated on a 0 to 10 scale where 0 is "no pain" and 10 is "pain as bad as could be"? [That is, your usual pain at times you were experiencing pain].</p>												
No pain	0	1	2	3	4	5	6	7	8	9	Pain as bad as could be	10
<p>About how many days in the last six months have you been kept from your usual activities (work, school or housework) because of facial pain?</p>												
<p style="text-align: center;">_____</p> <p style="text-align: center;">DAYS</p>												
<p>In the past six months, how much has facial pain interfered with your daily activities rated on a 0 to 10 scale where 0 is "no interference" and 10 is "unable to carry on any activities"?</p>												
No Interference	0	1	2	3	4	5	6	7	8	9	Unable To Carry On Any Activities	10
<p>In the past six months, how much has facial pain changed your ability to take part in recreational, social and family activities where 0 is "no interference " and 10 is "extreme change"?</p>												
No Interference	0	1	2	3	4	5	6	7	8	9	Unable To Carry On Any Activities	10

Figure 3 – Scoring Criteria for Grading Chronic Pain Severity^{40,41}

Characteristic Pain Intensity is a 0 to 100 score derived from Questions 1 through 3:
 Mean (Pain Right Now, Worst Pain, Average Pain) X 10

Disability Score is 0 to 100 score derived from Questions 4 through 6:
 Mean (Daily Activities, Social Activities, Work Activities) X 10

Disability Points: Add the indicated points for Disability Days (Question 7) and for Disability Score.

Disability Points			
Disability Days (0-180 Days)		Disability Score (0-100)	
0-6 Days	0 Points	0-29	0 Points
7-14 Days	1 Point	30-49	1 Point
15-30 Days	2 Points	50-69	2 Points
31+ Days	3 Points	70+	3 Points

Classification

Grade 0	No TMD pain in prior 6 months
Grade 1 Low Intensity Low Disability	Characteristic Pain Intensity < 50 < 3 Disability Point
Grade II High Intensity Low Disability	Characteristic Pain Intensity \geq 50 < 3 Disability Points
Grade III High Disability Moderately Limiting	3 to 4 Disability Points (Regardless of Characteristic Pain Intensity)
Grade IV High Disability Severely Limiting	5 to 6 Disability Points (Regardless of Characteristic Pain Intensity)

Figure 4 – Symptom Checklist-90R Measures⁴²

SCL-90 FORM					
In the LAST MONTH, how much have you been distressed by	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
a. Headaches	0	0	0	0	0
b. Nervousness or shakiness inside	0	0	0	0	0
c. Faintness or dizziness	0	0	0	0	0
d. Loss of sexual interest or pleasure	0	0	0	0	0
e. Feeling easily annoyed or irritated	0	0	0	0	0
f. Pain in the heart or chest	0	0	0	0	0
g. Feeling low in energy or slowed down	0	0	0	0	0
h. Sleep that is restless or disturbed	0	0	0	0	0
i. Trembling	0	0	0	0	0
j. Poor appetite	0	0	0	0	0
k. Crying easily	0	0	0	0	0
l. Feeling of being caught or trapped	0	0	0	0	0
m. Suddenly being scared for no reason	0	0	0	0	0
n. Blaming yourself for things	0	0	0	0	0
o. Pains in the lower back	0	0	0	0	0
p. Feeling lonely	0	0	0	0	0
q. Feeling blue	0	0	0	0	0
r. Worrying too much about things	0	0	0	0	0
s. Feeling no interest in things	0	0	0	0	0
t. Feeling fearful	0	0	0	0	0
u. Heart pounding or racing	0	0	0	0	0
v. Nausea or upset stomach	0	0	0	0	0
w. Soreness of your muscles	0	0	0	0	0
x. Trouble falling asleep	0	0	0	0	0
y. Difficulty making decisions	0	0	0	0	0
z. Trouble getting your breath	0	0	0	0	0

(Continued on next page)

In the LAST MONTH, how much have you been distressed by	NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY
aa. Hot or cold spells	0	0	0	0	0
bb. Numbness or tingling in parts of your body	0	0	0	0	0
cc. A lump in your throat	0	0	0	0	0
dd. Feeling hopeless about the future	0	0	0	0	0
ee. Feeling weak in parts of your body	0	0	0	0	0
ff. Feeling tense or keyed up	0	0	0	0	0
gg. Heavy feelings in your arms or legs	0	0	0	0	0
hh. Thoughts of death or dying	0	0	0	0	0
ii. Overeating	0	0	0	0	0
jj. Awakening in the early morning	0	0	0	0	0
kk. Thoughts of ending your life	0	0	0	0	0
ll. Feeling everything is an effort	0	0	0	0	0
mm. Spells of terror or panic	0	0	0	0	0
nn. Feeling so restless you couldn't sit still	0	0	0	0	0
oo. Feeling of worthlessness	0	0	0	0	0
pp. The feeling that something bad is going to happen to you	0	0	0	0	0
qq. Thoughts and images of a frightening nature	0	0	0	0	0
rr. Feelings of guilt	0	0	0	0	0
ss. The idea that something serious is wrong with your body	0	0	0	0	0
tt. The idea that something is wrong with your mind	0	0	0	0	0

**Table 5 – Medical conditions endorsed by subjects on the intake questionnaire,
grouped according to body systems.**

	Referred	Not Referred
	<i>N</i>	<i>N</i>
Cardiovascular	32	38
Respiratory	39	45
Gastrointestinal/Genitourinary	19	17
Autoimmune/Metabolic	21	30
Cancer	9	11
Infectious	38	42
Neurologic	13	21
Pain	66	63
Trauma	36	23
Psychological	43	42

Table 13– Oral medicine diagnoses documented at the referral/match visit, with breakdown of specific diagnoses.

	Referred	Not Referred
	<i>N</i>	<i>N</i>
TMD		
Disc displacement	11	10
Myalgia	37	27
Arthralgia	13	8
Degenerative joint disease	7	11
Unspecified TMD	11	7
Limited range of motion	0	3
Headache		
Tension-type HA	4	3
Migraine	2	2
Cluster HA	2	1
Paroxysmal hemicrania	1	0
Unspecified HA	17	13
Neuropathic		
Trigeminal neuralgia	2	3
Trigeminal neuropathic pain	16	19
BMS/Oral burning	13	11
Atypical facial pain	5	2
Taste dysfunction	1	0
First bite syndrome	0	1
Trigeminal sensory loss	0	1
Complex regional pain syndrome	0	1
Occipital neuralgia	2	1
Fibromyalgia	1	0
Chronic pain syndrome	1	0
Mucosal		
Lichen planus/Lichenoid mucositis	5	8
Viral infection	0	1
Stomatitis	4	8

	Oral linear IgA	0	1
	Papilloma	0	1
	Metal allergy	1	0
	Other tissue alterations ¹	1	6
Salivary			
	Sjögren's syndrome	0	1
	Xerostomia/Hyposalivation	4	7
	Hypersalivation	0	1
Movement disorder			
	Oromandibular dystonia	1	1
	Orofacial dyskinesia	1	1
	Tremor	0	1
Odontogenic			
	Fractured tooth	1	0
	Odontalgia	1	1
Bone			
	Exostosis	1	0
	Fibrous dysplasia	1	0
	Osteomyelitis	0	2
Other			
	CNS conditions	1	2
	Neck pain	2	3
	Ear conditions	3	7
	Sinus conditions	0	1
	Thyroid conditions	0	1
	Dermal conditions	1	1
	Occlusal conditions	2	2
	Tongue habits	1	0
	Sleep apnea	0	1

¹Includes oral ulcerations, erosive lesions, sore gums, dry lips, angioedema, swollen lips, lip hypertrophy, hairy tongue, macroglossia

TMD = temporomandibular disorder, BMS = burning mouth syndrome, CNS = central nervous system

Table 14 – The prevalence and type of psychiatric conditions, with breakdown of specific diagnoses.

		Referred	Not Referred
		<i>N</i>	<i>N</i>
Anxiety	Unspecified Anxiety	44	38
	Panic Disorder/Panic Attacks	2	2
	PTSD	0	2
	OCD	1	0
Mood	Unspecified Depression	40	26
	Bipolar Disorder	1	0
Neurodevelopmental	ADHD	0	1
Substance Use Disorder	Drug abuse	1	0
	Alcohol abuse	1	2
Other	BPD	1	0

PTSD = post-traumatic stress disorder, OCD = obsessive compulsive disorder,
ADHD = attention-deficit/hyperactivity disorder, BPD = borderline personality disorder

Table 15 – The prevalence of specific psychiatric medications used.

	Referred	Not Referred
	<i>N</i>	<i>N</i>
Anxiolytic		
Alprazolam/Xanax	2	3
Buspirone/Buspar	0	1
Clonazepam/Klonopin	13	8
Diazepam/Valium	4	3
Lorazepam/Ativan	5	6
Temazepam	0	1
Antidepressant		
Amitriptyline/Elavil	6	5
Bupropion/Wellbutrin	1	2
Citalopram/Celexa	5	5
Desipramine/Norpramin	1	0
Doxepin/Sinequan	1	0
Duloxetine/Cymbalta	4	4
Escitalopram/Lexapro	0	2
Fluoxetine/Prozac	4	4
Mirtazapine/Remeron	0	3
Nortriptyline/Aventyl	0	3
Paroxetine/Paxil	1	4
Sertraline/Zoloft	5	3
Trazodone/Desyrel	2	2
Venlafaxine/Effexor	2	1
Antipsychotic		
Quetiapine/Seroquel	1	0
Mood Stabilizer		
Carbamazepine/Tegretol	1	1
Valproate/Depakote	1	1
Lamotrigine/Lamictal	1	0
Stimulant		
Amphetamine/Adderall	1	0

Lisdexamfetamine dimesylate/Vyvanse	0	1
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Figure 5 – REDCap® Survey provided to OMCS providers.

Instructions:
 Section 1 - Several factors and clinical scenarios are listed below. Rate each factor/scenario individually, as opposed to rating them relative to each other. Assuming each factor applies to a hypothetical patient, please select how often you would factor it in to your decision to refer or not refer the patient to the UWOMCS psychologist.

	NEVER (factor this into decision to refer/not refer)	RARELY (factor this into decision to refer/not refer)	SOMETIMES (factor this into decision to refer/not refer)	OFTEN/ALWAYS (factor this into decision to refer/not refer)	
There are barriers to clinic access (e.g. lives far from clinic, transportation issues, scheduling limitations due to work/school)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
There are financial barriers to treatment (e.g. uninsured, psychologist service not covered by insurance)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient's receptiveness to being referred to psychologist	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
The patient independently requests a referral	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient's support system (presence or lack thereof)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Receptiveness of patient's support system (e.g. partner, family, friends, caregiver) to a referral	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient has diagnosis of mental disorder (e.g. generalized anxiety disorder, major depressive disorder, bipolar disorder, schizophrenia)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient has diagnosis of mental disorder without current professional management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
You perceive a patient's diagnosed mental disorder to be inadequately controlled or managed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
You suspect the patient has an undiagnosed mental disorder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient reports history of past suicide ideation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient reports current suicide ideation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient reports history of physical, sexual, emotional, or verbal abuse	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient reports post-traumatic brain injury or concussion with cognitive or behavioral effects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset

You or the patient suspect that a mental disorder (or dysfunction) is contributing to the oral medicine condition being managed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
You or the patient suspect that a mental disorder (or dysfunction) is interfering with treatment adherence/management for the oral medicine condition being managed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
You or the patient perceive there has been lack of improvement or worsening of the oral medicine condition being managed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
You or the patient suspect that a mental disorder (or dysfunction) is interfering with usual activities (e.g. work, childcare, household duties)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
You or the patient perceive the patient to be experiencing high levels of stress	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient has experienced the death of a loved one and you or the patient perceive that it has a continuing significant impact on the patient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient has a negative affect during appointment (e.g. crying, anxious, hostility, anger)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Patient demonstrates significant mood shifts during appointment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Responses to Graded Chronic Pain Scale (GCPS) questions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Responses to Symptom Checklist 90 (SCL-90)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Responses to Patient Health Questionnaire 9 (PHQ-9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
Responses to Generalized Anxiety Disorder 7 (GAD-7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	reset
<p>If there are other factors that impact your decision to refer and they were not listed above, please write them below.</p> <div style="border: 1px solid #ccc; height: 60px; width: 100%;"></div>					
Expand					

Instructions:

Section 2 - In your daily practice in UWOMCS, please select the factors you feel MOST COMMONLY impact your decision when considering a patient referral to the UWOMCS psychologist.

- Barriers to clinical access**
- Financial barriers to treatment**
- Patient's receptiveness to referral**
- Patient independently requests referral**
- Patient's support system**
- Receptiveness of patient's support system**
- Diagnosis of mental disorder**
- Diagnosis of mental disorder without current professional management**
- You perceive a patient's diagnosed mental disorder to be inadequately controlled or managed**
- You suspect the patient has an undiagnosed mental disorder**
- Patient reports history of past suicide ideation**
- Patient reports current suicide ideation**
- Patient reports history of physical, sexual, emotional, or verbal abuse**
- Patient reports post-traumatic brain injury or concussion with cognitive or behavioral effects**
- You or the patient suspect that the mental disorder (or dysfunction) is contributing to the oral medicine condition being managed**
- You or the patient suspect that the mental disorder (or dysfunction) is interfering with treatment adherence/management for the oral medicine condition being managed**
- You or the patient perceive there has been lack of improvement or worsening of the oral medicine condition being managed**
- You or the patient suspect that the mental disorder (or dysfunction) is interfering with usual activities**
- You or the patient perceive the patient to be experiencing high levels of stress**
- Patient has experienced the death of a loved one and you or the patient perceive a continuing emotional impact**
- Patient has negative affect during appointment**
- Patient demonstrates significant mood shifts during appointment**
- Responses to Graded Chronic Pain Scale questions**
- Responses to psychometric questionnaires (e.g. SCL-90, PHQ-9, GAD-7)**
- Other**

If there factors that MOST COMMONLY impact your decision when considering a patient referral to the UWOMCS psychologist and they were not listed above, please write them below.

Expand

Submit

Save & Return Later

Figure 6 – Criteria for when to consider a referral to a psychologist or other mental health professional

- Provider suspects undiagnosed or inadequately controlled mental disorder
- Provider or patient perceive mental illness is (at least 1 of the following):
 - Contributing to the oral medicine chief complaint
 - Interfering with recovery or treatment adherence
 - Interfering with usual activities (e.g. work, childcare, housework)
- Provider or patient perceive the oral medicine condition is not adequately treated or managed with physical interventions alone
- Moderate to severe scores on at least 1 of the following scales:
 - SCL-90R
 - PHQ-9
 - GAD-7
 - Other validated screening/assessment tool for mental disorders
- Patient independently requests referral