

# Preferences for dental decisional control and associations with quality of life among third molar patients attending public dental services

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**Objectives:** To explore: (1) the prevalence of dental decisional control preferences (DDCP) among third molar (TM) patients attending public dental services and associated individual's characteristics, and (2) the association between DDCP and quality of life (QoL). **Method:** Participants were adult public dental patients with internet access referred for TM consultation. Collected data included patients' socio-demographic variables, the Control Preferences Scale (CPS), the Oral Health Impact Profile (OHIP-14) and the EuroQol EQ-5D-5L. **Results:** Participants ( $n=163$ ) were mainly females (73.6%) with a mean age of 26.2 years ( $SD=8.3$ ). Most participants preferred an active DDCP ( $n=71$ , 44.1%) or a collaborative DDCP ( $n=60$ , 37.3%) while a minority preferred a passive DDCP ( $n=30$ , 18.6%). Gender ( $P=.05$ ) and education ( $P=.03$ ) were associated with DDCP. In a multinomial logistic regression model for DDCP, females were more likely to have an active DDCP ( $OR=2.73$ ,  $P=.04$ ) as were participants who had tertiary education ( $OR=2.72$ ,  $P=.04$ ). In a linear regression model for OHIP-14, active ( $P=.05$ ) and collaborative DDCP ( $P=.04$ ) were associated with less impact on oral health-related QoL. **Conclusion:** Patients attending public dental services preferred to be involved (either actively or collaboratively) in dental treatment decision-making. Being a female and/or having tertiary education were associated with an active DDCP. The positive association between patients' involvement in decision-making and oral health-related QoL might support the benefit for enhancing patients' involvement in decision-making.

**Keywords:** Decision-making, health outcomes, oral health-related quality of life, OHRQoL, health-related quality of life, HRQoL, OHIP-14, EQ-5D-5L and the Control Preference Scale, CPS.

## Introduction

Dental decision-making is an interactive form of dentist-patient communication and information sharing. It aims to allow an evidence-based treatment choice that respects patients' beliefs and values. Over time, the health professional-patient relationship in clinical decision-making has changed from a paternalistic to an informed relationship, with the concept of shared decision-making (SDM) being officially introduced in the United States in 1998 (Lipkin, 2013; The President's Advisory Commission on Consumer Protection and Quality in the Health Care Industry, 1998). However, the implementation of SDM into clinical practice within Australia is facing some challenges (Hoffmann *et al.*, 2014). Several factors contribute to SDM, including the current clinical practice, clinical uncertainty and patient preference for decisional control (Mulley, 2006). Patient preferences for decisional control might be in the form of being active, collaborative or passive (Degner *et al.*, 1997). Actively involving patients in decision-making is becoming necessary not only for moral reasons but also due to the practicing of an evidence-based health care and the increase in available treatment options (Entwistle, 2009). This has made the patient's involvement in treatment decisions a cornerstone for providing patient-centered care (Lucia, 2016).

However, there are limited studies that explore preferences for decisional control in dental patients.

Decisional control preferences are known to be associated with some individual characteristics. In the medical field, educational attainment, increase in age (outside age extremes) and being a female have been found to be associated with an active decisional control preference (DCP) (Lucia, 2016). In contrast, low-income patients were more likely to have a passive DCP (Lucia, 2016) since the majority of them are less educated and consequently have a low health literacy. Accordingly, it might be argued that public dental patients are more likely to be passive in their dental decisional control since most are socio-economically disadvantaged which makes them eligible to receive government supported dental services (Brennan *et al.*, 2008). However, the recent increase in health information access enabled by the internet (Hoffmann *et al.*, 2014), individualism and consumerism (Alden *et al.*, 2012) might have an effect on the DCP of public dental patients. It might be beneficial to understand dental decisional control preferences (DDCP) among a specific group of public dental services' users such as third molar (TM) patients and factors contributing to these preferences.

The benefits of involving TM patients in decision-making might include the improvement of decision quality and a reduction in decisional conflict. For example,

while the current Australian figures suggest that TM are removed prophylactically (Anjrini *et al.*, 2015), there is a lack of evidence to support the prophylactic removal of asymptomatic impacted TM (Ghaemini *et al.*, 2016; Mettes *et al.*, 2012). In addition, patients themselves might obtain inconsistent recommendations regarding TM extractions from the Internet (Hanna *et al.*, 2015) which might be a potential source of decisional conflict. It might be possible to eliminate decisional conflict when patients are involved in treatment decision-making (Friedlander *et al.*, 2015; Graskemper, 2016; Kremer *et al.*, 2007). Understanding the individual's characteristics contributing to DDCP might assist clinicians and patients achieving the desired DDCP.

When patients are involved in decision-making they are more likely to adhere to treatment recommendations, are more informed, are more satisfied with the decisions and are able to make high quality decisions (Shay and Lafata, 2015; Street *et al.*, 2009), which might improve health outcomes. Among health outcomes, quality of life (QoL) has become an important end-point for health services research (Bowling, 2003). However, few studies have explored the association between DDCP and QoL among public dental patients. Therefore, it might be useful to explore whether DDCP is associated with QoL.

The objectives of this study were to determine: (1) the prevalence of different DDCP among public TM patients and the associated individual characteristics and (2) the association between DDCP and QoL.

## Methods

### *Data source and ethical approvals*

Data used in this study were from the baseline survey of the "Engaging Patients in Decision-Making" trial. This trial received ethical approvals from the Low Risk Human Research Ethics Committee (HREC), The University of Adelaide (HS-2013-23) and was approved by the Royal Adelaide Hospital HREC (approval number: HREC/14/RAH/160). The trial was registered on the Australian and New Zealand Clinical Trial Register (ACTRN12614000593639) (Hanna *et al.*, 2014). This study was undertaken with the understanding and written consent of each participant and per the World Medical Association Declaration of Helsinki (version 2008) principles.

### *Participants and setting*

Participants were recruited from patients eligible to receive public dental services provided by the South Australia Dental Services (SADS) and were referred by their dentist for TM consultation. For inclusion, participants needed to be aged 18 years or over and have access to the Internet. Participants were recruited by the Department of Oral and Maxillofacial Surgery administrative officer at the Adelaide Dental Hospital (ADH) with an invitation package, which included a SADS approach letter, participants' information sheet, consent form, baseline survey, a reply-paid envelope and a flyer for a \$10 conditional gift voucher on participation.

### *Participants' socio-demographic characteristics*

Participants were asked to provide their socio-demographic information such as age, gender, educational attainment, income level, employment status, occupation, place of birth

(as a proxy for ethnicity), private health insurance (PHI) status, health cards held (eligibility category for receiving government supported dental services), and their contribution to their TM treatment's costs.

### *The Control Preferences scale (CPS)*

The CPS was developed by Degner *et al.* (1997) and validated for its transferability into dentistry (Chapple *et al.*, 2003). Our participants were asked "Please select only one theme that reflects your preferred role in making a dental treatment decision". Participants were provided with five themes that reflect their preferred role in making a treatment decision. The CPS themes and their scores were: "I make the final decision about which treatment I will receive" (score = 5), "I make the final selection after seriously considering my dentist's opinion" (score = 4), "My dentist and I share the responsibility for the decision about which treatment is the best for me" (score = 3), "My dentist makes the final decision about which treatment will be used but has seriously considered my opinion" (score = 2) and "I leave all decisions regarding my treatment to my dentist" (scores = 1). Three DDCP categories were created: passive (for scores 1 or 2), collaborative (score 3) or active (for score 4 or 5). Such a categorization has been used before (Chawla and Arora, 2013).

### *Measuring quality of life*

This study used a dual approach in measuring QoL using a generic health related QoL (HRQoL) measure combined with an organ specific oral health-related QoL (OHRQoL) measures in order to capture different QoL elements (Brennan and Spencer, 2004).

### *Health-related quality of life using the EuroQoL EQ-5D-5L*

The EQ-5D-5L has 5-items developed to measure HRQoL (The EuroQoL Group, 2005). Each item represents a single domain of mobility, self-care, pain, anxiety or daily activities. The reference period is "today". Each item uses a 5-point response scale ranging from 0 for "I have no problems" to 4 for "I have extreme problems". The total EQ-5D-5L score ranges from 0 to 20.

### *Oral health-related quality of life using the Oral Health Impact Profile-Short Form (OHIP-14)*

The OHIP-14 is a 14-item scale (Slade, 1997), a shorter version of OHIP-49, based on Locker's conceptual model for oral health and adapted from the World Health Organization framework for impairment (Slade and Spencer, 1994). Each of the seven domains is represented by two items (functional limitation, physical pain, psychological discomfort, physical disability, psychological disability, social disability and handicap). Items are scored on a 5-point scale ranging from 0 for "Never" to 4 for "very often". The total OHIP-14 scores range from 0 to 56. The reference period is "over the past 12 months".

### *The single-item global rating of oral health and general health*

The single-item global oral health measure was developed by Locker and Allen (2007) as a self-rating for oral health status. Participants were asked to "rate your oral health"

and their responses were scored on a 5-point scale ranging from 5 for “Excellent” to 1 for “Poor”. The self-rated general health measure uses the same scoring system for the single-item self-rated oral health.

### Data analysis

Data were analyzed using SPSS statistics for Windows V 23.0 (IBM Corp, 2015). To test associations between participants’ characteristics and DDCP, Chi-square ( $\chi^2$ ) associations were calculated. Furthermore, this association was explored in an adjusted analysis using multinomial logistic regression model for DDCP. Scales mean, SD, reliability were calculated and the convergent validity of these scales were tested. To test the association between DDCP and QoL among other covariates, a multivariable linear regression model for each of the selected QoL measures was conducted.

## Results

A total of 163 valid responses were included (5 participants were excluded due to lack of internet access and 2 were

excluded due to excess missing information). Most participants were female ( $n=120$ , 73.6%) and the largest age group comprised those aged 19–25 years ( $n=67$ , 42.4%). Most had a “secondary school or less” education ( $n=94$ , 58.5%), with “tertiary education” less prevalent ( $n=67$ , 41.6%). Nearly half of the participants were unemployed ( $n=76$ , 46.6%) and the majority earned “less than \$20,000” annually ( $n=110$ , 71%). Nearly half preferred an active DDCP ( $n=71$ , 44.1%) followed by a collaborative DDCP ( $n=60$ , 37.3%) while a few ( $n=30$ , 18.6%) preferred a passive DDCP (Table 1).

### Association between individual’s characteristics and DDCP

DDCP was significantly associated with both gender ( $\chi^2=6.01$ ,  $P=.05$ ) and educational attainment ( $\chi^2=6.99$ ,  $P=.03$ ) (Table 1). The multinomial logistic regression model for DDCP was performed with “Passive” DDCP as the reference category (Table 2). Women and people with a tertiary education were more likely to have an active DDCP ( $OR=2.73$ ,  $P=.04$  and  $OR=2.72$ ,  $P=.04$  respectively).

**Table 1.** Participants characteristics and associated decisional control preferences

	Participants Total $n=163$	Dental Decisional Control Preference									
		Passive		Collaborative		Active		$\chi^2$ association			
		$n$	%	$n$	%	$n$	%	%	$\chi^2$	$df$	Sig.
Age group											
18 years or less	23	14.6%	5	21.7%	9	39.1%	9	39.1%	2.63	6	0.85
19-25 years	67	42.4%	15	22.7%	22	33.3%	29	43.9%			
26-36 years	48	30.4%	6	12.8%	21	44.7%	20	42.6%			
36 years and over	20	12.7%	4	20.0%	7	35.0%	9	45.0%			
Gender											
Female	120	73.6%	17 <sub>a</sub>	14.4%	44 <sub>a,b</sub>	37.3%	57 <sub>b</sub>	48.3%	6.01	2	0.05*
Male	43	26.4%	13 <sub>a</sub>	30.2%	16 <sub>a,b</sub>	37.2%	14 <sub>b</sub>	32.6%			
Education											
Secondary school or less	94	58.4%	22 <sub>a</sub>	23.7%	38 <sub>a,b</sub>	40.9%	33 <sub>b</sub>	35.5%	6.99	2	0.03*
Tertiary education	67	41.6%	8 <sub>a</sub>	11.9%	22 <sub>a,b</sub>	32.8%	37 <sub>b</sub>	55.2%			
Employment status											
Unemployed	76	46.6%	16	21.6%	27	36.5%	31	41.9%	1.655	4	0.80
Student	50	30.7%	7	14.0%	18	36.0%	25	50.0%			
Employed	37	22.7%	7	18.9%	15	40.5%	15	40.5%			
Income level											
Less than \$20,000	110	71.0%	24	22.0%	39	35.8%	46	42.2%	1.59	2	0.45
\$20,000 or more	45	29.0%	6	13.3%	17	37.8%	22	48.9%			
Private health insurance											
No	145	89.5%	28	19.4%	53	36.8%	63	43.8%	0.60	2	0.74
Yes	17	10.5%	2	11.8%	7	41.2%	8	47.1%			
Who pay for your TMs treatment											
Patient pay all expenses	19	11.7%	3	15.8%	6	31.6%	10	52.6%	2.98	6	0.81
Patient pay some	28	17.2%	4	14.3%	12	42.9%	12	42.9%			
Patient pay none	34	20.9%	9	26.5%	13	38.2%	12	35.3%			
Not specified	82	50.3%	14	17.5%	29	36.3%	37	46.3%			
Place of birth											
Australia	145	89.5%	28	19.4%	50	34.7%	66	45.8%	3.78	2	0.15
Outside Australia	17	10.5%	2	11.8%	10	58.8%	5	29.4%			

Note: Values in the same row and subtable not sharing the same subscript are significantly different at  $p < .05$  in the two-sided test of equality for column proportions. Tests assume equal variances. Tests are adjusted for all pairwise comparisons within a row of each innermost subtable using the Bonferroni correction.

\* The Chi-square statistic is significant at the .05 level.

**Table 2.** Multinomial logistic regression model for dental decisional control preferences <sup>a</sup>

	B	Std. Er	Sig.	OR	95% CI for OR	
					Lower Bound	Upper Bound
Collaborative DCCP						
Intercept	-0.36	0.88	0.685			
Age (years)	0.01	0.03	0.623	1.02	0.96	1.08
Gender (female)	0.62	0.48	0.197	1.86	0.73	4.75
Tertiary education <sup>b</sup>	0.31	0.51	0.546	1.36	0.50	3.68
Income ≥ \$20,000 <sup>c</sup>	0.39	0.58	0.506	1.47	0.47	4.58
Active DCCP						
Intercept	-0.33	0.90	0.713			
Age (years)	0.00	0.03	0.915	1.00	0.94	1.06
Gender (female)	1.00	0.49	0.042	2.73	1.04	7.17
Tertiary education <sup>b</sup>	1.00	0.49	0.043	2.72	1.03	7.14
Income ≥ \$20,000 <sup>c</sup>	0.45	0.58	0.435	1.57	0.50	4.90

<sup>a</sup> Reference category = Passive.

<sup>b</sup> Reference category = Secondary school or less.

<sup>c</sup> Reference category = < \$20,000.

**Table 3.** Linear regression model for OHIP-14

	Unstandardized Coefficients		Standardized Coefficients	<i>p</i>
	B	Std. Error	Beta	
(Constant)	21.35	4.60		0.00
Age (years)	0.40	0.15	0.22	0.01
Gender (male)	-10.44	2.62	-0.32	0.00
Tertiary education <sup>a</sup>	-3.88	2.37	-0.13	0.10
\$20,000 or more <sup>b</sup>	-2.32	2.69	-0.07	0.39
Dental decisional control preference <sup>c</sup>				
Collaborative	-6.66	3.22	-0.22	0.04
Active	-6.40	3.20	-0.22	0.05

<sup>a</sup> Reference category = “secondary school or less”

<sup>b</sup> Reference category = “< \$20,000”

<sup>c</sup> Reference category = “Passive”

#### *Association between DDCP and OHIP-14*

The OHIP-14 mean score was 21.7 (*SD*=14.5). OHIP-14 scores correlated with the global self-rated oral health ( $r=-.33$ ,  $P<.01$ ). In a multivariable linear regression model for the OHIP-14 controlling for age, gender, educational attainment and income, having an active ( $B=-6.40$ ,  $P=.05$ ) or collaborative DDCP ( $B=-6.66$ ,  $P=.04$ ) were associated with better OHRQoL when compared with passive DDCP (Table 3).

#### *Association between DDCP and EQ-5D-5L scores*

The EQ-5D-5L mean score was 3.1 (*SD*=2.5) and were correlated with the global self-rated general health ( $r=-.34$ ,  $P<.01$ ). In a multivariable linear regression model for the EQ-5D-5L controlling for age, gender, educational attainment and income, DDCP was not associated with HRQoL (Table 4).

### **Discussion**

We found a wide preference among TM patients attending public dental services for involvement in making dental treatment choices. Active involvement was preferred by women and/or those with tertiary education and was associated with better OHRQoLs. While an observed association

between DDCP and HRQoL was not statistically significant, the positive direction of the association could be tested in further studies with greater statistical power or a different HRQoL measure that might capture more QoL domains to verify this potential relationship.

The high prevalence for more involvement in dental decision-making differed from the evidence suggested by medically-related studies in disadvantaged adults (Say *et al.*, 2006). This might be attributed to differences in the complexity of the condition as patients tend to prefer to be involved in treatment decision-making when the condition is not critical (Wilkinson *et al.*, 2008). Furthermore, medically-related studies indicated that frequent visiting is associated with greater preference for involvement (Alden *et al.*, 2012), a finding which might need to be considered for the DDCP. In addition, there is a greater tendency for patients to participate in decision-making (Chewning *et al.*, 2012) as advocated in Australian healthcare policies (Lucia, 2016). The prevalence of high involvement preference might also be attributed to decreased power distance enabled by more lay access to information (Oetzel and Ting-Toomey, 2013).

Women's greater preference for involvement in decision-making is consistent with a review that included medical studies (Say *et al.*, 2006). Alden *et al.*

**Table 4.** Linear regression model for EQ-5D-5L

	Unstandardized Coefficients		Standardized Coefficients	<i>p</i>
	B	Std. Error	Beta	
(Constant)	2.67	0.79		0.00
Age (years)	.06	0.02	0.20	0.01
Gender (male)	-1.35	0.46	-0.24	0.00
Tertiary education <sup>a</sup>	-.47	0.42	-0.09	0.26
\$20,000 or more <sup>b</sup>	.05	0.13	0.03	0.72
Dental decisional control preference <sup>c</sup>				
Collaborative	-.77	0.57	-0.15	0.18
Active	-.99	0.57	-0.19	0.08

<sup>a</sup> Reference category = “secondary school or less”

<sup>b</sup> Reference category = “< \$20,000”

<sup>c</sup> Reference category = “Passive”

(2012) believed that females have more life experience which might explain this phenomenon. The association between educational attainment and active DDCP is understandable considering that clinical decision-making is an interactive communication process, where literacy is known to be important. Although evidence from medical studies suggests that being on a low-income, in general, is associated with preferring a passive decisional control (Say *et al.*, 2006), findings from the adjusted analysis excluded this association.

Preference for involvement in dental treatment decision-making was positively associated with OHRQoL. It has been argued that when patients are involved in clinical decision-making, it improves the quality of the decision (Street *et al.*, 2009), and in turn health outcomes. These findings provide some evidence to support the possible benefit of involving patients in dental treatment decision-making to improve their OHRQoL. Patients’ involvement in decision-making was not associated with HRQoL, which might be due to the limited domains in EQ-5D-5L (Hanna *et al.*, 2017). Variations in the domains present in QoL instruments affect the apparent relationships between different QoL measures with the same oral health status (Brennan, 2013; Hanna *et al.*, 2017). Furthermore, the reference period of “today” for the EQ-5D-5L versus a longer reference period of “over the past 12 months” for the OHIP-14 might underestimate the impact of a specific condition on HRQoL (Durham *et al.*, 2015).

This study has some limitations related to the sample size due to the low response rate associated with mail recruitment for studies targeting young adults. However, the sample size is larger than that reported in a similar medically-related study (Wilkinson *et al.*, 2008). In addition, the study was not able to make inferences about the causal association between DDCPs and QoL. However, the way in which the CPS was worded suggests that our participants adopted the selected role in their previous dental treatment decision-making. The generalizability of our findings is limited by the specified sampling frame. On the other hand, this study has several strengths. It contributes to the field of dental decision-making by revealing a positive association between active DDCP and QoL and identified individual characteristics associated with DDCP. This is important for enhancing clinical practice; by not only changing beliefs about the perceived preference of public dental patients for a passive decisional control,

but also improving clinicians’ sensitivity to their patients’ desired DDCP. The clinician’s ability to encourage their patients to take the desired DDCP might improve their patients’ QoL.

## Conclusion

In contrast with what was traditionally believed for public dental patients preferring a passive role in decision-making, most participants in this study preferred to be involved in making their dental treatment choices. Being a female and/or having a tertiary education was associated with a greater preference for active decisional control. The best way to find out a patient’s preferred DDCP is for clinicians to ask their patients. However, understanding the patients’ characteristics associated with DDCP might enable clinicians to be more sensitive to their patients’ preference. Participants who preferred to be involved (either actively or collaboratively) had better OHRQoL. Although this positive association was maintained in regards to HRQoL, it was not found to be statistically significant. This might suggest the need for future studies with greater statistical power or using a different HRQoL instrument. These data provide some support for the need for clinicians to enhance their patients’ involvement in decision-making to improve their quality of life.

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## Declaration of Conflicting Interests

The Authors declare that there is no conflict of interest.

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