

Job Satisfaction Levels of Minnesota Dental Therapists and the Associated Correlates

A THESIS SUBMITTED TO THE FACULTY
OF THE
UNIVERSITY OF MINNESOTA

BY

Nancy Kay Hamson

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
MASTER OF SCIENCE IN DENTAL HYGIENE

Cynthia Stull MDH, BSDH, Advisor

June 2020

ACKNOWLEDGMENTS

Thank you to my thesis advisor, Cynthia Stull, for patiently guiding me through my thesis process. Also, I appreciate the knowledge and instruction I received from the University of Minnesota's dental hygiene faculty for strengthening my emotional intelligence and stretching my capabilities. Ashely Petersen's integral support with statistical assistance played a crucial role in completing this thesis. Lastly, the support from my family and friends sustained me through this adventure.

DEDICATION

This thesis is dedicated to my mother, Elaine Quarve. A single mother raising and supporting two daughters while working full-time who managed to create a safe and happy home. Her strength, dedication, and work ethic have instilled important values in my life. Her values merged with my Master's in Dental Hygiene Education have prepared me well for my new career as a dental hygiene educator. As I transfer this knowledge to others, I can only hope I will successfully do the same for my son, Andrew (AJ) Hamson. AJ, let this be an example to you that you can do whatever you put your mind too. Work hard and be kind. I love you both.

ABSTRACT

Purpose. Job satisfaction is important to employee commitment and performance, particularly in a new profession. There is an early indication that Minnesota (MN) DTs are satisfied with their career choice, however, correlates associated with job satisfaction are unknown. The purpose of this study was to investigate MN dental therapists' (DTs') job satisfaction and the associated correlates.

Methods. This study used a cross-sectional survey design. Licensed DTs currently practicing in MN comprised the study sample ($n=89$). Hackman and Oldham's Job Diagnostic Survey (JDS) was used to measure the levels of five core dimensions associated with job satisfaction (skill variety, task identity, task significance, autonomy, and feedback from the job itself). Additionally, job motivation was also explored using Hackman and Oldham's calculation for a Motivating Potential Score (MPS).

Results. The overall response rate was 33% ($n=28$). Eighty-seven percent of MN DTs surveyed are satisfied with their job. The job dimension that held the strongest correlation with job satisfaction among MN DTs was task significance (92%), followed by autonomy (85%), task identity (82%), and skill variety (80%), and feedback from the job itself (78%). Participants who work in a private dental office were more highly motivated compared to those working in other settings (95% confidence interval [CI]: 22-117 points higher).

Conclusion. This study found that MN job satisfaction is high. The correlates of job satisfaction reported among Minnesota dental therapists included responsibility to autonomously complete patient treatment utilizing a variety of skills, positive

professional and interpersonal relationships, perceived meaningfulness of their work, and feeling motivated for continued growth. However, suggestions for improvement include pay commensurate with skillset utilization, more feedback from stakeholders, and mentorship to encourage positive work-place relationships and sustainability for the profession.

TABLE OF CONTENTS

Acknowledgments.....	i
Dedication.....	ii
Abstract.....	iii
Table of Contents.....	v
List of Tables.....	vii
List of Figures.....	viii
Section 1.....	1
Introduction.....	2
Purpose of the Study.....	6
Statement of the Problem.....	6
Significance of the Study.....	6
Research Questions.....	7
Operational Definitions.....	8
Section 2.....	11
Review of the Related Literature.....	12
Job Satisfaction.....	12
Job Dissatisfaction.....	13
Theoretical Framework.....	15
Job Characteristics Model.....	18
Correlates Associated with Job Satisfaction.....	19
Psychological States Associated with Job Satisfaction.....	21
Moderating Variables.....	22
Team-Based Care.....	24
Job Satisfaction and Advanced Practice Registered Nurses.....	24
Job Satisfaction and Oral Health Care Practitioners.....	25
Global Dental Therapists and Job Satisfaction.....	28

Minnesota Dental Therapists and Job Satisfaction.....	29
Section 3.....	30
Manuscript.....	34
Introduction and Literature Review.....	34
Methods and Materials.....	36
Results.....	40
Discussion.....	46
Conclusion.....	50
Practical Application.....	51
Section 4.....	53
Tables.....	54
Table I.....	55
Table II.....	56
Table III.....	57
Table IV.....	58
Figures.....	59
Figure I.....	60
Figure II.....	61
Figure III.....	62
Figure IV.....	63
Figure V.....	64
Section 5.....	65
Comprehensive List of References.....	66
Section 6.....	73
Appendices.....	74
A. IRB Approval.....	75
B. Cover letter and Consent.....	77

C. Initial Postcard Survey Request.....	79
D. Second Postcard Survey Request.....	80
E. Final Postcard Survey Request.....	81
F. Survey.....	82
G. Job Diagnostic Short Form Answer Key.....	103

List of Tables:

Table I Demographic statistics compared to skill variety, task identity, task significance, autonomy, feedback, and the motivating potential score (MPS).....	55
Table II: The association between participant characteristics and the five core job factors scores	56
Table III: Summaries of the two additional job factors and the three moderating.....	57
Table IV: Summary of the associations between participant characteristics and the specific context satisfaction scores.....	58

List of Figures:

Figure I: Job Characteristics Model.....	60
Figure II: Motivating Potential Score Calculation, Hackman and Oldham, 1974.....	61
Figure III: Histograms summarizing scores on the five core job dimensions and overall motivating potential score.....	62
Figure IV: Histograms summarizing scores on the additional job dimension scores.....	63
Figure V: Histograms summarizing scores on the specific satisfaction dimension scores.....	64

SECTION 1

INTRODUCTION

Assessing job satisfaction is a complex task requiring triangulation of intrinsic factors such as how one feels at work, and extrinsic factors, such as compensation. The literature suggests positive feelings about one's identity in the workplace is an important factor in job satisfaction (1–3). Using one's knowledge and skills while impacting others contributes to feelings of self-worth which enhances job satisfaction (4,5). Job satisfaction is associated with a high level of employee engagement within a collaborative and positive work environment and may be measured by healthy relationships between expected work outcomes and an employee's reaction to the work (3,4,6).

Research has revealed numerous factors associated with health care providers' (HCPs) job satisfaction. In 2016, LeFloch et al. found physicians who were able to choose their patient care methods, organize their work schedules, and use a wide range of procedures, had higher levels of job satisfaction than physicians who had restrictions (7). Knight, Patterson, and Dawson suggest the importance of recognizing an employee's point of view and opportunities to enhance decision-making skills increase job satisfaction (4). Additionally, their results found that employees who perceived they were appreciated were able to successfully meet more job demands than those who did not feel supported (4). The importance of HCPs' job satisfaction is supported by Schriver's research linking physicians who are more satisfied with their job to a healthier work-life balance (8). The body of evidence suggests HCP autonomy in the workplace, appreciation and meaningful work reduces burnout, therefore promoting job satisfaction (8,9,10).

Conversely, job dissatisfaction has been found to contribute to depression, substance abuse, and higher than average suicide rates for some HCPs (8,10). Shanafelt et al., found that 3,338 out of 7,288 (45.8%) surveyed U.S. physicians, reported one or more symptoms of burnout (10). Schriver's findings underscore the importance of HCP's emotional health and positive patient outcomes (8). Additionally, organizational factors such as role ambiguity, lack of social support in the workplace, increased workloads, inadequate compensation, poor communication, reduced mental health, and the lack of team-based health care delivery have been found to be associated with lower levels of satisfaction among health care practitioner (HCP) which may result in patient dissatisfaction (11). A literature review by Schriver posited that physician's mental health is equally as important as patient health (8) asserted HCPs' mental health may be overshadowed by the ever-changing platform for the delivery of patient-centered care (8).

In 2007, the Institute for Healthcare Improvement developed a framework aimed at improving our health care system (12). The Triple Aim in Healthcare advocates for improved patient experiences by focusing on better access to cost-effective, quality health care (12). Recognizing the state of a HCP'S work environment can affect care quality, job satisfaction and patient outcomes, it has been proposed that the Triple Aim in Healthcare be expanded to include provider satisfaction as a Quadruple Aim (13,14). There is overwhelming evidence that patient errors increase when physicians and nurses suffer from job burnout suggesting the need for identification of correlates associated with job satisfaction (7,15,16). Understanding modifiable workplace factors may lead to improved OHCP job satisfaction and indirectly, improve patient outcomes.

In 2009, Minnesota (MN) introduced a new oral health care provider (OHCP) with the goal of expanding access to oral health care in underserved communities. Dental Therapists (DTs) are licensed oral health professionals who perform preventive and restorative services primarily to Minnesota's underserved populations (17). There are two programs in Minnesota that train DTs. Initially, graduates of the University of Minnesota (UMN) program were solely licensed as dental therapists and their scope of practice did not include the entire dental hygiene scope of practice (17). From 2009 to 2013, UMN offered a Bachelor of Science in Dental Therapy (BSDT) for students who did not have a baccalaureate degree and a Master's of Dental Therapy (MDT) for students with a conferred baccalaureate degree (17). In 2013, the Dental Therapy (DT) program began educating to the Advanced Dental Therapy (ADT) standards. In 2016, UMN created a dual-degree program, combining the dental hygiene and dental therapy curricula, allowing eligibility for licensure in both disciplines. Dental therapy students are enrolled in the Bachelor of Science in Dental Hygiene degree (BSDH) curriculum and simultaneously take courses in the DDS curriculum that align with the dental therapy scope of practice (17). Dental therapy students study identical curricula and train as a team with dental hygiene and dental students (17). After earning their BSDH degree, dental therapy students have one additional year of clinical experiences and graduate with a Master of Dental Therapy (MDT) (17). The other Minnesota DT program is at Metropolitan State University in conjunction with Normandale Community College. This program offers a Master of Science in Advanced Dental Therapy (MSADT) for licensed dental hygienists with a baccalaureate degree (17).

The ability to address oral health disparity in MN will, in part, depend on the ability to recruit and retain individuals in this emerging profession. Understanding factors that contribute to the level of job satisfaction is therefore vital to the expansion of dental therapy in Minnesota and the U.S. Since DTs have only been in practice since 2011, limited data exists concerning MN DTs job satisfaction. This study will examine job satisfaction among MN DTs and the correlates associated with job satisfaction.

Purpose of the Study

The purpose of this study is to investigate Minnesota dental therapists' job satisfaction and the correlates associated with job satisfaction levels.

Statement of the Problem

When dental therapy was introduced in MN it was surrounded by controversy (18-20). Stakeholders conceptualized an oral health workforce model that could address the oral health disparities in Minnesota (19-21). Supporters of this new delivery model hypothesized a dental therapist, earning a salary significantly less than a dentist, would help mitigate low reimbursement rates and expand access to care for Minnesota's underserved communities (18,19,22-24). Some Minnesota dentists and the American Dental Association (ADA) opposed dental therapy citing concerns about less education and clinical competency (18,21,23). After a decade in practice, dental therapists are increasing access to safe, competent care in Minnesota communities (19,25-28). However, little is known about the correlates of DTs' job satisfaction, including their perceptions of the variety of their work, their work environment, the significance of their work, and how feedback influences their attitude, motivation, and performance.

Understanding the level of job satisfaction and what job characteristics are associated with high levels of satisfaction will inform the practicing community allowing the enhancement of work environments. Improving job satisfaction will promote the retention of DTs and the expansion of dental therapy, allowing it to achieve its goal of decreasing oral health disparity in Minnesota.

Significance of the Study

The evolution of dental therapy in MN and the U.S will be dependent on recruiting and retaining DTs. Early evidence suggests DTs are gaining trust and acceptance among dentists and patients while expanding access to oral healthcare in MN (19). However, job satisfaction among MN DTs has not yet been comprehensively studied. The results of this study will provide insight as to whether DTs are happy they chose this new profession and what job characteristics are associated with high levels of job satisfaction. Knowledge gained from this study may inform current and future employers of dental therapists, dental therapy educational programs, and facilitate the integration of this new oral health care provider into the healthcare system. Factors related to job satisfaction can subsequently be addressed, enhancing the motivating potential of the job, thus impacting DTs' job satisfaction.

Research Questions

Question 1. For Minnesota dental therapists, what is the level of job satisfaction?

Question 2. For Minnesota dental therapists, what correlates are associated with levels of job satisfaction?

Operational Definitions

Autonomy. The degree to which an HCP can initiate patient treatment, control for determining the type of procedures, and have the independence for scheduling procedures (6).

Collaborative Management Agreement. A written management agreement between a DT, DH/DT, or an ADT with a Minnesota-licensed dentist (29). This relationship allows for DTs to provide evaluative, preventative, minor surgical dental care, and treatment planning within their scope of practice (29).

Dental Therapist (DT). “DTs are mid–level practitioners licensed by the Board of Dentistry and members of an oral health care team. They provide evaluative, preventive, restorative and minor surgical dental care within their scope of practice. Dental Therapists (DT) work under the direction of a dentist” (29).

Dually Licensed Dental Therapist (DH/DT). Mid–level practitioners certified by the Board of Dentistry as licensed dental hygienists and dental therapists who can provide evaluative, preventive, restorative and minor surgical dental care within their scope of practice primarily practicing in settings that serve low-income, uninsured, and underserved patients or in a dental health professional shortage area. Dental Therapists (DT) work under the direction of a dentist (29).

Advanced Dental Therapist (ADT). Advanced Dental Therapists (ADTs) are certified by the Board of Dentistry and, with their advanced training and clinical practice, are able to provide all the services that a Dental Therapist provides plus additional services such as oral evaluation and assessment, treatment plan formulation, non–surgical extraction of

certain diseased teeth, and more. ADTs also practice under the supervision of a licensed dentist, but the dentist does not need to see the patient prior to them receiving care or be on site during a procedure (29).

Context Satisfaction. The extent a job affects the experience of extrinsic working conditions such as satisfaction with compensation, job security, teamwork, supervisors, and the need for personal growth (6).

Correlates. Two or more related or complimentary things that support, facilitate, or impede something else. Example: DTs' abilities and tasks performed representative of their full scope of practice and skill utilization.

Experienced Meaningfulness. A psychological state pertaining to the degree an HCP experiences intrinsic value from innate and meaningful work experiences (1).

Experienced Responsibility. A psychological state achieved when autonomy provides freedom, independence, and discretion in determining the procedures and scheduling work to be performed (1).

Feedback. Information from the job itself, patients, co-workers, and/or administration that provides information about an HCPs' job performance (5,6)

Growth Need Strength (GNS). The strength of an HCP's desire for accomplishment, continued learning, and development (1).

Job Satisfaction. How an HCP feels positively or negatively about his/her job (4,5).

Knowledge of Results. A psychological state that occurs when an HCP is provided with direct, clear, and timely information on job performance effectiveness (1).

Knowledge and Skill. The level of knowledge and skill to determine the relationship between job characteristics and psychological states (1).

Motivating Potential Score. An indexing score from 1-343 (125 is average in the United states) reflecting the role of motivation in predicting job satisfaction (1).

Skillset. A range of skills or abilities.

Skill Variety. The degree to which a job requires various skills and expertise to accomplish work successfully (1).

Task Identity. How clearly the task is defined by having a clear beginning, middle, and end (1).

Task Significance. The degree to which a job extends to the well-being of others (1).

SECTION 2

REVIEW OF THE RELATED LITERATURE

In order to study job satisfaction among Minnesota dental therapists, a literature search was conducted in PubMed, CINAHL, and PsycINFO databases targeting all empirical research published in English from 2009-2019. A combination of Medical Subject Headings (MeSH) and keywords were used to search for the terms: Dental therapists, mid-level providers, United States, Minnesota, and United Kingdom. For the concept of "career satisfaction," MeSH and keywords used included: job satisfaction, quadruple aim, and dental therapist. As dental therapists are new to Minnesota's healthcare system, nurse practitioners and job satisfaction were reviewed for comparative analysis. Search terms for this third concept included nurse practitioner, job satisfaction, and scope of practice. The results were then limited to review. Online sources including the Minnesota Department of Health and the Pew Research Center were also searched for information about dental therapists. Studies regarding dental nurses and extended duty dental nurses (EDDNs) were excluded. Sixty-nine results met inclusion criteria and were included in the final literature review.

Job Satisfaction

The literature suggests optimal job satisfaction occurs when employees view a job as purposeful and meaningful, are able to demonstrate work responsibility, and clear expectations have been provided for employees' work quality (2,4,30). Numerous job characteristics are associated with job satisfaction, including, satisfaction with compensation, management, workplace relationships, benefits, and job security (1,2,6). However, despite varying levels of extrinsic reward for HCPs, research also points to intrinsic rewards, such as positive feelings derived from professional growth, workplace

achievements, and/or the ability to make autonomous treatment recommendations as being acute indicators for job satisfaction (31-34). The World Health Organization (WHO) suggests that an organized and supportive workplace environment increases the awareness of the type of work required to complete competently (35). Higher levels of job satisfaction and overall well-being are evident when employees are allowed to demonstrate responsibilities with optimal skill utilization (6,31,36). A literature review by Hoff, Carabetta, and Collinson suggests that as roles continue to expand for some HCPs, employers should design jobs reflective of abilities, which in turn, will maintain or increase HCPs mental health (31). A mutual approach to addressing workplace needs as well as the personal goals of HCPs may alleviate dissatisfaction, therefore, alleviating the gap in HCP workforce shortages.

Team-based patient care has also been associated with job satisfaction (36-39). Studies have shown that implementing a respectful team-based environment may reduce absenteeism, employee turnover, and/or negative workplace attitudes, therefore, resulting in a better workplace experience (2,3,6). In oral health care, the importance of collective work partnerships and workplace locations have increased job opportunities as well as access to oral healthcare (11,40). A 2017 systematic review by Knight, Patterson, and Dawson suggests the social benefits of group work (4). Team-based care has been a recent focus of the United States' health care system and is considered essential for constructing a more coordinated patient-centered delivery system (40,41). A primary objective of team-based care is to use the skillset of non-physician and non-dentist clinicians to increase the number of quality health care services delivered in a cost-effective manner (39,40,42). The paradigm shift from patient care by dentists in brick and

mortar locations has been transformed to include a team-based approach utilizing DTs in practice, mobile dentistry, and teledentistry contexts (17,27,39). Berthelsen et al. investigated work environments and OHCPs and concluded that in addition to the perception of internal value from doing the job itself, job satisfaction increased in respectful intraprofessional atmospheres (30).

Job Dissatisfaction

Burnout has been suggested as a contributing factor to job dissatisfaction (15,36,43,44). Maslach & Leiter's expanded research describes burnout as "A syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment that can occur among individuals who work with people in some capacity" (45). In the past few decades, significant research on health care occupations identified healthcare workers suffering high levels of burnout (46-48).

Burnout has been extensively studied in psychology as an indicator of reduced job satisfaction in many professions, including health care (4,6,47). In 2019, researchers with the Mayo Clinic reported that despite physicians' improved work-life balance over a six-year period, burnout symptoms remained prevalent and higher than the general US population (49). However, a 2019 study by Osborn et al., concluded that surveyed physician assistants in Minnesota simultaneously reported high levels of job satisfaction and moderate levels of burnout (50). When employees are in a prolonged stage of unhappiness, the likelihood of burnout increases which could result in job dissatisfaction, poor well-being, compromised patient care, and/or poor work relationships (2,15,45). A 2016 systematic review by Hall et al., postulated that a predictor variable associated with

burnout is depression, however, not all physicians who experience depression will experience burnout and/or be dissatisfied with their job (10).

HCP burnout is associated with negative consequences on multiple levels. Burnout is confounded by an increase in rates of substance abuse, suicide, and cardiovascular disease compared to the general population (8,9,15). HCPs who exhibit burnout may also be at an increased risk for patient dissatisfaction and patient safety due to increased medical errors (7,34,46). According to Maslach and Leiter, emotional exhaustion, cynicism, and inefficiency are the core components of burnout (44,45).

Emotional exhaustion has been correlated with headaches, chronic fatigue, gastrointestinal disorders, muscle tension, sleep disturbances, and increased illness suggesting physical symptoms manifest when emotional well-being is low (44-46). Patient-centered care is emotionally demanding as well as meaningful (48,49). The literature reveals that quality patient care is important to HCPs but may conflict with personal well-being due to an unbalanced work-life scenario (15,40,49).

Cynicism involves a disconnection from personal identity accompanied by the feeling of self-doubt (44,45). Difficulty dealing with patients or co-workers and/or job performance may correlate to negativity; leading to poor attitudes and interpersonal communication skills (45,46). In a health care setting, patients may become less human and more of an object compromising the quality of patient care (8,10,15).

Provider shortages also contribute to job dissatisfaction. During the past two decades, fewer medical students are specializing in primary care and more physicians are retiring early (8,15,49). Barnett's quadruple aim research proposes that the ebbing of

medicine as a career choice is a factor in the decreased access to affordable care (50). It has been posited that burnout, and/or poor well-being are linked to provider shortages in health care (15,50,51). Provider shortages contribute to several negative outcomes, including workplace inefficiencies. Efficiency encompasses the mechanism HCPs use to assess their skillset and optimal patient-centered care (45,46). Inefficiency in the workplace may result from the lack of personal accomplishment, doubting one's own capabilities, and few successful workplace relationships (45,46).

Job Satisfaction and Advanced Practice Registered Nurses

A dental therapists' role in dentistry is often likened to that of NPs or PAs in medicine (11,17,18). Akin to Minnesota's DTs, these advanced practice registered nurses (APRNs) initially faced physician opposition regarding role expansion (40,41,50). In Minnesota and other states where NPs have been able to utilize their full SOP, job satisfaction levels have increased (40,41,52). A 2017 study indicated that states allowing nurse practitioners' (NPs') independence from physicians resulted in higher levels of job satisfaction and increased primary care services for three times the number of patients when compared to states that limit NPs' potential (40). Reorganizing Minnesota's healthcare workforce to include independently practicing NPs has increased patient care options and serviced more underserved populations while promoting provider satisfaction (40,41,52). Alternatively, it has been reported that some APRNs report lower than average job satisfaction levels. A literature review by Hoff et al. found that some NPs' low job satisfaction levels have risen due to an increased workload, managerial expectations, and/or the inability to attain their full SOP due to additional limitations such as diminished skill or licensure restrictions (31). Contrarily, a 2019 Minnesota study

suggested that some PAs experience moderate amounts of burnout despite higher than average levels of job satisfaction (53). These findings suggest that some employees may be satisfied with their work, however, burned out in their current job (34,53). Osborn et al., posited that the flexibility of working in multiple specialties reduced burnout (53).

Job Satisfaction and Oral Health Care Providers

Job satisfaction of OHCPs and work environment has been studied for decades (7,10,15). One Australian study found higher job satisfaction ratings when dentists reported favorable patient and professional relationships, autonomous working conditions, and the ability to provide a wide range of services (54). Private practice traditionally provides higher income and more diverse skill opportunities than non-profit or Federally Qualified Health Centers (FQHCs) (59,60). Luzzi and Spencer advanced that private and public sector dentists experience varying levels of satisfaction regarding autonomy, professional relationships, and resources (54). However, dentists in private practice reported moderate satisfaction with compensation while public sector dentists reported dissatisfaction with compensation despite equal experience and education (54). Results from a United States (US) study found that dentists who employed licensed dental hygienists (LDHs) had more career longevity and the opportunity to practice their full SOP than those who did not employ LDHs (57). Vick found that more than ninety-five percent of surveyed LDHs working in Pennsylvania rated dental hygiene favorably as a career (57). It should be noted that LDHs who were employed full-time in one multi-provider practice and/or had attained advanced degrees or skills, such as the delivery of

local anesthesia, demonstrated the highest levels of job satisfaction and the lowest levels of burnout (57).

Further, studies of OHCPs indicate stress from time constraints, poor ergonomics, and reduced provider support increased the emotional demands related to health and human service work and may reduce job satisfaction or lead to burnout (30,58,59). Reduced teamwork, workforce shortages, lack of administrative support have also been found to contribute to OHCPs leaving the US and global dental workforce (3,58,59).

Global Dental Therapists and Job Satisfaction

Global data suggest varying levels of DT job satisfaction (60,61). DH/DTs in the United Kingdom (UK) who were delegated more preventative dental hygiene services than restorative services reported reduced job satisfaction (59, 67,68). A similar UK study reported 117 out of 470 DTs surveyed were not working as a DT (56). Of the 117 participants, almost all of them (91%) reported working as a dental hygienist (56). Csiker et al., found some DTs perceived their underutilization of restorative skills to represent a lack of professional support and/or awareness of abilities (37). Seventy percent of DTs thought dentists could refer more patients to them and 55% felt they were capable of utilizing more of their skillset range (62). Similarly, 63% of DH/ DTs surveyed by Turner, Ross, and Ibbetson stated they perceived dentists lacked confidence in their abilities due to the delegation of more dental hygiene services than restorative services (62).

In 2014, Singh studied job satisfaction of dental therapists in South Africa (63). Results indicated poor working conditions, low pay, lack of employment, and reduced SOP for some public health DTs due to low job satisfaction (63). Consequently, more DTs sought to work in private offices or attend dental school to further their careers (63). However, the public health DTs who had higher levels of job satisfaction also stated they received assistance with administrative, social, and societal expectations, which in turn, allowed them to utilize their skillset range (63,64).

Alternatively, multiple global studies indicate some DH/DTs receive dentist referrals and feel appreciated and trusted by dentists (65,66). The level of trust demonstrated by the delegation of restorative procedures increased morale leading to positive work experiences (66,67). When patients reported overall satisfaction with DTs' restorative skills, job satisfaction increased (67,68). A 2014 study by Mathu-Muju indicates DTs' provided equal to or better restorative work than dentists which promoted job satisfaction through mutual respect (65). Similarly, a review by Nash et al., reported that DTs provide competent treatment in which satisfactory dentist and patient feedback provided emotional support and motivation for continued successful patient relationships and work-related outcomes (60). Further, DTs' confidence levels improve by autonomously creating treatment plans they would complete from start to finish (60,62). Although some patients report initially apprehension initially, knowing that the dentist delegated the restorative work attested to DTs' competency (68,69). Research by Sun et al. reiterate that the availability for dentists to provide advanced dental care increased when dentists delegated more restorative work to DTs (68). Similarly, Self et al. found the acceptance and utilization of DTs and dually licensed dental therapists (DH/DTs) into

the oral care team improved over a four-year period in a dental school setting (70). Subsequently, MN dentists surveyed reported having more time for advanced procedures and MN DTs were able to practice at the top of their SOP by providing more advanced restorative procedures (28,29). A 2009 United Kingdom (UK) study on teamwork and DTs indicated when DTs felt they were part of a team, job satisfaction increased due to the dentists trusting their skill-set and quality of care they provided to patients (37). In the United Kingdom, DTs suggest that when dentists and DTs maximize their scope of practice respectively; mutual job satisfaction and patient-centered care are reciprocal (66,67). This symbiotic relationship satisfies patient needs as well as DTs' intrinsic needs, therefore, promoting increased levels of job satisfaction (68,69).

Minnesota Dental Therapists and Job Satisfaction

There is an early indication that MN DTs are satisfied with their overall career choice (25,28). Dentists appear to have an adequate workload for DTs and some are allowing DTs to utilize their skill-set range, thereby indicating a high level of trust and acceptance by dentists (19). Research by the Minnesota Department of Rural Health Office and Primary Care contradicts some global views regarding DTs and their satisfaction levels (25-29). A 2016 MN workforce survey of licensed DTs included the question, "How satisfied have you been with your career overall?" Based on 51 responses (n=58), 88% of MN DTs were satisfied (25). Sources of the most job satisfaction included patient relationships, working in a team-based environment, and the ability to provide oral health care to underserved populations (25). Some DTs noted job dissatisfaction regarding reduced job availability due to demographic limitations, patient restrictions, restricted opportunity to utilize their full SOP and burnout. It should be noted

that the professional misunderstanding of dentists regarding dental therapy as a profession also contributed to DT job dissatisfaction (25,29).

In response, the Minnesota Department of Rural Health Office and Primary Care released a Dental Therapy Toolkit designed as a resource for DT employers to gain knowledge about working with DTs (27). Effective communication between DTs and dentists and the endorsement of competency have shown to promote high levels of acceptance among patients (27). This acceptance to receive restorative treatment from other OHCPs, other than dentists, will continue to increase access to care and DT job satisfaction (17,18,25).

In 2019, the Minnesota Department of Rural Health Office and Primary Care released an updated DT workforce study (28). Ninety-two licensed MN DTs were surveyed. Based on 53 valid responses (98%) of MN DTs are satisfied in their career. Increased access to oral health care, dentist mentorship, effective and positive team relationships, and knowing they provide high-quality patient care increased participants' job satisfaction (28). Extrinsic factors that contributed to job dissatisfaction were identified as compensation not commensurate with work output, lack of quality jobs or desired locations, restrictions on prescribing practices, and negative views of the DT profession at a national level (28). As in previous MN DT studies, survey participants cited barriers regarding limitations in SOP (28). Therefore, understanding OHCPs' capabilities and contentment at work is important in determining job satisfaction levels.

Theoretical Framework

The conceptual framework for this study is based on Hackman and Oldham's Job Characteristics Model (JCM)(1). Hackman and Oldham theorize that working conditions conducive to healthy work atmospheres include positive attitudes and relationships, employee engagement, the opportunity for skill development, recognition, and the opportunity for evaluation (2,4). Redesigning a job to maximize the relationship between efficiency and satisfaction will enhance the employee's reaction and effort towards the job (72,73). The JCM has been used to study how certain factors affect job satisfaction within the individual's scope of work.

Job Characteristics Model

Hackman and Oldham developed the Job Characteristics Model (JCM) to study how certain factors affect career satisfaction within the scope of the work. The JCM posits five core job satisfaction factors: skill variety, task identity, task significance, autonomy, and feedback from the job itself (1). These five main factors influence psychological reactions to attitudes, motivation, and performance in the workplace (6). Skill variety, task identity, and task significance are associated with the meaningfulness of the work; autonomy relates to feeling responsible for the work; and feedback "from the job itself" represents receiving and understanding immediate feedback of the work performed (1,6). Two additional job satisfaction factors include "dealing with others", which relates to interpersonal relationships between administration, co-workers, and patients, while "feedback from agents" describes additional feedback opportunities, such as performance reviews and/or constructive peer feedback (1,6). Workplace communication is supported by a 2016 review by Knight, Patterson, and Dawson that

found administrative and peer feedback increased employee work engagement, supporting higher levels of well-being (4).

Hackman and Oldham suggest the presence of three critical psychological states, “experienced meaningfulness, experienced responsibility, and knowledge of work activity results”, will increase the probability of job satisfaction (1). The influence of these psychological states on ~~determine~~ reaction levels of attitudes, motivation, and performance in the workplace is supported by Gabr and Mohamed’s research with nurses (43). Their research found higher levels of job satisfaction when all core job factors and psychological states were evident (43). Subsequently, measuring job factors and psychological states may assist in the prediction of positive and/or negative work outcomes (4,72,73). Hackman and Oldham developed the Motivating Potential Score (MPS) as an index to measure how the five job factors and three psychological states may predict employee motivation (1). By understanding employee-specific job satisfaction needs, modifications can be made to enhance workplace satisfaction (1). This framework will assist in understanding MN DT job satisfaction levels and associations between job correlates.

Building on Herzberg’s Two-factor Motivation-Hygiene Theory, Hackman and Oldham acknowledge that although extrinsic factors momentarily influence job satisfaction, it is the intrinsic factors that will sustain job satisfaction (1,2,5). Herzberg argues that factors related to intrinsic job satisfaction (motivation factors) such as recognition for a job well done or doing meaningful work consistently, are associated with job satisfaction. However, extrinsic factors (Herzberg’s “hygiene factors”) are everchanging and require sustenance. Intrinsic motivators, such as achievement and

recognition are invariably inherent regardless of the type of work while extrinsic factors, such as supervision or compensation, are not (2,72,73). Herzberg postulates the opposite of job satisfaction is no satisfaction rather than dissatisfaction (2,48). Although the perception of what creates a good job can vary between employees, the intrinsic outcomes from doing work itself is a common denominator for good work environments (1,6). The literature suggests that positive working conditions can enhance intrinsic factors and should include opportunities to demonstrate responsibility, the ability to provide complete work from start to finish, and to have knowledge of work outcomes (1,4,15,58). Timely and usable feedback may enhance an employee's awareness to competently execute all of their job responsibilities, therefore, intrinsically adding to job satisfaction (2,4). This suggests that employees have an innate awareness and understanding of how doing their work may promote or deter job satisfaction (1,2,73).

Correlates Associated with Job Satisfaction

Skill variety. Skill variety pertains to the extent a job allows full use of an employee's skill-set and expertise to accomplish a task successfully (1). Hackman and Oldham posit employees who possess higher job satisfaction levels and perform a variety of complex skills, perceive their expertise is optimally being utilized (1,6). These findings are consistent with a 2014 study by Shetty and Gujarathi (75). Their study results indicated that most registered nurses (RNs) surveyed desired a work environment with opportunities for advancement, autonomous working conditions, and stimulating work (75). Similarly, Gabr and Mohamed found that most RNs would prefer to maximize their skillset with a few patients rather than overutilizing basic skills on many patients (43). Further, in 2017, WHO published information regarding the association between work-

related mental health concerns and the underutilization of skills (35). However, a Dutch study found that dental hygienists (DHs) with bachelor's degrees had conflicting views regarding an expanded SOP vs. 2-year or 3-year DHs (75). Some DHs with advanced training reported dissatisfaction due reduced autonomy and skill set variety (75). Adding restorative procedures to preventative and periodontal procedures reduced job satisfaction and experienced autonomy (75).

Task identity. Task identity pertains to the degree the task includes a clear beginning, middle, and end (1). Hackman and Oldham theorize that by allowing employees to finish a whole identifiable task rather than a portion promotes responsibility for the outcome (1,2). Personal value is found in contributing to the entire scope of work rather than contributing to only a portion of the work (1,6). In 2016, Xue, Ye, Brewer, and Spetz researched United States NPs and scope of practice (SOP) limitations (14). Their research revealed that NPs with greater SOP authority, symbiotically increased job satisfaction and access to affordable health care by more people (14). The ability for NPs to schedule initial appointments, provide treatment, and complete patient care goals resulted in patients receiving more care than by NPs working within a limited SOP (14,41,52). Additionally, defined tasks ensure employees, co-workers, and administrators understand the task sequence, therefore leading to increased feeling of responsibility towards the whole process (2,4).

Task significance. Task significance pertains to the degree a job influences the well-being of others (1,6). This suggests work meaningfulness extends beyond one's self and is related to intrinsic motivation (5). Hackman and Oldham suggest that when an employee's work is seen as important to the lives of co-workers, administration, and

society, job satisfaction will be impacted positively (5,6). A 2017 study by Hoff, Carabetta, and Collison found that some NPs and PAs reported more satisfaction from psychological and emotional rewards than extrinsic sources, such as compensation (7). A systematic review researching which positive factors influenced general practitioners' job satisfaction, reported higher income levels often reflect a burdensome workload and reduced personal time (34). These findings lend support to Hackman and Oldham's hypothesis that personal values will supersede external rewards (1,73).

Autonomy. For HCPs, autonomy pertains to the degree a job facilitates employee initiative in performing work, control in determining procedures, and independence in scheduling work (1,2,5). Hackman and Oldham assert employees who independently determine processes and procedures will increase their perception of responsibility, initiative, and motivation towards the task (2,5). The association between job satisfaction and autonomy is prominent in the literature (4,40,52). HCP autonomy has been shown to increase responsibility, professional growth, and provider relationships in the workplace (13,49,52). Poghosyan et al. advocate that NPs improve the healthcare outcomes for underserved populations when practicing independently from primary care physicians since more patients receive health care (52). Hence HCPs working in states that allow them to provide patient care with less physician supervision experience higher job satisfaction levels than states with licensure restrictions (52,53). Personal accountability for patient outcomes was also higher in RNs who provided more direct patient care using advanced skills as compared to indirect skills such as changing bedding or entering patient data (40).

Feedback from the Job Itself. Feedback from the job itself pertains to the information an employee receives from directly performing the work, such as completing an ideal dental restoration (1). Hackman and Oldham assert there should be a measurement for continuous and expedited feedback concerning employee task outcomes (1). Employee responsibility for quality control provides immediate information on job effectiveness or information to increase effectiveness. Also, employees who recognize the expectations of management or co-workers may achieve higher levels of job satisfaction (1). The literature suggests that understanding and implementing workplace expectations successfully boosts morale and motivation while respectful and timely constructive feedback allows employees to effectively continue workplace habits or make appropriate changes (1,5,8). As a result, receiving feedback significantly contributes to increased well-being and job satisfaction levels (3,8).

Psychological States Associated with Job Satisfaction

Experienced meaningfulness. Experienced meaningfulness pertains to the degree an employee derives value from innate and meaningful work experiences. Hackman and Oldham suggest meaningfulness is connected to the personal importance one feels about the skill variety, task identity, and task significance of their work (6). If a job has personal meaning to the employee and is viewed as making a difference to others, the task itself is motivating as opposed to simply completing a task (5,6). This is demonstrated in a 2016 MDH DT survey that reported being able to provide care to people who may not have received oral care was a source of pride with MN DTs (27).

Experienced responsibility. Experienced responsibility relates to the accountability autonomy brings to the work. Higher job satisfaction levels are achieved when employees

feel a sense of freedom to assert their independence and discretion for determining and/or scheduling the work to be performed (2,5,6). If an employee can utilize independent thought in performing job responsibilities, he/she can make appropriate modifications and recommendations. Therefore, the employee will continually grow as a result of feedback on job performance resulting in higher levels of job satisfaction (2).

Knowledge of results. Knowledge of results, such as immediate feedback and/or procedural results, are associated with feedback from the job itself. Research indicates that when employees are provided with direct, clear, and timely information that maintenance or necessary modifications to job performance will promote effectiveness due to the actual results of the work activities (2,5). Feedback from patients, peers, and/or administration can help close the gap between job satisfaction and dissatisfaction.

Insightful feedback about job performance, effectiveness, and/ or ineffectiveness will allow productive growth opportunities, therefore, increasing job satisfaction (2,5,7).

Berthelsen et al. argued that job satisfaction levels varied between dentists and dental hygienists by employment locations partly due to differing managerial styles (30).

Moderating Variables

Internal Work Motivation. Knowledge and skill delineate an employee's ability to perform a job well or not vs. wanting to do well, but unable due to lack of skill and/or knowledge (1). If employees understand their job demands, higher levels of job satisfaction may result due to having the skills to meet the demands. Contrarily, inadequate job performance due to not understanding job demands may lead to job dissatisfaction. Therefore, an adequate knowledge and the right skill mix may continue to increase job satisfaction through training and continuing education (2,4). Knowledge of

results, such as immediate feedback and/or procedural results, are associated with feedback from the job itself. Research indicates that when employees are provided with direct, clear, and timely information, maintenance or necessary modifications to job performance will promote effectiveness due to the actual results of the work activities (2,5).

Growth needs strength (GNS). GNS refers to how strong employees value work accomplishment, learning, and development as experienced through skill variety, task identity, task significance, autonomy, and feedback from the job itself (1). However, since employees' needs for growth vary, employees may respond better to enriched jobs tailored for their skillset range (2). Therefore, GNS variable moderates the level of positive work outcomes, intrinsic motivation, quality of performance, and/or satisfaction within different viewpoints of the same job (1,2).

Context satisfaction. Context satisfaction refers to the overall job satisfaction level (1). Additionally, extrinsic factors individualized to employee job satisfaction are sub-categorized by satisfaction with compensation, growth potential, job security, social dynamics, and/or supervision (1,5,6). Research suggests that when employees are satisfied with extrinsic rewards, then attitudinal responses to motivation and work performance may improve (4,6,7).

Understanding which core factor correlates best determine the level of job satisfaction is important for dental therapy and the professional community to promote dental team understanding, role clarity, and recruitment into this emerging profession. Measuring the psychological reactions to work outcomes may increase the awareness of how to maintain or increase motivation and well-being for improved job satisfaction. The

results of this study can offer insight towards DT job enhancement as MN DTs share their perception of what makes their work satisfying or not. The dental community, legislature, and other stakeholders can better understand how to design a work environment conducive to optimal job satisfaction for dental therapists. Therefore, the purpose of this study is to investigate MN DT's job satisfaction levels and correlates associated with job satisfaction as framed by Hackman and Oldham's Job Characteristics Model.

SECTION 3

MANUSCRIPT

This manuscript will be submitted to the *Journal of Dental Hygiene (JDH)*.

INTRODUCTION

Job satisfaction pertains to the degree employees feel positively or negatively about their job (1-3). Job satisfaction involves intrinsic factors, such as feelings about work, and extrinsic factors, such as workplace relationships and compensation. The literature suggests positive feelings about one's workplace identity is an important factor in job satisfaction. Despite varying levels of extrinsic reward for oral health care providers (OHCPs), research points to intrinsic rewards, such as positive feelings derived from professional growth, workplace achievements, autonomy, and optimal skill utilization, as being acute indicators for job satisfaction (33,36,47). Berthelensen et al. posit that using one's knowledge and skills while impacting others promotes self-worth (30). Utilizing a full range of abilities leads to higher levels of personal, workplace, and societal well-being; therefore suggesting positive work outcomes play a role in career satisfaction (4,6,11,34).

Hackman and Oldham developed the Job Characteristics Model (JCM) to study how certain factors and psychological states affect career satisfaction within the scope of the work (1,6). Their research found specific job satisfaction correlates and associated psychological reactions of attitudes, motivation, and performance influence job satisfaction (1,6). Specifically, the correlates include skill variety (the extent a job allows full use of an employee's skill-set and expertise to accomplish a task successfully), task identity (the degree the task includes a clear beginning, middle, and end), task

significance (the degree a job influences the well-being of others), autonomy (the degree a job facilitates employee initiative control, and independence in performing their work), and feedback (the information an employee receives from directly performing the work)(1). Hackman and Oldham contend that several additional correlates are central to their theory and defined them as: Experienced Meaningfulness of the Work (the degree to which an employee derives value from innate and meaningful work experiences), Experienced Responsibility of the Outcomes to the Work (the accountability that autonomy brings to the work), and Knowledge of the Actual Results of the Work Activities (immediate feedback and/or procedural results) (1). The JCM has been empirically tested in multiple disciplines and provides a measure to study how certain factors affect job satisfaction within the individual's scope of work.

Gabr and Mohamed found higher levels of job satisfaction among nurses when all core job factors and psychological states were evident (43). These findings are consistent with a job enrichment study by Faraji et al. (40). Utilizing the JCM, researchers found that HCPs with challenging and enriching jobs had higher levels of job satisfaction (40). Subsequently, measuring job factors and psychological states may assist in the prediction of positive and/or negative work outcomes (4,72,73). Job satisfaction is of particular importance when new professions are created to serve an identified purpose (8,73,76).

In 2009, Minnesota (MN) introduced a new oral health provider (OHCP) to address oral health disparities in underserved communities. Dental Therapists (DTs) are licensed mid-level OHCPs who perform preventive and restorative services primarily to Minnesota's underserved populations (17,19,27). The ability to address oral health disparity in MN will, in part, depend on the ability to recruit and retain individuals in this

emerging profession. Quality work environments that promote retention of DTs can facilitate improvement in access to oral care for underserved populations in MN. As DTs have been practicing in Minnesota since 2011, there is evidence that DTs are gaining trust and acceptance among dentists and patients as well as expanding access to oral healthcare (19). However, job satisfaction and associated correlates among MN DTs has not been comprehensively studied. Identifying which factors contribute to job satisfaction can promote healthy workplace environments and support the future of MN dental therapy. The aim of this study was to investigate MN DT's job satisfaction levels and correlates associated with job satisfaction.

METHODS

Hackman and Oldham's Job Characteristics Model was used as the conceptual framework to explore factors associated with MN DTs job satisfaction in this study (1). A cross-sectional sample of 89 licensed dental therapists currently working in Minnesota was surveyed via an online survey administered via Qualtrics™ at the University of Minnesota (UMN) during June-July 2019. Eighty-four DTs met the inclusion criteria: Minnesota DT licensure, graduation from an accredited program, the ability to read English, and access to email. Participants were identified through the Minnesota Bookstore, a division of the Minnesota Department of Administration, via the Minnesota Dental Therapy Association.

Procedures

Survey questions were piloted among UMN faculty and revisions to survey questions were made based on feedback. Eighty-four introductory postcards were mailed

to the sample population explaining the purpose of the survey, how the participants' information was obtained, the voluntary and confidential nature of the survey, and the contact information of the principal investigator (PI) along with the University of Minnesota Institutional Review Board (IRB) exception status and contact information. The postcards included a link with a quick response (QR) code to access the cover letter, information sheet, consent, and the survey. Participants were required to agree to the consent statement in order to proceed with the survey. Survey participation was confidential; no personal identifiers were obtained. The survey responses were coded for tracking purposes only to ensure non-responders received follow-up postcards. The second postcard was sent two weeks after the initial mailing. The final request was sent one month after the initial mailing. Anonymity was maintained by storing survey information devoid of personal emails in the University of Minnesota Box, a secure cloud-based storage service. This study received exempt status from the University of Minnesota Institutional Review Board (IRB) (00006354).

Data Collection

Instrument. The perception of job satisfaction was measured using Hackman and Oldham's unmodified, original 53-item JDS Job Diagnostic Survey (JDS) and validated scoring key. The JDS has shown validity and reliability and has been used to study job satisfaction in multiple disciplines, including dentistry (5,36,75). The JDS measures specific job satisfaction factors and associated Critical Psychological States. The five core factors and three psychological states are scored using a mathematical formula called the motivating potential score (MPS) (Figure I). The MPS may help determine the correlation between positive and/or negative work factors and job satisfaction (Figure II).

Moderating variables include *general job satisfaction, internal work motivation, and growth needs strength* inherent to the three Critical Psychological States associated with job satisfaction. Hackman and Oldham suggest higher moderating variable levels can predetermine higher levels in the Critical Psychological States.

Pre-existing slider-scales were used to measure components of job satisfaction. The survey was broken into five sections including perceptions of participants' job and utilization of job skills; the organizational impact on the job; personal feelings about the job; satisfaction with contextual factors, such as compensation and job security; and statements regarding what an employee would like to have to be satisfied with their job (Appendix F). Demographic data was also collected.

Data analysis

The job satisfaction dimensions, and demographic variables were summarized using descriptive statistics. To test for differences in the job satisfaction dimensions between subgroups (e.g., 30 or younger, 31-40, 41 or older; males vs. females; private practice vs. community non-profit locations, and commission-only, hourly, or salary), we used a two-sample t-test or one-way ANOVA, as appropriate. *P*-values less than 0.05 were considered statistically significant. No formal corrections were made for multiple testing. All analyses were performed using R version 3.6.1.

RESULTS

Of the 84 postcards mailed, 28 DTs completed the survey. One postcard was returned due to a non-forwardable address. Twenty-one participants responded to the initial survey request. Non-responders received a second postcard which resulted in an

additional 6 responses. A final mailing was sent to the remaining 57 MN DTs which generated one additional response resulting in a 33% response rate.

Table I summarizes the demographic characteristics of participants. Participants were ages: 30 years or younger (43%), 31-40 (36%), 41-50 (14%), or 51 years or older (7.1%). A majority (79%) were female. Almost all participants reported being employed full-time (93%). Compensation was varied, but half (50%) reported hourly compensation. Although most participants identified as White (79%), which mirrors Minnesota's population, a diverse background was represented in the study sample. The most common county of practice was Hennepin County, which includes Minneapolis (43%). More than half (56%) of MN DTs work in urban private dental practices.

Overall Job Satisfaction

Overall, the majority of Minnesota DTs report high levels of job satisfaction. General job satisfaction was measured as *context satisfaction* (6.0[mean], 0.76[SD]). Eighty seven percent of DTs reported satisfaction with their job and type of work. Specific *context satisfaction* scores are summarized in Table II and Figure III and include *social, individual growth, security, supervisory, and pay*. Female DTs aged 30 years or less, who work in private practice, and are compensated hourly scored the highest in overall job satisfaction. The mean scores of correlates of *context satisfaction* were generally high with *social satisfaction* (6.3,0.63) and *individual growth satisfaction* (6.2,0.69) scoring the highest. The majority of MN DTs (n= 25, 89%) reported they have good working relationships with administration, co-workers, and patients in which they empathize, identify with, and/or see others' perspectives. Those aged ≤ 30 years, female, and compensated hourly working private practice reported the most *social satisfaction*.

Eighty-three percent of participants also report high *job security satisfaction* (5.8,1.3) at their current job. Those aged ≤ 30 years averaged the highest for *job security satisfaction* and those aged ≥ 41 years were the lowest (5.0). Private practice and male were associated with higher scores.

Supervisory satisfaction was high (5.6,1.1) with 80% of MN DT reporting the quality of feedback they received was usable and felt supported by their supervisor. Regardless of location practiced, DTs who were female and salaried scored the highest in supervisory satisfaction. Those aged ≥ 41 years scored higher in dissatisfaction with supervisors (4.8, 1.1) than DTs ≤ 40 years.

Three-quarters of MN DTs (n=21,75%) feel adequately compensated with wage and benefits commensurate with their contributions to the organization (5.4,1.6), showing high *pay satisfaction*. Those aged 40 years or younger and/or male scored the highest.

Correlates of Job Satisfaction

The second research question was answered by analyzing responses to items on the JDS including Core Job Dimensions, Other Job Dimensions, Critical Psychological States, and Moderating Variables. The associations between surveyed MN dental therapists' work conditions and the core job factors scores are summarized in Table III.

Five Core Job Dimensions

Summaries of scores on the five core job dimensions and overall MPS are shown in Table III and Figure IV. The majority (n=22, 78%,) of the participants reported being able to effectively use a variety of complex skills to complete their job showing high *skill variety* satisfaction. Females aged 30 or younger, compensation by commission, and in private practice scored the highest.

Task identity scores were high. Most (n=23, 82%) participants believed they were able to utilize their skillset to complete patient care from beginning to end. Of statistical significance was participants who reported working in a private dental office averaged 0.91-point higher *task identity* scores (95% CI: 0.33-1.5 points higher). There was no difference in *task identity* scores between types of compensation. Men averaged a higher *task identity* score than females. Nearly all, (n= 25, 92%) participants expressed they were making an impact on the well-being of other people. This shows high *task significance*. Participants 40 years and younger, in private practice, and hourly compensation scored the highest in *task significance*. Females and males had equal scores.

Autonomy was a common core dimension among participants, with 85% of participants reporting independence and discretion to determine the necessary procedures to complete patient treatment. Males aged \leq forty years working in a commission-based, private practice scored the highest. Although overall, participants scored lowest on *Feedback from the Job Itself*, 78% of participants felt they received direct feedback on their performance. Males aged \leq 40 years working in a commission-based, private practice scored the highest (6.0). Females aged \geq 41 years scored the lowest (4.9).

The Motivating Potential Score (MPS) has a range of 1 (lowest) to 343 (highest). Of statistical significance is that participants who reported working in a private dental office averaged 69-point higher MPS compared to those who did not (95% confidence interval [CI]: 22-117 points higher). Of those participants, males working in private practice compensated by commission scored the highest. Those who reported working in a private dental office averaged 69-point higher MPS and 0.91-point higher *task identity*

scores (95% CI: 0.33-1.5 points higher) compared to those who did not (95% confidence interval [CI]: 22-117 points higher).

Additional Job Dimensions

Summaries of the two additional job dimensions and moderating variables are shown in Figure V. The associations between subject characteristics and these additional job dimension scores are summarized in Table IV. Mean (6.3, 0.77) scores showed Minnesota DTs scored high in both dimensions with more DTs (n = 25; 90%) reporting they work closely with others, demonstrating *dealing with others* was highly correlated with job satisfaction. Of statistical significance, men averaged 0.51-point higher in *dealing with others* scores (95% CI: 0.07-0.94) than females. Similar scores were found between DTs working in private practice and community/non-profit locations. DTs compensated by commission ranked higher than hourly or salaried DTs. *Feedback from agents* (5.1, 1.4) was also found to be strongly related to job satisfaction as DTs (n = 20, 73%) reported receiving feedback from supervisors or co-workers on their work effectiveness improved job satisfaction.

The *internal work motivation* scores (6.2, 0.64) were high with 88% of DTs reporting they are driven to perform work effectively due to the personal satisfaction from using their knowledge and skill by working as a dental therapist. Eighty-eight percent females had a slightly higher internal work motivation; however, scores were similar across ages and practice location. Those being paid on commission (6.6, 0.43) had higher *internal work motivation* scores than those paid hourly (6.3, 0.54) and salaried (5.9, 0.77). For *growth needs strength* (6.4, 0.67), Minnesota DTs (n = 25, 91%) responded positively towards growth from stimulating, yet challenging work due to the

opportunities to practice independent thought in their work. DTs aged ≤ 40 years reported a slightly higher *growth needs strength*. Individual *growth satisfaction* scores were high (6.2, 0.69). The majority (89%) of MN DTs perceive they have grown personally, felt challenged through independent thought and actions, and feel self-worth from doing the work. Female DTs, working in private practice, and/or aged younger than 40 years had a higher individual *growth needs strength*.

Critical Psychological States

When averaged, *skill variety*, *task identity*, and *task significance* showed that nearly eighty-five percent (n=24) of MN DTs experienced *Meaningfulness of the Work*. This was reported as improved well-being from the intrinsic value in helping patients and co-workers. Eighty-five percent (n=24) experienced direct *Responsibility of the Outcomes to the Work* by taking personal responsibility for doing their job well. Seventy-eight percent (n=22) of MN DTs described working in an environment that provides direct and clear feedback on job performance as reflected in their *knowledge of the actual results of the work activities* scores (Figure I).

DISCUSSION

This study explored MN DTs levels of job satisfaction and the job correlates are associated with varying levels of job satisfaction. Minnesota DTs reported high levels of job satisfaction. Using Hackman and Oldham's Job Characteristics Model of five core job satisfaction factors (correlates) as a framework, the significance of their work was the most important correlate of satisfaction among MN DTs. Knowing that they were making an impact on the lives and wellbeing of others, influenced their satisfaction and intrinsic desire to do well.

Hackman and Oldham's Job Characteristics Model (JCM; Figure 1) posits a job representative of skill variety, task identity, task significance, autonomy, and feedback from the job itself provides meaningful work. Additionally, if employees value these five core job factors and the associated psychological states of experienced meaningfulness, experienced responsibility, and knowledge of the actual work activities, then higher levels of job satisfaction will exist. Study results found MN DTs to have varying levels of satisfaction regarding the five core job factors. Task significance was the most valued core job factor. Participants reported they felt they were making a substantial impact on the lives and well-being of their patients and co-workers by working as a dental therapist. MN DTs find intrinsic job factors such as doing meaningful work more satisfying than extrinsic job factors, such as compensation.

MN DTs reported autonomy as very important to their job satisfaction. The accountability and responsibility to create and carry out the full treatment plan was important to MN DT's. Although, most MN DTs report the ability to determine how to use their skills, findings suggest DTs want to practice at the top of their SOP. This finding supports previous findings in the literature. Xue et al. found that nurse practitioners (NPs) who worked in states with an expanded scope of practice (SOP), autonomously delivered more primary healthcare to underserved populations than NPs in restrictive states (11). Subsequently, Park et al. proposed that the removal of SOP barriers increased NPs autonomous practice and efficiency to treat more underserved patients, increasing job satisfaction (46). MN DTs show accountability for comprehensive oral health care by providing high-quality care. They report job satisfaction improves with

increasing responsibility. Therefore, increasing their SOP, may continue to increase job satisfaction levels.

Of moderate satisfaction was task identity. This indicates that providing patient care from start to finish was important to MN DTs. Survey participants who reported working in a private dental office had statistically significantly higher task identity scores compared to non-private settings. This suggests MN private practice dentists who employ DTs have high levels of trust allowing them to utilize their range of skills. Subsequently, skill variety was crucial to job satisfaction. Some participants reported being able to effectively use a variety of complex skills to complete while some did not. This suggests a better understanding is needed to determine the right skill mix required to continue and improve professional growth and job satisfaction levels.

Factors that led to lower job satisfaction levels were related to the lack of receiving immediate and ongoing feedback from multiple sources. These findings reflect the need for further study to examine how feedback is solicited, delivered, and/or utilized to make work more enjoyable. Further, research should investigate feedback strategies such as post-procedural patient feedback surveys, timely performance reviews, and/or informal opportunities to meet with employers.

Although extrinsic factors are important for motivation and job satisfaction, for almost all the surveyed MN DTs, it is the intrinsic drive from personal achievement that contributes to quality work performance and their overall job satisfaction. Similar to DTs across the globe, MN DTs enjoy meaningful work and know that they are providing patient care with positive outcomes (26,28,56). This study is consistent with a 2019 study on job satisfaction and OHCPs (28). Study findings suggested that OHCPs were most

satisfied with the high quality of patient care and felt happy from a job well done (28). MN DTs envision dental therapy as a growing profession, and many feel secure in their job as a dental therapist. According to the Job Diagnostic Survey the average Motivating Potential Score is 125 (1,6). Minnesota DTs average score of 200, reflecting the high potential for motivation. Conversely, Shetty and Gujarathi found that nurses they surveyed averaged 133 for an MPS (45). This finding shows MN DTs are professionally motivated to be better and do better. Consequently, satisfaction with compensation scored the lowest in individualized job satisfaction factors.

Study Limitations

Misinterpretation in determining dual licensure (DH/DT) occurred with some participants. Thus, we are unable to report on the overall percent who were dual vs. single licensure. Secondly, the results of this study are limited to the 28 Minnesota participants who completed the survey, however, the number of responses (33%) in this descriptive study met statistical test criteria. Finally, although the JCM has been empirically tested and a widely used instrument for determining levels of job satisfaction in multiple disciplines for decades, we may have found different results than other studies.

Conclusion

Minnesota dental therapists report high satisfaction with their jobs. Correlates of job satisfaction were found to include autonomy, the ability to perform a variety of tasks within their scope of practice, positive professional relationships, perceived meaningfulness working as an oral healthcare provider, and feeling motivated for continued growth. Although job satisfaction is high, MN DTs made several suggestions

to encourage positive work-place relationships, including pay that is more commensurate with skillset utilization, more feedback from stakeholders, and mentorship. MN DTs' ambition is strong and worth stakeholders' investment in time and effort to understand correlates of DTs job satisfaction to foster sustainability of the profession.

Practical Application

The findings from this study can inform DTs and their employers on job satisfaction and improvements. Subsequently, dissatisfaction can be addressed to advance and sustain the DT profession. Pertaining to Hackman and Oldham's five core job satisfaction factors, task significance was most important to MN DTs. Making an impact on the lives and wellbeing of others incorporates their intrinsic desire to do well. The perception of making a positive impact strengthens relationships between OCHPs as a patient-care team, therefore, benefiting DT and patient well-being in tandem. Autonomy is highly important to MN DTs. They are accountable by providing high-quality care while practicing at the top of their SOP. Job satisfaction is commensurate with increased responsibility. DTs demonstrate they are capable of comprehensive oral health care. Therefore, increasing their SOP, may continue to increase job satisfaction levels. Task identity is evident with MN DTs as they are self-confident and proud of the care they provide. Patient treatment that was started and completed by DTs increased their job satisfaction. Consequently, while MN dentists concentrate on advanced procedures, MN DTs are happy to provide comprehensive oral health care. It is imperative to MN DTs to utilize their full SOP. For highly motivated employees, limitations combined with a monotonous working environment will not provide professional growth and the intrinsic meaning associated with skill variety. MN DTs ambition is strong and worth

stakeholders' investment in time, expansion opportunities, and advocacy for pay commensurate with skillset utilization. Lastly, since MN DTs request more feedback from stakeholders, the benefits of mentorship should be further explored to encourage positive work-place relationships and sustainability in this new oral health care professional. For Mn DTs to maintain or increase job satisfaction, all stakeholders in oral health care must continue to work together. Understanding what correlates could sustain or improve the job satisfaction of DTs could therefore be applied role expansion in the United States and globally.

SECTION FOUR

TABLES

Table I: Demographic characteristics of survey participants

	All participants¹ (n = 28)
Age	
30 or younger	12 (43%)
31-40	10 (36%)
41-50	4 (14%)
51 or older	2 (7.1%)
Female	22 (79%)
Race	
White	22 (79%)
White and American Indian or Alaskan native	1 (3.6%)
Asian	1 (3.6%)
Black or African American	1 (3.6%)
Native Hawaiian or Pacific Islander	1 (3.6%)
Multiracial	2 (7.1%)
Hispanic	1 (3.6%)
Fluent in another language	1 (3.6%)
Employed full-time	26 (93%)
Pay structure	
Hourly	14 (50%)
Salary	8 (29%)
Commission only	4 (14%)
Base and commission	2 (7.1%)
Working location²	
Private dental office	17 (61%)
Community non-profit	10 (36%)
Federally qualified health center	4 (14%)
Education or research	4 (14%)
Mobile unit or teledentistry	2 (7.1%)
Hospital or long-term care center	1 (3.6%)
Other	1 (3.6%)
Counties of practice^{2,3}	
Urban	15 (56%)
Predominately large town	6 (22%)
Predominately small town	9 (33%)
Rural	4 (15%)

1. Summaries shown are n (percent).

2. Survey participants were able to select all categories that applied- Note these variables will have percentages that sum to more than 100% since participants could select multiple options.

3. One participant indicated that he/she did "mobile dentistry in dozens of counties in the state and thus are excluded from this summary due to unknown counties

Table II: Summary of the associations between employment characteristics and the individual context satisfaction scores.

	n	Pay Satisfaction Mean (SD)	p-value	Security Satisfaction Mean (SD)	p-value	Social Satisfaction Mean (SD)	p-value	Supervisory Satisfaction Mean (SD)	p-value	Growth Satisfaction Mean (SD)	p-value
Age			0.53		0.12		0.17		0.09		0.30
30 or younger	12	5.6 (1.7)		6.3 (0.72)		6.4 (0.55)		6.0 (1.1)		6.3 (0.59)	
31-40	10	5.6 (1.5)		5.8 (1.2)		6.5 (0.36)		5.6 (0.99)		6.2 (0.66)	
41 or older	6	4.8 (1.6)		5.0 (1.9)		5.9 (0.98)		4.8 (1.1)		5.8 (0.90)	
Female			0.13		0.23		0.69		0.83		0.47
No	6	6.1 (0.92)		6.3 (0.98)		6.2 (1.1)		5.5 (1.3)		5.9 (0.90)	
Yes	22	5.2 (1.7)		5.7 (1.3)		6.4 (0.45)		5.6 (1.1)		6.2 (0.63)	
Private dental office			0.57		0.33		0.18		0.90		0.11
No	11	5.2 (1.1)		5.5 (1.3)		6.2 (0.23)		5.6 (0.72)		5.9 (0.54)	
Yes	17	5.6 (1.9)		6.0 (1.3)		6.4 (0.78)		5.6 (1.4)		6.3 (0.75)	
Community non-profit			0.51		0.50		0.24		0.68		0.16
No	18	5.6 (1.7)		5.9 (1.4)		6.4 (0.75)		5.7 (1.3)		6.3 (0.75)	
Yes	10	5.2 (1.6)		5.6 (0.85)		6.2 (0.28)		5.5 (0.81)		5.9 (0.53)	
Pay			0.94		0.34		0.07		0.68		0.75
Commission only	4	5.4 (2.6)		6.6 (0.48)		5.8 (1.4)		5.4 (1.1)		6.3 (1.2)	
Hourly	14	5.5 (1.6)		5.6 (1.4)		6.5 (0.41)		5.5 (1.5)		6.2 (0.66)	
Salary	10	5.3 (1.3)		5.9 (1.2)		6.2 (0.32)		5.9 (0.57)		6.0 (0.53)	

Table III: The association between participant characteristics, motivating potential score, and the five core job factors scores.

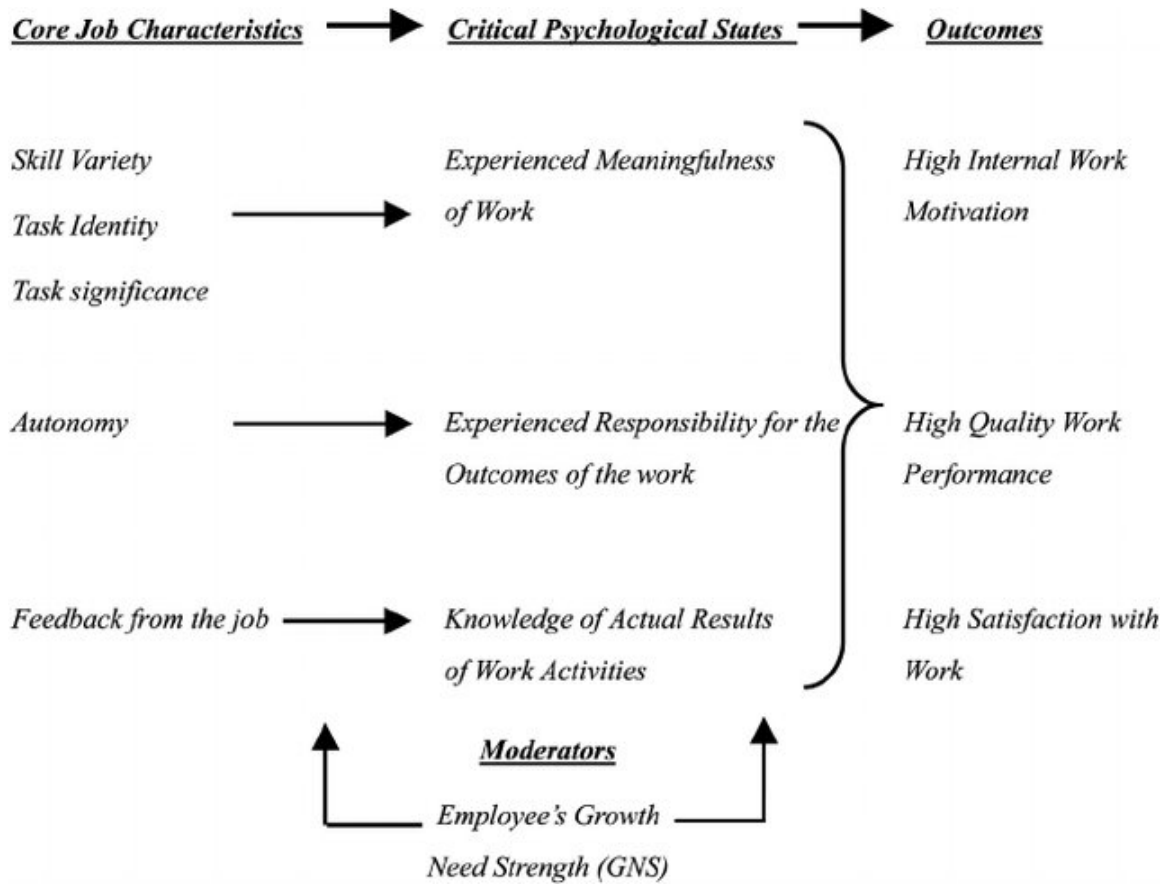
	n	Motivating Potential Score Mean (SD)	p- value	Skill Variety Score Mean (SD)	p- value	Task Identity Score Mean (SD)	p- value	Task Significance Score Mean (SD)	p- value	Autonomy Score Mean (SD)	p- value	Feedback from Job Score Mean (SD)	p- value
Age			0.10		0.66		0.40		0.10		0.72		0.12
30 or younger	12	229 (63)		5.8 (0.93)		6.0 (0.76)		6.7 (0.35)		6.1 (0.82)		6.0 (0.73)	
31-40	10	193 (61)		5.5 (0.71)		5.7 (0.80)		6.7 (0.54)		6.1 (0.67)		5.2 (1.2)	
41 or older	6	162 (60)		5.6 (1.1)		5.4 (1.2)		6.1 (0.95)		5.8 (1.1)		4.9 (1.4)	
Female			0.20		0.53		0.10		0.84		0.30		0.10
No	6	235 (65)		5.4 (1.0)		6.2 (0.58)		6.5 (0.41)		6.3 (0.57)		6.1 (0.77)	
Yes	22	193 (63)		5.7 (0.84)		5.7 (0.91)		6.5 (0.67)		6.0 (0.87)		5.3 (1.2)	
Private dental office			0.006		0.20		0.003		0.50		0.10		0.07
No	11	160 (62)		5.4 (0.84)		5.2 (0.68)		6.4 (0.80)		5.7 (1.0)		4.9 (1.4)	
Yes	17	229 (52)		5.8 (0.88)		6.2 (0.79)		6.6 (0.47)		6.3 (0.61)		5.8 (0.70)	
Community non-profit			0.21		0.75		0.35		0.51		0.80		0.15
No	18	214 (60)		5.6 (0.95)		5.9 (0.93)		6.6 (0.65)		6.1 (0.79)		5.8 (0.85)	
Yes	10	180 (71)		5.7 (0.78)		5.6 (0.75)		6.4 (0.57)		6.0 (0.92)		5.0 (1.4)	
Pay			0.22		0.26		0.74		0.75		0.13		0.26
Commission only	4	254 (13)		5.9 (0.88)		5.7 (0.90)		6.8 (0.32)		6.7 (0.38)		6.2 (0.50)	
Hourly	14	196 (70)		5.8 (0.91)		5.9 (0.95)		6.5 (0.53)		6.1 (0.60)		5.2 (1.3)	
Salary	10	188 (64)		5.3 (0.78)		5.7 (0.79)		6.5 (0.82)		5.7 (1.1)		5.6 (0.99)	

Table IV: Summaries of the two additional job factors and the three moderating variables

	n	Feedback from Agents Mean (SD)	p-value	Dealing with Others Mean (SD)	p-value	General Job Satisfaction Mean (SD)	p-value	Internal Work Motivation Mean (SD)	p-value	Individual Growth Need Strength Mean (SD)	p-value
Age			0.03		0.40		0.23		0.93		0.87
30 or younger	12	5.9 (1.0)		6.6 (0.67)		6.4 (0.67)		6.1 (0.70)		6.4 (0.43)	
31-40	10	4.5 (1.7)		6.3 (0.93)		6.0 (0.82)		6.2 (0.76)		6.4 (0.71)	
41 or older	6	4.6 (0.46)		6.1 (0.71)		5.7 (0.80)		6.2 (0.33)		6.2 (1.0)	
Female			0.58		0.02		0.36		0.40		0.41
No	6	5.4 (1.4)		6.8 (0.27)		5.8 (0.93)		5.9 (0.85)		6.1 (0.73)	
Yes	22	5.0 (1.4)		6.3 (0.84)		6.2 (0.72)		6.2 (0.58)		6.4 (0.66)	
Private dental office			0.14		0.25		0.59		0.15		0.27
No	11	4.6 (1.3)		6.2 (0.89)		6.0 (0.68)		6.0 (0.64)		6.2 (0.71)	
Yes	17	5.4 (1.4)		6.5 (0.69)		6.2 (0.83)		6.3 (0.62)		6.5 (0.64)	
Community non-profit			0.47		0.52		0.76		0.88		0.60
No	18	5.2 (1.4)		6.3 (0.87)		6.1 (0.77)		6.2 (0.75)		6.4 (0.77)	
Yes	10	4.8 (1.4)		6.5 (0.61)		6.0 (0.81)		6.2 (0.44)		6.3 (0.48)	
Pay			0.93		0.36		0.49		0.17		0.79
Commission only	4	5.0 (2.2)		6.8 (0.19)		5.7 (1.1)		6.6 (0.43)		6.6 (0.44)	
Hourly	14	5.0 (1.5)		6.4 (0.73)		6.2 (0.75)		6.3 (0.54)		6.3 (0.71)	
Salary	10	5.2 (0.85)		6.2 (0.95)		6.1 (0.71)		5.9 (0.77)		6.3 (0.73)	

FIGURES

Figure I: Job Characteristics Model



Job Characteristics Model from Hackman and Oldham, 1980

Figure II: Motivating Potential Score Calculation, Hackman and Oldham, 1974

$$\text{MPS} = \frac{(\text{Skill variety} + \text{Task identity} + \text{Task significance})}{3} \times \text{Autonomy} \times \text{Feedback}$$

3

Figure III: Histograms summarizing scores on the specific context satisfaction scores.

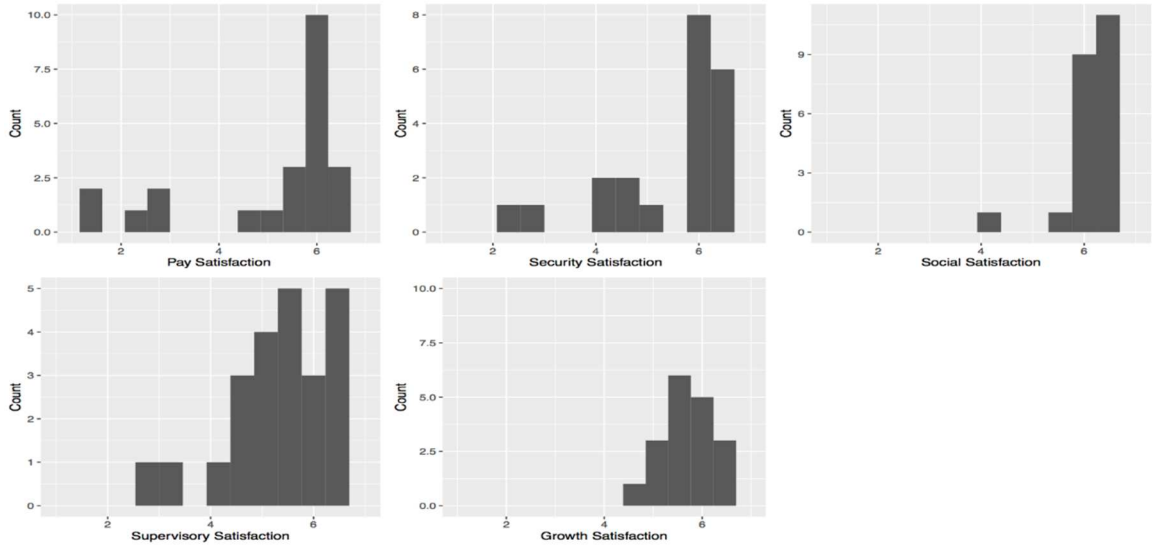


Figure IV: Histograms summarizing scores on the five core job factors and overall motivating potential score.

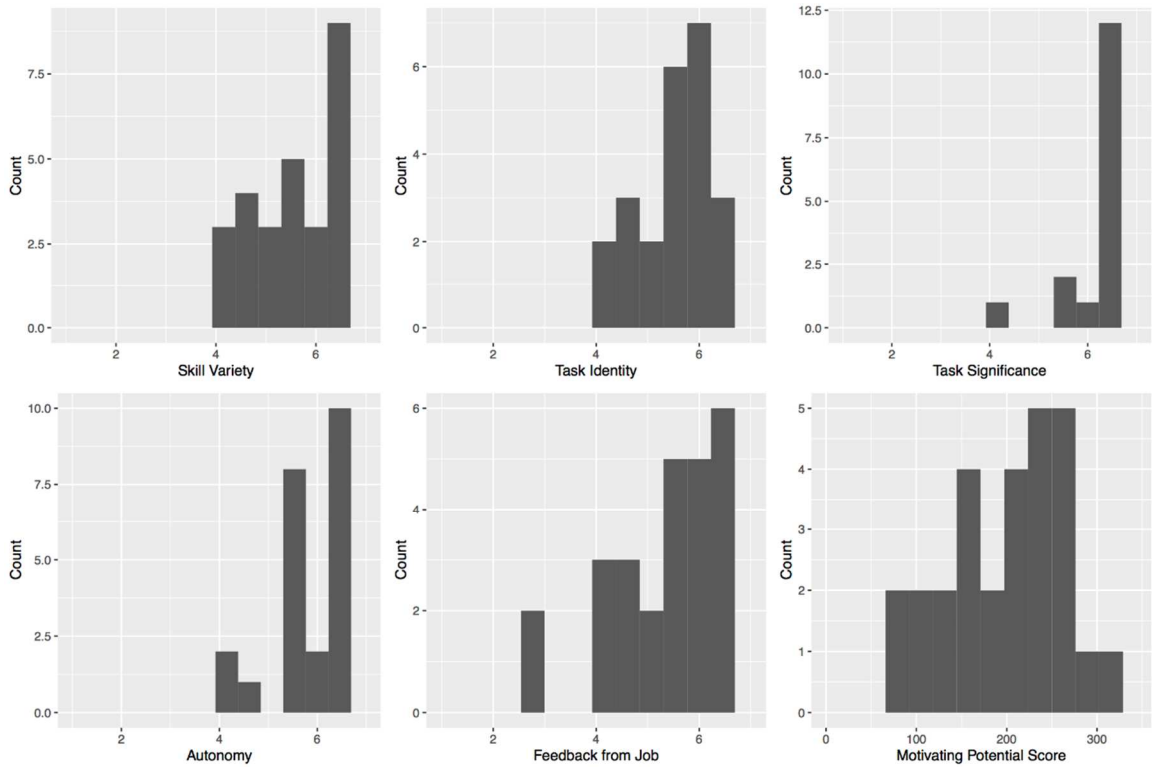
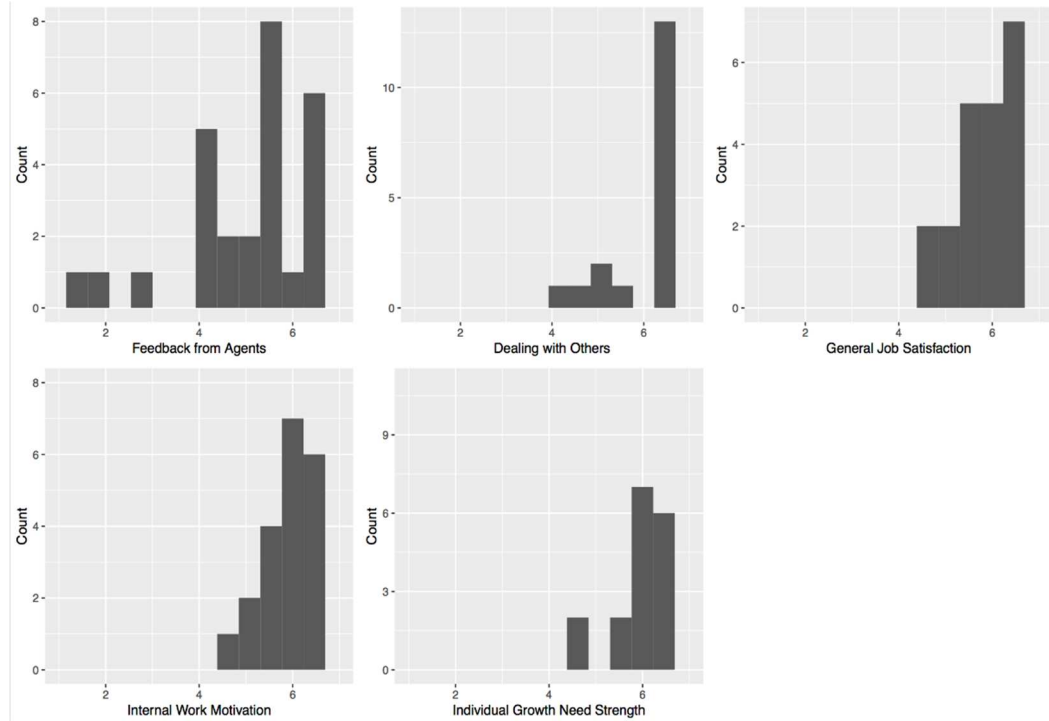


Figure V: Histograms summarizing scores on the additional job factor scores.



SECTION FIVE

COMPREHENSIVE LIST OF REFERENCES

1. Hackman JR, Oldham GR. Development of the job diagnostic survey. *J Appl Psychol* [Internet]. 1975 Apr;60(2):159–70. Available from: <https://dx.doi.org/10.1037/h0076546>
2. Lunenburg Fred C. Motivating by enriching jobs to make them more interesting and challenging. *Int J Bus Manag* [Internet]. 2011 [cited 2019 Feb 7];15(1):1–11. Available from: <http://www.nationalforum.com/Electronic Journal Volumes/Lunenburg, Fred C Motivating by Enriching Jobs IJMBA V15 N1 2011.pdf>
3. Hämmig O. Health and well-being at work: the key role of supervisor support. *SSM - Popul Heal* [Internet]. 2017;3:393–402. Available from: <https://www.sciencedirect.com/science/article/pii/S2352827316301793?via%3Dihub>
4. Knight C, Patterson M, Dawson J. Building work engagement: A systematic review and meta-analysis investigating the effectiveness of work engagement interventions. *J Organ Behav* [Internet]. 2017;38(6):792–812. Available from: <https://eric.ed.gov/?id=ED099580>
5. Ali SAM, Said NA, Yunus NM, Kader SFA, Latif DSA, Munap R. Hackman and Oldham's job characteristics model to job satisfaction. *Procedia - Soc Behav Sci* [Internet]. 2014 May 15 [cited 2019 Feb 7];129:46–52. Available from: <https://www.sciencedirect.com/science/article/pii/S1877042814028286>
6. Hackman JR, Oldham GR. Motivation through the design of work: test of a theory. *Organ Behav Hum Perform* [Internet]. 1976;16(2):250–79. Available from: http://web.mit.edu/curhan/www/docs/Articles/15341_Readings/Group_Performance/Hackman_et_al_1976_Motivation_thru_the_design_of_work.pdf
7. Le Floch B, Bastiaens H, Le Reste JY, Lingner H, Hoffman RD, Czachowski S, et al. Which positive factors determine the GP satisfaction in clinical practice? a systematic literature review. *BMC Fam Pract* [Internet]. 2016;(1):133. Available from: <https://doi.org/10.1186/s12875-016-0524-x>
8. Schrijver I. Pathology in the medical profession?: taking the pulse of physician wellness and burnout. *Arch Pathol Lab Med* [Internet]. 2016;140(9):976–82. Available from: <https://doi.org/10.5858/arpa.2015-0524-RA>
9. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med*. 2012;172(18):1377–85. Available from: <https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/1351351>
10. Hall LH, Johnson J, Watt I, Tsipa A, O'Connor DB. Healthcare staff wellbeing, burnout, and patient safety: a systematic review. *PLoS One* [Internet]. 2016;11(7):e0159015. Available from: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0159015>

11. Xue Y, Ye Z, Brewer C, Spetz J. Impact of state nurse practitioner scope-of-practice regulation on health care delivery: systematic review. *Nurs Outlook* [Internet]. 2016;64(1):71–85. Available from: <http://dx.doi.org/10.1016/j.outlook.2015.08.005>
12. Institute for Healthcare Improvement (IHI). The IHI Triple Aim [Internet]. IHI Triple Aim Initiative. 2014. Available from: <http://www.ihl.org/Topics/TripleAim/Pages/default.aspx>
13. Jacobs B, McGovern J, Heinmiller J, Drenkard K. Engaging employees in well-being: moving from the triple aim to the quadruple aim. *Nurs Adm Q* [Internet]. 2018;42(3):231–45. Available from: <http://insights.ovid.com/crossref?an=00006216-201807000-00009>
14. Bodenheimer T, Sinsky C. From triple to quadruple aim: care of the patient requires care of the provider. *Ann Fam Med* [Internet]. 2014;12(6):573–6. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/25384822>
15. Dyrbye LN, Shanafelt TD, Sinsky CA, Cipriano PF, Bhatt J, Ommaya A, et al. Burnout among health care professionals: a call to explore and address this underrecognized threat to safe, high-quality care. *NAM Perspect* [Internet]. 2017;7(7). Available from: <https://dx.doi.org/10.31478/201707b>
16. Hamasha AAH, Alturki A, Alghofaili N, Alhomaied A, Alsanee F, Aljaghwan F, et al. Predictors and level of job satisfaction among the dental workforce in national guard health affairs. *J Int Soc Prev Community Dent* [Internet]. 2019;9(1):89–93. Available from: https://dx.doi.org/10.4103/jispcd.JISPCD_418_18
17. K Self, C Brickle. Dental therapy education in Minnesota. *Am J Public Health* [Internet]. 2017; 07(S1):S77-S80. Available from: <http://ajph.aphapublications.org/doi/pdf/10.2105/AJPH.2017.303751>
18. Gwozdek AE, Tetrick R, Shaefer HL. The origins of Minnesota’s mid-level dental Practitioner: alignment of problem, political and policy streams. *J Dent Hyg* [Internet]. Available from: <https://jdh.adha.org/content/88/5/292>
19. Blue CM, Kaylor MB. Dental therapy practice patterns in Minnesota: a baseline study. *Community Dent Oral Epidemiol* [Internet]. 2016;44(5):458–66. Available from: <https://dx.doi.org/10.1111/cdoe.12235>
20. Blue CM, Rockwood T, Riggs S. Minnesota dentists? Attitudes toward the dental therapist workforce model. *Healthcare* [Internet]. 2015;3(2):108–13. Available from: <http://dx.doi.org/10.1016/j.hjdsi.2014.07.002>
21. Blue C, Riggs S. Oral health care delivery within the accountable care organization. *J Evid Based Dent Pract* [Internet]. 2016;16(Supplement):52–8. Available from: <http://dx.doi.org/10.1016/j.jebdp.2016.01.016>
22. Lopez N, Blue CM. Socialization of New Dental Therapists on Entering the Profession. *J Dent Educ* [Internet]. 2011;75(5):626–32. Available from: <http://search.ebscohost.com.proxy.seattleu.edu/login.aspx?direct=true&db=ehh&AN=60718789&site=ehost-live&scope=site>

23. Fontana M, González-Cabezas C, de Peralta T, Johnsen D. Dental Education Required for the Changing Health Care Environment. *J Dent Educ* [Internet]. 2017;81(8s):e153–61. Available from: <http://www.jdentaled.org/content/81/8/eS153.full>
24. Singhal A, McKernan SC, Sohn W. Dental public health practice, infrastructure, and workforce in the United States. *Dent Clin North Am* [Internet]. 2018;62(2):155–75. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29478451>
25. Office of Rural Health and Primary Care-Minnesota Department of Health.. Minnesota’s dental therapist workforce. [Internet]. 2016. Available from: <https://www.health.state.mn.us/data/workforce/oral/docs/2016dtb.pdf>
26. Office of Rural Health and Primary Care-Minnesota Department of Health.. Dental therapy toolkit- literature review [Internet]. 2016. Available from: <http://www.health.state.mn.us/divs/orhpc/workforce/emerging/toolkit/dtlit2016.pdf>
27. Office of Rural Health and Primary Care-Minnesota Department of Health. Dental Therapy Toolkit: A resource for potential employers [Internet]. 2017. Available from: <http://www.health.state.mn.us/divs/orhpc/workforce/emerging/index.html>
28. Office of Rural Health and Primary Care-Minnesota Department of Health. Minnesota_DT_Survey [Internet]. 2019. Available from: <https://www.health.state.mn.us/data/workforce/oral/docs/2019dt.pdf>
29. Office of Rural Health and Primary Care-Minnesota Department of Health. Emerging Health Professions- Dental Therapist (DT) and Advanced Dental Therapists (ADT) [Internet]. 2019. Available from: <https://www.health.state.mn.us/data/workforce/oral/docs/2016dtb.pdf>
30. Berthelsen H, Westerlund H, Hakanen JJ, Kristensen TS. It is not just about occupation, but also about where you work. [Internet]. Vol. 45, *Community Dentistry and Oral Epidemiology*. 2017. Available from: <https://dx.doi.org/10.1111/cdoe.12300>
31. Hoff T, Carabetta S, Collinson GE. Satisfaction, burnout, and turnover among nurse practitioners and physician assistants: a review of the empirical literature. *Med Care Res Rev* [Internet]. 2019;76(1):3–31. Available from: doi: 10.1177/1077558717730157
32. Hoff T, Carabetta S, Collinson GE, Chesney ML, Duderstadt KG. States’ progress toward nurse practitioner full practice authority: contemporary challenges and strategies. *J Pediatr Heal Care* [Internet]. 2017;31(6):724–8. Available from: <https://doi.org/10.1016/j.pedhc.2017.09.002>
33. Behmann M, Schmiemann G, Lingner H, Kühne F, Hummers-Pradier E, Schneider N. Job satisfaction among primary care physicians: results of a survey. *Dtsch Arztebl Int* [Internet]. 2012;109(11):193–200. Available from: <https://dx.doi.org/10.3238/arztebl.2012.0193>
34. Le Floch B, Bastiaens H, Le Reste JY, Lingner H, Hoffman RD, Czachowski S, et al. Which positive factors determine the GP satisfaction in clinical practice? A systematic literature review. *BMC Fam Pract* [Internet]. 2016;17(133):1–8. Available from: <https://dx.doi.org/10.1186/s12875-016-0524-x>

35. Poghosyan L, Carthon JMB, Chesney ML, Duderstadt KG, Poghosyan L, Boyd DR, et al. States' Progress Toward Nurse Practitioner Full Practice Authority: Contemporary Challenges and Strategies. *J Pediatr Heal Care* [Internet]. 2017;31(2):724–8. Available from: <https://doi.org/10.1177/1077558717730157>
36. Gabr H, Mohamed N. Job characteristics model to redesign nursing care delivery system in general surgical units. *Acad Res Int* [Internet]. 2012;2(1):199–211. Available from: [http://damanhour.edu.eg/pdf/researches/2012\(2.1-25\).pdf](http://damanhour.edu.eg/pdf/researches/2012(2.1-25).pdf)
37. Maslach C, Leiter MP. Understanding the burnout experience: recent research and its implications for psychiatry. *World Psychiatry* [Internet]. 2016;15(2):103-11. Available from: <https://doi.org/10.1002/wps.20311>
38. Leiter MP, Maslach C. Latent burnout profiles: A new approach to understanding the burnout experience. *Burn Res* [Internet]. 2016;3(4):89–100. Available from: <https://dx.doi.org/10.1016/j.burn.2016.09.001>
39. Schaufeli WB, Leiter MP, Maslach C. Burnout: 35 years of research and practice. *Career Dev Int* [Internet]. 2009;14(3):204–20. Available from: <https://dx.doi.org/10.1108/13620430910966406>
40. Faraji O, Ramazani AA, Hedaiati P, Aliabadi A, Elhamirad S, Valiee S. Relationship between job characteristics and organizational commitment: a descriptive analytical study. *Iran Red Crescent Med J* [Internet]. 2015;17(11):e19815. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26734472>
41. Steyn R, Vawda N. Job characteristics: their relationship to job satisfaction, stress and depression. *J Psychol Africa* [Internet]. 2014;24(3):281–4. Available from: <https://dx.doi.org/10.1080/14330237.2014.906076>
42. Shanafelt TD, Hasan O, Dyrbye LN, Sinsky C, Satele D, Sloan J, et al. Changes in burnout and satisfaction with work-life balance in physicians and the general US working population between 2011 and 2014. *Mayo Clin Proc* [Internet]. 2019;94(9):1681–94. Available from: <https://doi.org/10.1016/j.mayocp.2015.08.023>
43. Osborn M, Satrom J, Schlenker A, Hazel M, Mason M, Hartwig K. Physician assistant burnout, job satisfaction, and career flexibility in Minnesota. *JAAPA Off J Am Acad Physician Assist* [Internet]. 2019;32(7):41–7. Available from: https://journals.lww.com/jaapa/Fulltext/2019/07000/Physician_assistant_burnout,_job_satisfaction,_and.9.aspx
44. Reith TP. Burnout in United States healthcare professionals: a narrative review. *Cureus* [internet]. 2018;10(12):e3681. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6367114/>
45. Shetty BR, Gujarathi R. Applying job characteristics model to nursing profession. 2014;2(1):6–11. Available from: <http://ijanm.com/HTMLPaper.aspx?Journal=International Journal of Advances in Nursing Management=2014-2-1-3>

46. Park et al. To what extent are state scope of practice laws related to nurse practitioners' day-to-day practice autonomy? *Med Care Res Rev* [Internet]. 2018;75(1):66-87. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/29148318>
47. Poghosyan L, Carthon JMB. The untapped potential of the nurse practitioner workforce in reducing health disparities. *Policy Polit Nurs Pract* [Internet]. 2017;18(2):84-94. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/28766986>
48. Barnett G. In Pursuit of the Fourth Aim in Health Care: The Joy of Practice. *Med Clin North Am* [Internet]. 2017;101(5):1031–40. Available from: <https://dx.doi.org/10.1016/j.mcna.2017.04.014>
49. Jacobs B, McGovern J, Heinmiller J, Drenkard K, Havens DS, Gittel JH, et al. Achieving the Quadruple Aim. The Triple Aim is great, but there's something it leaves out. *Health Manag Technol* [Internet]. 2015 Feb;48(3):132–40. Available from: <https://dx.doi.org/10.1097/01.NURSE.0000476228.88008.53>
50. Luzzi L, Spencer AJ. Job satisfaction of the oral health labour force in Australia. *Aust Dent J* [Internet]. 2011;56(1):23–32. Available from: <https://dx.doi.org/10.1111/j.1834-7819.2010.01282.x>
51. Singh PK. Job satisfaction among dental therapists in South Africa. *J Public Health Dent* [Internet]. 2014;74(1):28–33. Available from: <https://dx.doi.org/10.1111/j.1752-7325.2012.00363.x>
52. Bakar AA, Nor NAM, Ab□Murat N, Jaafar N. Job satisfaction and perceived future roles of Malaysian dental therapists: findings from a national survey. *Int J Dent Hyg* [Internet]. 2015;13(3):199–205. Available from: <http:https://doi.org/10.1111/idh.12095>
53. Vick B. Career satisfaction of Pennsylvanian dentists and dental hygienists and their plans to leave direct patient care. *J Public Health Dent* [Internet]. 2016;76:113–21. Available from: <https://doi.org/10.1111/jphd.12119>
54. Candell A, Engstrom M. Dental hygienists' work environment: motivating, facilitating, but also trying. *Int J Dent Hyg* [Internet]. 2010;8(3):204–12. Available from: <https://doi.org/10.1111/j.1601-5037.2009.00420.x>
55. Sanders MJ, Turcotte CM. Occupational stress in dental hygienists. *Work* [Internet]. 2010;35(4):455–65. Available from: <https://dx.doi.org/10.3233/WOR-2010-0982>
56. Csikar JI, Bradley S, Williams SA, Godson JH, Rowbotham JS. Dental therapy in the United Kingdom: part 4. teamwork - is it working for dental therapists? *Br Dent J* [Internet]. 2009;207(11):529–36. Available from: <http://dx.doi.org/10.1038/sj.bdj.2009.1104>
57. Nash DA, Friedman JW, Mathu-Muju KR, Robinson PG, Satur J, Moffat S, et al. A review of the global literature on dental therapists. *Community Dent Oral Epidemiol* [Internet]. 2014;42(1):1–10. Available from: <https://dx.doi.org/10.1111/cdoe.12052>
58. Turner S, Ross M. Direct access: how is it working? *Br Dent J* [Internet]. 2017;222(3):191–7. Available from: <https://dx.doi.org/10.1038/sj.bdj.2017.123>

59. Ross MK, Turner S, Ibbetson RJ. The impact of General Dental Council registration and continuing professional development on UK dental care professionals. *Br Dent J* [Internet]. 2012;213(8):400–1. Available from: <http://dx.doi.org/10.1038/sj.bdj.2012.664>
60. Godson JH, Williams SA, Csikar JI, Bradley S, Rowbotham JS. Dental therapy in the United Kingdom: part 2. A survey of reported working practices. *Br Dent J* [Internet]. 2009;207(9):417–23. Available from: <http://10.0.4.14/sj.bdj.2009.962>
61. Turner S, Ross MK, Ibbetson RJ. Dental hygienists and therapists: How much professional autonomy do they have? How much do they want? Results from a UK survey. *Br Dent J*. 2018;62(2):155–75. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/21617648>
62. Mathu-Muju KR. Dental therapists provide technically competent clinical care when performing irreversible restorative procedures. *J Evid Based Dent Pract* [Internet]. 2014;14(1):25–7. Available from: <http://dx.doi.org/10.1016/j.jebdp.2014.01.006>
63. Dyer TA, Humphris G, Robinson PG. Public awareness and social acceptability of dental therapists. *Br Dent J*. 2010;208(1):16–7. Available from: <https://www.nature.com/articles/sj.bdj.2010.1>
64. Dyer TA, Owens J, Robinson PG. What matters to patients when their care is delegated to dental therapists? *Br Dent J* [Internet]. 2013;214(6):302–3. Available from: <https://www.nature.com/articles/sj.bdj.2013.275>
65. Sun N, Burnside G, Harris R. Patient satisfaction with care by dental therapists. *Br Dent J* [Internet]. 2010;208(5):212–3. Available from: <https://www.nature.com/articles/sj.bdj.2010.209>
66. Barnes E, Bullock A, Cowpe J, Moons K, Warren W, Hannington D, et al. General dental practices with and without a dental therapist: a survey of appointment activities and patient satisfaction with their care. *Br Dent J* [Internet]. 2018;225(1):53–8. Available from: <http://www.nature.com/doifinder/10.1038/sj.bdj.2018.522>
67. Self KD, Lopez N, Blue CM. Dental school faculty attitudes toward dental therapy: a four-year follow-up. *J Dent Educ* [Internet]. 2017;81(5):517–25. Available from: <http://www.jdentaled.org/content/81/5/517>
68. Turner S, Ross MK, Ibbetson RJ. Job satisfaction among dually qualified dental hygienist-therapists in UK primary care: a structural model. *Br Dent J* [Internet]. 2011;210(4):166–7. Available from: <http://dx.doi.org/10.1038/sj.bdj.2011.50>
69. World Health Organization. WHO | Mental health in the workplace. [Internet]. World Health Organization; 2019. Available from: https://www.who.int/mental_health/in_the_workplace/en/
70. Ephrem H, Self KD, Blue CM. Introducing and evaluating intraprofessional team-based care delivery in a dental school clinic: A pilot study. *J Dent Educ* [Internet]. 2018;82(9):980–8. Available from: <https://www.ncbi.nlm.nih.gov/pubmed/30173195>

71. Self KD, Lopez N, Blue CM, Self KD, Yang YT, Chen B, et al. Dental therapists: a solution to a shortage of dentists in underserved communities? *J Dent Educ* [Internet]. 2017;62(May):285–8. Available from: <http://dx.doi.org/10.1016/j.jebdp.2016.01.016>
72. Hackman JR. Work redesign and motivation. *Prof Psychol Res Pract* [Internet]. 1980;11(3):445–55. Available from: <https://dx.doi.org/10.1037/0735-7028.11.3.445>
73. Oldham GR, Richard Hackman J. Not what it was and not what it will be: the future of job design research. *J Organ Behav* [Internet]. 2010;155(2–3):463–79. Available from: <https://dx.doi.org/10.1002/job.678>
74. Jerkovic-Cosic K. Job satisfaction and job content in Dutch dental hygienists. *Int J Dent Hyg*. [Internet]. 2012;10(3):155-62. Available from: <https://onlinelibrary-wiley-com.ezp3.lib.umn.edu/doi/full/10.1111/j.1601-5037.2012.00567.x>
75. Flynn PM, Luthra M, Blue CM. Did intraprofessional training with dental therapists affect dental students' attitudes toward caring for the underserved? *J Dent Educ* [Internet]. 2017;81(2):162–8. Available from: <http://www.jdentaled.org.ezp3.lib.umn.edu/content/81/2/162.long>

SECTION 6

APPENDICES

Appendix A

IRB Response

EXEMPTION DETERMINATION

May 9, 2019

Cyndee Stull

651-324-9099
stul0045@umn.edu

Dear Cyndee Stull:

On 5/9/2019, the IRB reviewed the following submission:

Type of Review:	Initial Study
Title of Study:	Job Satisfaction Levels Among Minnesota Dental Therapists
Investigator:	Cyndee Stull
IRB ID:	STUDY00006354
Sponsored Funding:	None
Grant ID/Con Number:	None
Internal UMN Funding:	Departmental funding : The University of Minnesota Division of Dental Hygiene MSDH student thesis scholarship.
Fund Management Outside University:	None
IND, IDE, or HDE:	None

Documents Reviewed with this Submission:	<ul style="list-style-type: none"> • Nancy Hamson, Category: IRB Protocol; • IRB-Original JDS survey information.pdf, Category: Other; • Nancy Hamson, Category: Other; • Nancy Hamson, Category: Consent Form; • IRB Gift Card Drawing Contact Information.docx, Category: Other; • IRB Qualtrics April 25.docx, Category: Other; • C. Stull CITI Social Behavioral Basic Course Certificate, Category: Other;
--	--

The IRB determined that this study meets the criteria for exemption from IRB review. To arrive at this determination, the IRB used “WORKSHEET: Exemption (HRP-312).” If you have any questions about this determination, please review that Worksheet in the [HRPP Toolkit Library](#) and contact the IRB office if needed.

This study met the following category(ies) for exemption:

- (2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observation of public behavior (including visual or auditory recording) if at least one of the following criteria is met: (ii) Any disclosure of the human subjects’ responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects’ financial standing, employability, educational advancement, or reputation

Ongoing IRB review and approval for this study is not required; however, this determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit a Modification to the IRB for a determination.

In conducting this study, you are required to follow the requirements listed in the Investigator Manual (HRP-103), which can be found by navigating to the [HRPP Toolkit Library](#) on the IRB website.

For grant certification purposes, you will need these dates and the Assurance of Compliance number which is FWA00000312 (Fairview Health Systems Research FWA00000325, Gillette Children's Specialty Healthcare FWA00004003).

Sincerely,

Dylan Olson, CIP
IRB Analyst

Appendix B

Information Sheet with Consent

The following is a short summary to help you decide whether or not to be a part of this research study. We declare no financial interest in this study. The purpose of this survey is to assess if Minnesota dental therapists (DTs) experience job satisfaction and the correlates associated with job satisfaction levels. Job satisfaction pertains to the degree employees feel positively or negatively about their jobs. Job satisfaction levels among U.S. DT's skillset has not yet been comprehensively studied. Knowledge gained from this study may inform current and future employers of dental therapists, dental therapy educational programs, as well as the health care system at large. Factors related to low levels of job satisfaction can subsequently be addressed enhancing DTs job satisfaction.

You are invited to participate in a research study to investigate Minnesota dental therapists' job satisfaction and the correlates associated with job satisfaction levels. You were selected as a possible participant because you are a licensed dental therapist in Minnesota. We ask that you read this form and ask any questions you may have before agreeing to be in the study. We cannot promise any benefits to you or others from taking part in this research. However, possible benefits may include an increase in job satisfaction, the ability to inform current and future employers about the benefits of dental therapy, and the awareness to promote dental therapy educational programs, as well as Minnesota's health care system at large.

This study is being conducted by: Nancy Hamson, Master of Science in Dental Hygiene student. Her advisor is Cynthia Stull, Director, MSDH Program and Associate Clinical Professor in the Division of Dental Hygiene, Department of Primary Care, School of Dentistry, University of Minnesota.

Procedures: If you agree to be in this study, we would ask you to complete the online survey which should take about 10 minutes. If you agree to take part in this research study, we will compensate you for your time and effort. As an incentive, DTs completing the survey will be given the opportunity to be entered in a drawing to win one of five \$20 Target gift cards.

Confidentiality: The records of this study will be kept private. In any sort of report we might publish, we will not include any information what will make it possible to identify

a subject. When the results are published, only combined data will be reported. Research records will be stored securely, and only researchers will have access to the records.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. Minimal risks may be encountered. Some questions may elicit negative memories or be uncomfortable. If you decide to participate, you are free not to answer any questions or withdraw at any time without affecting those relationships.

Contacts and Questions: The researcher(s) conducting this study is (are): Nancy Hamson and Cynthia Stull. If you have questions, you are encouraged to contact them at Moos Tower, Division of Dental Hygiene, 515 Delaware St., Minneapolis, Minnesota, 55455; Nancy Hamson, 612-804-4311, hamso010@umn.edu. Cyndee Stull, 612-626-3412, stul0045@umn.edu. If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact Research Subjects' Advocate Line D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; 612-625-1650. This research has been reviewed and approved by an Institutional Review Board (IRB) within the Human Research Protections Program (HRPP). To share feedback privately with the HRPP about your research experience, call the Research Participants' Advocate Line at 612-624-4490.

Consent: Choosing your consent option before you participate in the survey administered by Qualtrics, documents your consent to take part in this research.

Your time and input are greatly appreciated,
Nancy Hamson BSDH, LDH
MSDH Graduate Student

If you decide to participate, please select "I consent" below and begin the study survey.

Appendix C

First Postcard

June 6, 2019

Dear Minnesota Dental Therapist,

My name is Nancy Hamson and I am a Master of Science in Dental Hygiene student at the University of Minnesota School of Dentistry.

Job satisfaction pertains to the degree employees feel positively or negatively about their jobs. Job satisfaction levels among U.S DT's skillset has not yet been comprehensively studied. To examine dental therapist job satisfaction levels and the associated correlates, the Division of Dental Hygiene at the University of Minnesota is asking for your cooperation in the completion of a job satisfaction survey. Knowledge gained from this study may inform current and future employers of dental therapists, dental therapy educational programs, as well as our health care system at large. Factors related to low levels of job satisfaction can subsequently be addressed, therefore, enhancing DTs job satisfaction.

Your participation is voluntary, however, please understand that your input is essential to the success of this research project. The survey should take no longer than 10 minutes to complete. If you decide to participate, access the survey link below and please select "I consent" to begin the study survey.

Thank you in advance for your cooperation. Please feel free to contact me with any questions you may have at 612-804-4311 or hamso010@umn.edu or my advisor Cynthia Stull at 612-626-3412 or stul0045@umn.edu.

Kind regards,

Nancy Hamson LDH, BSDH

MSDH Graduate Student

Appendix D

Second Postcard

June 21, 2019

Dear Minnesota Dental Therapist,

My name is Nancy Hamson and I am a Master of Science in Dental Hygiene student at the University of Minnesota School of Dentistry. Two weeks ago, you received my first survey request. As we both know, summer can be busy! Hopefully you have a few moments available now to consider completing this second survey request. This information will be very helpful in determining if Minnesota dental therapist's (DT's) experience job satisfaction and the correlates associated with job satisfaction levels.

Job satisfaction pertains to the degree employees feel positively or negatively about their jobs. Job satisfaction levels among U.S DT's skillset has not yet been comprehensively studied. Knowledge gained from this study may inform current and future employers of dental therapists, dental therapy educational programs, as well as our health care system at large. Factors related to low levels of job satisfaction can subsequently be addressed enhancing DTs job satisfaction.

To examine dental therapist job satisfaction levels and the associated correlates, the Division of Dental Hygiene at the University of Minnesota is asking for your cooperation in the completion of job satisfaction survey. You were selected as a possible participant because you are a licensed dental therapist in Minnesota. The survey should take no longer than 10 minutes to complete.

Your participation is voluntary, however, please understand that your input is essential to the success of this research project. The records of this study will be kept confidential. The code number on the survey is used for tracking purposes only. When the results are published, only combined data will be reported. If you decide to participate, please select "I consent" to begin the study survey.

Thank you in advance for your cooperation. Please feel free to contact me with any questions you may have at 612-804-4311 or hamso010@umn.edu or my advisor Cynthia Stull at 612-626-3412 or stul0045@umn.edu.

Kind regards,

Nancy Hamson, LDH, BSDH, MSDH Graduate Student

Appendix E

Final Postcard

July 10, 2019

Final Request

Dear Minnesota Dental Therapist,

My name is Nancy Hamson and I am a Master of Science in Dental Hygiene student at the University of Minnesota School of Dentistry.

Job satisfaction pertains to the degree employees feel positively or negatively about their jobs. Job satisfaction levels among U.S DT's skillset has not yet been comprehensively studied. To examine dental therapist job satisfaction levels and the associated correlates, the Division of Dental Hygiene at the University of Minnesota is asking for your cooperation in the completion of a job satisfaction survey. Knowledge gained from this study may inform current and future employers of dental therapists, dental therapy educational programs, as well as our health care system at large. Factors related to low levels of job satisfaction can subsequently be addressed, therefore, enhancing DTs job satisfaction.

Your participation is voluntary, however, please understand that your input is essential to the success of this research project. The survey should take no longer than 10 minutes to complete. If you decide to participate, access the survey link below and please select "I consent" to begin the study survey.

Thank you in advance for your cooperation. Please feel free to contact me with any questions you may have at 612-804-4311 or hamso010@umn.edu or my advisor Cynthia Stull at 612-626-3412 or stul0045@umn.edu.

Kind regards,

Nancy Hamson LDH, BSDH

MSDH Graduate Student

Appendix F

Demographic Questions with Original JDS Short Form Survey

Minnesota DT Survey

Q1 KEY INFORMATION ABOUT THIS RESEARCH STUDY

The following is a short summary to help you decide whether or not to be a part of this research study. We declare no financial interest in this study. The purpose of this survey is to assess if Minnesota dental therapists (DTs) experience job satisfaction and the correlates associated with job satisfaction levels. Job satisfaction pertains to the degree employees feel positively or negatively about their jobs. Job satisfaction levels among U.S DT's skillset has not yet been comprehensively studied. Knowledge gained from this study may inform current and future employers of dental therapists, dental therapy educational programs, as well as the health care system at large. Factors related to low levels of job satisfaction can subsequently be addressed enhancing DTs job satisfaction.

You are invited to participate in a research study to investigate Minnesota dental therapists' job satisfaction and the correlates associated with job satisfaction levels. You were selected as a possible participant because you are a licensed dental therapist in Minnesota. We ask that you read this form and ask any questions you may have before agreeing to be in the study. We cannot promise any benefits to you or others from taking part in this research. However, possible benefits may include an increase in job satisfaction, the ability to inform current and future employers about the benefits of dental therapy, and the awareness to promote dental therapy educational programs, as well as Minnesota's health care system at large.

This study is being conducted by: Nancy Hamson, Master of Science in Dental Hygiene student. Her advisor is Cyndee Stull, Director, MSDH Program and Associate Clinical Professor in the Division of Dental Hygiene, Department of Primary Care, School of Dentistry, University of Minnesota.

Procedures: If you agree to be in this study, we would ask you to complete the online survey which should take about 10 minutes. If you agree to take part in this research study, we will compensate you for your time and effort. As an incentive, DTs completing the survey will be given the opportunity to be entered in a drawing to win one of five \$20 Target gift cards.

Confidentiality: The records of this study will be kept private. In any sort of report we might publish, we will not include any information what will make it possible to identify a subject. When the results are published, only combined data will be reported. Research records will be stored securely and only researchers will have access to the records.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. Minimal risks may be encountered. Some questions may elicit negative memories or be uncomfortable. If you decide to participate, you are free not to answer any questions or withdraw at any time without affecting those relationships.

Contacts and Questions: The researcher(s) conducting this study is (are): Nancy Hamson and Cyndee Stull. If you have questions, you are encouraged to contact them at Moos Tower, Division of Dental Hygiene, 515 Delaware St., Minneapolis, Minnesota, 55455; Nancy Hamson, 612-804-4311, hamso010@umn.edu. Cyndee Stull, 612-626-3412, stul0045@umn.edu. If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), you are encouraged to contact Research Subjects' Advocate Line D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; 612-625-1650. This research has been reviewed and approved by an Institutional Review Board (IRB) within the Human Research Protections Program (HRPP). To share feedback privately with the HRPP about your research experience, call the Research Participants' Advocate Line at 612-624-4490.

Consent: Choosing your consent option before you participate in the survey administered

by Qualtrics, documents your consent to take part in this research. Your time and input are greatly appreciated,

Nancy Hamson BSDH, LDH
MSDH Graduate Student

If you decide to participate, please select "I consent" below and begin the study survey.

Q2 Choose your consent option below.

- I Consent
- I do NOT consent (SKIP TO END OF SURVEY)

Q3 What is your age?

- 30 and younger
- 31-40
- 41-50
- 51 or older

Q4 What is your gender?

- Female
- Male
- Non-binary/third gender
- Prefer not to answer

Q5 Are you of Hispanic, Latino, or Spanish origin?

Yes

No

Q6 Which best describes your ethnicity?

American Indian or Alaska Native

Asian

Black or African American

Native Hawaiian or Pacific Islander

Multiracial

White

Other

Q7 Are you fluent in another language besides English?

Yes

No

Q8 What is your current employment status? Check all that apply

- Employed full time (more than 31 hours/week)
- Employed part-time (30 hours or less/week)
- Employed looking for work
- Unemployed looking for work
- Unemployed NOT looking for work
- Volunteer (as a DT)
- Other

Q9 What type of location(s) describes where you practice? Check all that apply.

- Private dental practice
- Community non-profit clinic
- Mobile dental unit/Teledentistry
- Hospital or Long-term care facility
- Federally Qualified Health Center (FQHC)
- Education/Research
- Other

Q10 Which best describes how you are compensated?

- Base plus commission
- Commission only
- Hourly
- Salary
- Other

Q11 What types of licensure/certification describes how you practice in Minnesota?
Check all that apply.

- DT -Dually licensed (DH/DT)
- DT-NOT dually licensed (DT)
- Advanced Dental Therapist (ADT) certification completed
- ADT certification in process
- NOT interested in ADT certification

Q12 In which Minnesota county or counties do you practice? (TEXT BOX)

Q13 On the following pages you will find several different questions about your job. Specific instructions are given at the start of each section. Please read them carefully. It should take no more than 10 minutes to complete the entire questionnaire.

Section 1:

This part of the questionnaire asks you to describe your job, as OBJECTIVELY as you can. Please do NOT use this part of the questionnaire to show how much you like/dislike

your job. Questions about that will come later. Instead, try to make your descriptions as accurate and as objective as you possibly can

These questions are designed to obtain YOUR perceptions of your job and YOUR reactions to it.

Q1: To what extent does your job require you to work closely with other people?

Very little; dealing with other people is not at all necessary in doing the job.	Moderately; some dealing with others is necessary.	Very much; dealing with other people is an absolutely and crucial part of the job.
--	--	--

1 2 3 4 5 6 7



Q2: How much autonomy is there in your job? That is, to what extent does your job permit you to decide on your own how to go about doing the work?

Very little; the job gives me almost no personal "say" about how and when the work is done.	Moderate autonomy; many things are standardized and not under my control, but I can make some decisions about the work.	Very much; the job gives me almost complete responsibility for deciding how and when the work is done.
---	---	--

1 2 3 4 5 6 7



Q3: To what extent does your job involves doing a "whole" and identifiable piece of work? That is, is the job a complete piece of work that has an obvious beginning and end? Or is it only a small part of the overall piece of work, which is finished by other people?

My job is only a tiny part of the overall piece of work; the results of my activities cannot be seen in the final service.	My job is a moderate-sized "chunk" of the overall piece of work; my own contribution can be seen in the final outcome.	My job involves doing the whole identifiable piece of work, from start to finish; the results of my activities are easily seen in the final service.
--	--	--

1 2 3 4 5 6 7



Q4: How much variety is there in your job? That is, to what extent does your job require you to do many different things at work, using a variety of your skill and talents?

Very little; my job requires me to do the same routine things over and over again.	Moderate variety	Very much; my job requires me to do many different things using a number of different skills and talents.
--	------------------	---

1 2 3 4 5 6 7



Q5: In general, how significant or important is your job? That is, are the results of your work likely to significantly affect the lives or well-being of others?

Not very significant; the outcomes of my work are NOT likely to have important effects on other people.	Moderately significant	Highly significant; the outcomes of my work can affect other people in very important ways.
---	------------------------	---

1 2 3 4 5 6 7



Q6: To what extent do managers or co-workers let you know how well you are doing in your job?

Very little; people almost never let me know how well I am doing.	Moderately; sometimes people give me "feedback;" other times they may not.	Very much; managers or co-workers provide me with almost constant "feedback" about how well I am doing.
---	--	---

1 2 3 4 5 6 7



Q7: To what extent does "doing the job itself" provide you with information about your work performance? That is, does the actual "work itself" provide clues about how well you are doing-aside from any "feedback" co-workers or supervisors may provide?

Very little; the job itself is set up so I could work forever without finding out how well I am doing.	Moderately; sometimes doing the job provides "feedback" to me; sometimes it does not.	Very much; the job is set up so that I get almost constant "feedback" as I work about how well I am doing.
--	---	--

1 2 3 4 5 6 7



Section 2:

Listed below are a number of statements which could be used to describe a job. You are to indicate whether each statement is an accurate or an inaccurate description of your job. Once again, please try to be as objective as you can, regardless of whether you like or dislike your job.

Q8	Very Inaccurate	Mostly Inaccurate	Slightly Inaccurate	Uncertain	Slightly Accurate	Moderately Accurate	Very Accurate
1. The job requires me to use a number of complex or high-level skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The job requires a lot of cooperative work with other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The job is arranged so that I do NOT have the chance to do an entire piece of work from beginning to end.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Just doing the job required by the job provides many chances for me to figure out how well I am doing.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The job is quite simple and repetitive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The job can be done adequately by a person working alone-without talking or checking with other people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. The supervisors and co-workers on this job almost NEVER give me feedback about how well I am doing in my work.

8. This job is one where a lot of other people can be affected by how well work gets done.

9. The job denies me any chance to use my professional initiative or judgement in carrying out the work.

10. Supervisors often let me know how well they think I am performing the job.

11. The job provides me the chance to completely finish the pieces of work.

12. The job itself provides very few clues about whether or not I am performing well.

13. The job gives me considerable opportunity for independence and freedom on how I do the work.

14. The job itself is NOT very significant or important in the broader scheme of things.

Section 3:

Now please indicate how you personally FEEL about your job.

Each of the statements below is something that a person might say about his or her job.

You are to indicate on your own, personal FEELINGS about your job by marking how much you agree with each of the statements.

Q9	Disagree Strongly	Disagree	Disagree Slightly	Neutral	Agree Slightly	Agree	Strongly agree
1. My opinion of myself goes up when I do this job well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Generally speaking, I am very satisfied with this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I feel a great sense of personal satisfaction when I do this job well.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I frequently think of quitting this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I feel bad and unhappy when I discover that I have performed poorly on this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I am generally satisfied with the kind of work I do in this job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. My own feelings generally are NOT affected much one way or the other by how well I do on this job.

Section 4:

Now please indicate how SATISFIED you are with each aspect of your job listed below.

Q10	Extremely Dissatisfied	Dissatisfied	Slightly Dissatisfied	Neutral	Slightly Satisfied	Satisfied	Extremely Satisfied
1. The amount of job security I have.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. The amount of pay and benefits I receive.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. The amount of personal growth and development I get in doing my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. The people I talk to and work with on my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. The degree of respect and fair treatment I receive from my boss.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. The feeling of worthwhile accomplishment I get from doing my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. The chance I get to know other people while on the job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. The amount of support and guidance I receive from my supervisor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. The degree to which I am fairly paid for what I contribute to this organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. The amount of independent thought and action I can exercise in my job.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. How secure things look for me in the future in this organization.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. The chance to help other people while at work.

13. The amount of challenge in my job.

14. The overall quality of the supervision I receive in my work.

Section 5:

Listed below are a number of characteristics which could be present on any job. People differ about how much they would like to have each one present in their own job. We are interested in learning how much would you personally would LIKE to have each one present in your job.

Using the scale below, please indicate the DEGREE to which you WOULD like to have each characteristic present in your job.

NOTE: The numbers on this scale are different from those used in the previous scales.

Q11	Would like having this only a moderate amount (or less)		Would like having this very much		Would like having this EXTREMELY much	
	4	5	6	7	8	9 10
1. High respect and fair treatment from my supervisor.						
2. Stimulating and challenging work.						
3. Chance to exercise independent thought and action in my job.						
4. Great job security						
5. Very friendly co-workers.						
6. Opportunities to learn new things from my work.						
7. High salary and good benefits.						
8. Opportunities to be creative and imaginative in my work.						
9. Quick promotions						
10. Opportunities for personal growth and development in my job.						
11. A sense of worthwhile accomplishment in my work.						

Q12 OPTIONAL: If you would like to be entered into the drawing to win one of five \$20 Target gift cards, please provide your name (first and last) and an email address so that the student investigator can contact you and get the gift card to you. Your personal

information will not be used for any other purpose besides contacting you if you win a gift card.

Type your first name, last name, and email (**OPTIONAL**) if you want to be entered for the drawing. _____

Appendix G: The JDS Short Form Scoring Key

The Short Form of the Job Diagnostic Survey (JDS) measures several characteristics of jobs, the reactions of the respondents to their jobs, and the growth need strength of the respondents. Each variable measured by the JDS Short Form is listed below, along with (a) a one or two sentence description of the variable, and (b) a list of the questionnaire items which are averaged to yield a summary score for the variable.

1. Job Dimensions: Objective characteristics of the job itself.

- A. Skill Variety: The degree to which a job requires a variety of different activities in carrying out the work, which involves the use of a number of different skills and talents of the employee.

Average the following items: Section One (Q#4); Section Two (Q#1); Q#5 (reversed scoring--i.e., subtract the number entered by the respondent from 8).

- B. Task Identity: The degree to which the job requires the completion of a "whole" and identifiable piece of work--i.e., doing a job from beginning to end with a visible outcome.

Average the following items: Section One (Q#3), Section Two (Q#11), (Q#3 reversed scoring)

- C. Task Significance: The degree to which the job has a substantial impact on the lives or work of other people--whether in the immediate organization or in the external environment.

Average the following items: Section One (Q#5), Section TWO (Q #8), (Q#14 reversed scoring)

- D. Autonomy: The degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling his or her work and in determining the procedures to be used in carrying it out.

Average the following items: Section One (Q#2); Section Two (Q#13); (Q#9 reversed scoring)

- E. Feedback from the Job Itself: The degree to which carrying out the work activities required by the job results in the employee obtaining information about the effectiveness of his or her performance.

Average the following items: Section One (Q#7); Section Two (Q#4); (#12 reversed scoring)

- F. Feedback from Agents: The degree to which the employee receives information about his or her performance effectiveness from supervisors or

from coworkers. (This construct is NOT a job characteristic per. se and is included only to provide information supplementary to construct (E) above).

Average the following items: Section One (Q#6); Section Two (Q#10); (Q#7 reversed scoring)

G. Dealing with Others: The degree to which the job requires the employee to work closely with other people (whether other organization members or organizational "clients").

Average the following items: Section One (Q#1); Section Two (Q#2); (Q#6 reversed scoring)

2. Affective Responses to the Job: The private, affective reactions or feelings an employee gets from working in his or her job.

A. General Satisfaction: An overall measure of the degree to which the employee is satisfied and happy in his or her work.

Average the following items from Section Three: (Q#2); (Q#6); (Q#4 reversed scoring)

B. Internal Work Motivation: The degree to which the employee is self-motivated to perform effectively on the job.

Average the following items from Section Three: (Q#1); (Q#3); (Q#5); (Q#7 reversed scoring)

C. Specific Satisfaction: These short scales tap several specific aspects of the employee's job satisfaction.

C1. "Pay" Satisfaction. **Average items #2 and #9 of Section Four.**

C2. "Security" Satisfaction. **Average items #1 and #11 of Section Four.**

C3. "Social" Satisfaction. **Average items #4, #7, and #12 of Section Four.**

C4. "Supervisory" Satisfaction. **Average Items #5, #8, and #14 of Section Four.**

C5. "Growth" Satisfaction. **Average items #3, #6, #10, and #13 of Section Four.**

3. Individual Growth Needs Strength: This scale taps the degree to which an employee has strong vs. weak desire to obtain "growth" satisfaction from his or her work.

Average the six items from Section Five listed below. Before averaging, subtract 3 from each item score; this will result in a summary scale ranging from one to seven. The items are: 02, #3, #6, #8, #10, #11.

4. **Motivating Potential Score (MPS):** A score reflecting the potential of a job for eliciting positive internal work motivation on the part of employees (especially those with a high desire for growth need satisfaction). Using all five core job characteristics, the formula for the MPS is:

$$\text{MPS} = \frac{(\text{Skill variety} + \text{Task identity} + \text{Task significance})}{3} \times \text{Autonomy} \times \text{Feedback}$$