



## **Migrant construction workers' demography and job satisfaction: A New Zealand study**

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## Migrant construction workers' demography and job satisfaction: A New Zealand study

### Abstract

**Purpose:** The demand for construction-related occupations has increased consistently over many years in New Zealand (NZ). This has necessitated recourse to migrant workers to address capacity and capability requirements. Migrant construction workers hail from various backgrounds with a complex set of their needs being met through employment in NZ. Research on understanding the satisfaction levels of this category of construction workers is scarce. With recent insinuations about migrant exploitations, research investigations into this knowledge area is significant. In this study we sought to establish the moderating effect of migrants' demography on the determinants of job satisfaction in NZ's construction sector.

**Research design:** Data was obtained from migrant construction workers of Chinese extraction through a structured questionnaire survey. From 200 questionnaires administered, 108 samples were completed by migrant construction workers involved in major projects in Auckland city, NZ. Data obtained were analysed using descriptive and inferential statistics to establish the moderating effects of their demography on job satisfaction..

**Findings:** Results from this study support the internal validity and reliability of these personal characteristics as moderators of job satisfaction for migrant construction workers. These results suggest the relevance of personal characteristics of Chinese migrants in any improvement initiatives being developed for this group of construction workers.

**Research limitations/implications:** The findings from this study contribute to the discourse on the relevance of construction migrants as a strategic alternative to addressing skill shortages within the NZ construction sector. They also provide evidence that contributes to an improved understanding of the migrant workforce to meet their aspirations and enhance their general well-being.

**Originality/value:** Although the study is ethnic-specific, the conclusions show the relevance of personal characteristics in the experiences of construction migrant workers. The study is representative of the catchment of temporary migrant workers in the construction industry in NZ. The study provides insights for organisations employing migrants about putting in place appropriate measures to enhance their satisfaction levels. Finally, this study's findings may contribute to policy initiatives on the optimal categories of migrants engaged on construction activities to derive the maximum benefits for NZ.

**Keywords:** Construction workers; Demography, Migrant workers; Job satisfaction



## Introduction

New Zealand's construction industry [NZCI] has witnessed considerable year-on-year growth since 2011. Annual growth within the industry averaged 6.60% between 2011 and 2015, slowing gently thereafter until 2019 when the COVID-19 pandemic hit (Granwal, 2020). Regardless, the NZCI's economic importance remains significant. According to recent report by NZ's Ministry of Business, Innovation and Employment (MBIE) (2020), NZCI's Gross Domestic Product (GDP) contribution in 2020 was NZ\$16.2 billion – the equivalent of about 8% of the national GDP. Another report by Stat NZ (2020) suggests NZCI is fourth amongst the top 10 industries that contribute to NZ's GDP's national production measure and the fifth-largest sector in terms of employment. When combined with other sectors that provide services related to construction, NZCI accounts for just under 200,000 people, which translates to about 10% of total national employment.

Various NZCI growth triggers have been reported. According to Bretherton (2017), there were increased construction activities after the 2010 and 2011 Christchurch earthquakes due to the city's rebuild programme. Most of the construction works in NZ's major cities have been due to population growth and economic activities, resulting in a more considerable demand for different infrastructural facilities such as housing, commercial building, transportation, communication, energy, and industrial projects. The phenomenal increase in economic activities across all NZCI subsectors heightened resource shortfalls amongst construction organisations. The MBIE (2017) report projects the demand for construction-related occupations to rise by about 11% between 2016 and 2022, suggesting over 57,000 additional skilled workers will be required by 2022 to cope with the growth in demand. This skill requirement is challenging because the industry is already in a state of acute skill shortage. A BDO (2020) NZ report had indicated concerns around the availability and quality of construction occupations. It had concluded from their investigations that the balance between quality and quantity of workers in the construction sector was precarious. Shortages of skilled workers in construction industries are therefore prevalent. Jackson (2018) articulates the difficulties faced by industry associations in the United States' construction sector. For instance, 78% of Associated General Contractors of America members had trouble finding qualified workers, while 82% of construction firms said they expected the unavailability of skilled labour to remain a difficult challenge or to worsen. Another report by AECOM, a global premier infrastructure firm, showed skills and materials shortages were the highest ranked (at 43%) of the industry's most critical challenges (AECOM, 2019).

Many studies have acknowledged resource shortages as a common challenge in the construction industry globally, due to a wide range of factors (Dainty et al., 2005; Dhal, 2020; Ho, 2016; Juricic et al., 2021; Lobo and Wilkinson, 2008; McGrath-Champet al., 2011). As a result, attracting skilled migrant workers has become a policy thrust in many developed economies (Guo and Al Ariss, 2015; Přivara et al., 2020). Migrant workers are of considerable economic significance to the NZCI (MacLennan, 2018). Harkins (2016) explains how such migrant workers contribute to the economies of their host countries. Harkins also offers some insight about the need to understand the challenges faced by these workers, so appropriate measures can be put in place to ensure and enhance their well-being and economic outcomes, wherever they are resident. There is evidence of exploitation of construction migrant workers in NZ, some of which have necessitated recent changes to immigration policies (MBIE, 2021).

Seale et al (2015) had reported that the vulnerability of temporary migrant workers in the construction industry had become an emerging issue. The rebuild programme exacerbated exploitation after the 2012 Canterbury earthquake with noticeable pay differences between migrants and locals, and unhealthy living conditions (MacLennan, 2018). More recently, Kilgallon and Xia (2021) confirmed that Chinese migrants are overworked and underpaid. There is also a propensity for lower job security for migrant construction workers according to Buckley et al (2016). MacLennan's (2018) seminal work on Filipino construction workers is hereby acknowledged; however, little is known of Chinese migrant worker situations in NZ. In 2017, 9% of temporary work visa holders came from China (MBIE, 2017). We submit that migrant construction workforce remain largely understudied in NZ's social science research.

Such a knowledge gap is consequential. In an industry where job satisfaction remains an ongoing issue (Macky and Boxall, 2008), it is important to understand how migrant workers moderate this. For greater clarity, van der Westhuizen et al. (2012), Pacheco et al. (2016), and Kwok et al. (2015) have explained the role of culture in determining job satisfaction. Thus, it is essential to establish whether the same determinants of (dis)satisfaction speak to migrants and indigenous workers the same way; and, if at all, whether there are demographic nuances to outturn effects of the determinants of (dis)satisfaction on migrants or indigenous workers in the NZCI. This current study seeks to identify the determinants of job (dis)satisfaction for migrant construction workers using a representative sample of Chinese ethnic groups who hold temporary visas and work in the NZCI.

### **Determinants of Job Satisfaction and Demographic Measures**

It is critical to consider the nuances arising from the ways migrants and the indigenous workforce view job satisfaction. However, normative literature seldom considers this definitively; and, where it does, comparisons between migrant and indigenous workforce satisfaction are mainly inconclusive, especially around the demographics and ecosystems of work (see Wahi et al., 2020, on the future of work and the modern workplace as an ecosystem).

Understanding such nuances does not render extant applied psychology theories less valid. Instead, it is crucial to know whether these would help future studies better understand job satisfaction and the specific implications of situating migrants and indigenous workforces within the broader industry. Wang and Jing (2018) provide insights into work- or non-work-related factors that could influence immigrants' job satisfaction, either independently or in combination. Within their postulations of non-work-related factors are three main categorisations: general demographic factors, culture-related factors and community-related factors. The current study considers the moderating influence of general demographic factors on job satisfaction. We focus on Chinese immigrant workers within the NZCI as the host community; these are intended to act as proxies for culture and community-related factors. The following subheadings provide brief outlines of the demographic measures used in the current study.

## **General demographic measures**

Previous studies provide empirical justification of the variability in job satisfaction levels between immigrants from different backgrounds. Magee and Umamaheswar (2011) and Ko et al. (2015) contend that immigrants' backgrounds are significant in job satisfaction studies because of the tendency of migrants to choose different reference systems to evaluate job conditions in their host country. Furthermore, variable responses to job experiences can be explained by migrants' needs, prior experiences and work orientation that are likely to be specific to their countries of origin. We expand on these general demographic factors in the following paragraphs.

### **Understanding measures of demography**

#### **Gender**

Bussey (2011) explains the underlying importance of gender as a means of self-definition in most societies. Bussey's story draws a line of distinction between sex and gender: sex as a biological denominator; gender as the way people want to be identified. Nonetheless, beyond identification, societal complexities around gender identification and discrimination have been well documented. For example, Gartzia and Lopez-Zafra (2016) explained such complexities include equality issues in the sense of inclusion, wage discrimination, equal opportunities and cultural segregation, and marriage and education biases. There is also a political side: many countries have different cultural orientations, public perceptions and reforms regarding gender identities and rights. For example, some countries still struggle with accepting same-sex marriage and transgender outlooks – these can attract severe penalties in such parts of the world. Thus, gender as an issue is a reasonable cause for migration. People tend to move to locations where they achieve safety, inclusion, acceptance, fulfillment, personal values, freedom and career opportunities. They tend to avoid places where societal complexities around their gender could burden them.

#### **Age**

Age is a widespread basis for differentiation across the strata of social structure (Linton, 1936). It defines inclusion and exclusion regarding work and entitlements, critical life decisions regarding work and family, and the attraction of migrating to seek improved work satisfaction or leisure. A study by Ajayi and Olatunji (2017) found that some employees are more inclined to voluntary turnover for mobility within certain age brackets. Gazioglu and Tansel (2006) found a U-shaped relationship between worker age and job satisfaction – aspirations to remain in a job are highest amongst young and old workers. While it is logical that young people are often inclined to explore opportunities and seek freedom through mobility, middle-aged workers are often attracted to stability and have commitments beyond work to stay in a job. These perceptions shape the decision to migrate, as well as job satisfaction and turnover.

#### **Educational background**

Education can be considered a key source of self-improvement and could be a prerequisite for growth and advancement in career and professional goals. Education can enhance esteem, confidence, skills and



competencies, career success, self-efficacy and future career expectations (Baruch and Peiperl, 2000). Several studies have associated levels of education with job satisfaction. González, Sánchez and López-Guzmán (2016) believe that an employee's education level is an important variable that is strictly personal in nature, and that the higher the level of education, the more employment options are available. Nikolaou, Theodossiou and Vasileiou (2005) argue that job satisfaction levels increase with education levels because workers can gain the correct employment positions to help them live a great life. Other authors have argued that higher job satisfaction comes from higher income (Bakan and Buyukbese 2013), better employment benefits (Pandey and Asthana 2017) and career advancement opportunities (Mehdiabadi and Li, 2016; Ling et al., 2018) that higher educational backgrounds provide.

However, in contrast, Clark and Oswald (1996) contend the higher the level of educational attainment, the lower the satisfaction level reported by job holders. A more recent study in Spain found that educational levels do not influence job satisfaction (Gonzalez, Sanchez and Lopez-Gunzman (2016). The argument is that higher educational levels impact negatively on overall satisfaction in certain jobs (Clark and Oswald, 1996; Gazioglu and Tansel, 2002; Grund and Slivka, 2001; Sloane and Williams, 1996). According to González et al. (2016) and Lam, Zhang and Baum (2001), education may raise employees' expectations, depending on their personal and professional aspirations. Such employees could also become more discerning regarding improper work contexts that could impact their mental and physical health (Gürbüz, 2007).

For the current study, we align with the reflection theory explained in Froese, Peltokorpi, Varma and Hitotsuyanagi-Hansel (2019) that more educated migrants are more likely to exhibit greater job satisfaction. Especially when they perceive that their work performance counts towards their achievements within their host country.

### **Marital status**

Marital status can be significant in determining the level of satisfaction of migrant workers. Depending on immigration status, they are either able to travel alone or not. Knipe et al. (2019) explain that most Asian migrant workers have temporary visas and emigrate without their families. Compared to unmarried men and women, married migrant workers face additional issues, chiefly due to marital separation and an inability to fulfill some parental responsibilities. The moderating effect of marital status is studied in global literature with respect to the well-being of migrant workers and those who are left behind (Knipe et al., 2019; Lei et al., 2020; Shattuck et al., 2019; Tong et al., 2019). Tong et al. (2019) found the psychological consequences of family separation are largely underexplored in Chinese migrant workers. These authors found that depressive symptoms are more prevalent in married adults who emigrated from rural areas of China.

Furthermore, because of additional household commitments and a reduced level of intimacy, spouses left behind in China may also experience elevated stress levels. Stress may eventually have a consequential effect on the psychological well-being of the migrant worker and, thus, their job satisfaction. In contrast, migrant workers may have enhanced job satisfaction because of their ability to provide a better economic environment for their dependents (Hadi, 1999; Shattuck et al., 2019). Another possibility is that Chinese migrant workers may move to

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New Zealand with their families. Global literature shows they may face additional work-life balance issues because of competing priorities such as caregiving and breadwinning (Khanh et al., 2020). Eventually, their overall job satisfaction may be impaired. Mohsin et al. (2019) explain that the prevalence of these issues is different from one context to another depending on host governments' commitments to international protocols and local legislation that could focus on migrant workers' goal achievements and well-being. Therefore, in the current study, marital status is considered a demographic variable that could influence overall job satisfaction, either in isolation or in combination with other personal characteristics.

### **Years of experience**

The last measure relating to general demography is the length of migrant workers experience. We have taken the premise that workers could perceive their job satisfaction differently based on their experience levels. Prior work experiences may mean migrant workers have more reference points with which to compare their work situations. For example, Badawy (1994) has shown that work experiences, coupled with career expectations, relate to satisfaction because of perceived confidence and competence in doing work. In another regard, Okpara (2004) argues that the more work experience, the more respect workers have for their jobs, which could translate to greater job satisfaction. Latiff et al. (2017) contended that this was the case for teachers' job satisfaction levels, increasing with their service length.

Furthermore, Bilgic (1998) concludes that work experience contributes positively to feeling good about one's job. Although, feeling good may be impaired by discrimination, especially discrimination against migrants' characteristics such as their experience level. A perception of inferior work experiences (however useful these may be) may cause reduced psychological well-being and, consequently, lower job satisfaction (Wang and Jing, 2018). Townsend et al. (2014) report on this lack of trust in prior abilities for immigrants, which we consider significant to their level of job satisfaction.

### **General measures of job satisfaction**

Many studies have examined numerous attributes of job satisfaction amongst workers. Normative knowledge about job satisfaction has matured over several decades. For example, a survey of public employees by Brayfield, Wells and Strate (1957) found employees who are not satisfied with their jobs often lack a general sense of satisfaction in other areas of their lives. The same argument is relevant today: if migrant workers are to have some pleasant experiences in their mobility, it is important that they are pleased with their work as with their lives generally. What these mean to workers in different industries and across nuanced demographics have been measured by various authors. Tian, Wang and Chia (2018) found migrant skilled workers in Australia are keener on skill utilization than just having a job. However, migrants' opportunities to migrate and integrate themselves in their new nation depend on two crucial factors: whether they are satisfied with their host nation and communities, and whether there are considerable policies in such a host nation and communities that facilitate what migrant workers might consider attractive in terms of labour relation and social security. According to a finding by Randeree (2008), skilled migrants

are often not attracted to societies that are notorious for labour injustice or are not known for social investments that are hospitable to migrant workers.

Other studies have further investigated workers' general satisfaction into specific elements. Evidence suggests workers would prefer to be paid well, on time and that they receive benefits and entitlements that do not discriminate them negatively (Card et al. 2012; Steinmetz, de Vries and Tijdens 2014). In addition, voluntary turnover risks have reduced where workers received paid leave, medical insurance and can afford their health costs, and where they receive considerable housing benefits (Lee, Hsu and Lien 2006; Ajayi and Olatunji 2017).

In addition, Jaskyte et al. (2020) also suggests that the work environment is critical to employees' job satisfaction. For migrant workers, they need to know whether their host communities value them; in that, they can put their skills to use, they can integrate in the society, they understand their work requirements and that their work provides them considerable opportunities for advancement. Such advancement would mean that workers are able to improve their knowledge and skills, as well as their career (Oyewobi, Suleiman and Muhammad-Jamil 2012; Tsai 2008). Felstead et al. (2015) view is that an organisation that allows their employees to advance their knowledge and career opportunities often benefits from workers' goodwill as workers generate self-led enablement through creativity, continuous renewal through active learning, and are able to develop their special abilities. Zou and Sunindijo (2013) found that the quality of employees' knowledge will determine their self-awareness and commitment to safe work practices and the regulatory codes and standards in relation to their duties.

Ajayi and Olatunji (2017) have examined the role of leadership quality in workers' voluntary turnover. They found employees connect to their jobs through their leaders, supervisors and work colleagues. A notable finding in their study is that leaders and direct supervisors must be capable of providing clear instruction to the employees under them, and such employees must see them as trustworthy and a go-to person, including for personal and confidential conversations. Li et al. (2018) add loneliness to this: migrant workers are often vulnerable to a high level of loneliness. This could draw away from their level of affective commitment and their engagement and participation. This can only worsen when they lack companionship at work, or feel isolated or unwanted.

### The Study Variables

It is evident from the literature reviewed that migrants' work satisfaction within the NZCI is under-reported. Specifically, it is unclear how personal characteristics shape job satisfaction amongst these Chinese migrant workers, and how job satisfaction amongst the migrant workers shapes overall well-being. It is important to provide clarity on the relationship between demographic variables of migrant workers, their perceptions of job satisfaction and the ideals of job satisfaction amongst the general NZCI workforce. This study assumes that work attitude is shaped by multidimensional contexts, such as individual attributes, and job and organisational characteristics.

**Error! Reference source not found.** illustrates the codes of the dependent and independent variables used in the study. Overall satisfaction was the dependent variable; OS1—OS3 were the statements of measure. A 5 point Likert scale was used to obtain responses from participants through a questionnaire survey. On this scale, '1'



represents 'strongly disagree' whilst '5' represents 'strongly agree'. Mid-scale, '3' represents 'neutral'. At the end of the literature review, 23 factors (f) were selected as determinants of overall satisfaction. They were arranged under five sub-categories: remunerations (RN) (f=7); work environment (WE) (f=3); knowledge advancement and career progression (KACP) (f=5); quality of leadership and work colleagues (QLWC) (f=5); and loneliness (LON) (f=3). As with the dependent variables, similar 5 point Likert scale was used. It is expected these factors are positively correlated with general satisfaction, except LON1 and LON2 which may negatively influence general satisfaction.

**Table 1: Definition of variables**

Code	Variables		
	<b>Dependent variable</b>		
<b>OS</b>	<b>Overall satisfaction</b>		
OS1	I am generally satisfied with my work in New Zealand		
OS2	I will recommend this country as a good place to work		
OS3	I would like to continue working in New Zealand if I was given the opportunity		
	<b>Independent variables</b>		
<b>RN</b>	<b>Remunerations</b>	<b>QLWC</b> <b>Quality of leadership and work colleagues</b>	
RN1	I am generally satisfied with my income level	QLWC1	My supervisor keeps me informed of the things I need to do to perform well in my job
RN2	I always get paid on time	QLWC2	My supervisor is fair and does not show favouritism
RN3	I can get paid leave	QLWC3	I feel comfortable bringing up my personal issues with my supervisor and co-workers
RN4	My employer offers medical insurance	QLWC4	My supervisor is understanding when I talk about personal and family issues that affect my work
RN5	I can afford my local health care	QLWC5	I have support from supervisor and co-workers that help me to manage my job and personal or family life
RN6	My employer offers accommodation		
RN7	My employer offers other benefits for employees		
<b>WE</b>	<b>Work environment</b>		
WE1	I can adapt to the work environment of NZ		
WE2	It's easy for me to understand the way work is done in NZ	<b>LON</b> <b>Loneliness</b>	
WE3	I feel valued and recognised by my employer	LON1	I feel a lack of companionship at my place of work
		LON2	My interest and ideas are not shared by those around me
		LON3	There are people I can turn to for help or support
<b>KACP</b>	<b>Knowledge advancement and career progression</b>		
KACP1	My job requires that I keep learning new things		
KACP2	My job requires that I be creative		
KACP3	I have the opportunity to develop my own special abilities		
KACP4	I understand the roles of health and safety in NZ		
KACP5	I understand the standards and codes of NZ related to my duties		

Migrant construction workers who are Chinese citizens were selected for this study (see Introduction) because they remain understudied in NZ. This study sets the following hypotheses to evaluate the status and dependents of overall job satisfaction of the Chinese construction workers in New Zealand.

H1: Chinese construction workers are satisfied with their jobs overall.

H2: The demographic status of migrant Chinese construction workers moderates their job satisfaction.

H3: The demographic status of migrant Chinese construction workers moderates the determinants of overall job satisfaction.

Figure 1 shows the conceptual model of the current research. The relationships among the overall job satisfaction and the independent variables (i.e. RN, WE, KACP, QLWC and LON) will be established only under future study; the scope of the current study is limited to evaluate the moderate effect of the demographics towards the dependent (H2) and independent (H3) variables. What are the practical implications of the outcomes of H2 and H3?

Testing H2 will assist to understand the variations of overall job satisfaction across the NZ Chinese construction worker's population. More importantly, the outcomes will determine the pre-requisites of the regression analysis required in future to determine the holistic effect from the independent variables and demographics towards overall job satisfaction. If any of the demographical variables significantly influences workers' job satisfaction, those categorial variables will require specific methods of transformation before regression compared to continuous variables (see the discussion). Some researchers may be interested in improving particular areas (for example: work environment or loneliness) or variables of the independent category regardless of their effect towards employee's overall job satisfaction. For example, being valued or recognised (i.e. WE3) may or may not influence Chinese construction worker's job satisfaction significantly. Nevertheless, human right activists and unions may be interested in them. Therefore, the outcomes of H3 will be important in understanding the variations in perceptions of the independent variables across the population.

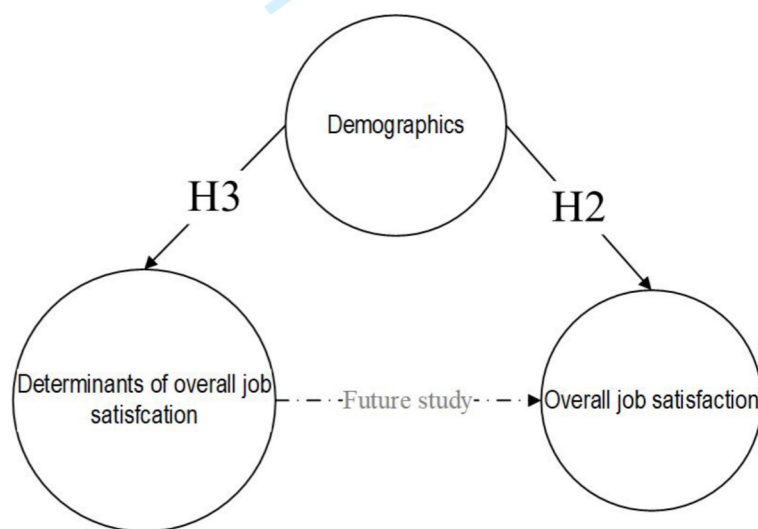


Figure 1: Conceptual framework of the study: the effect of demographics on overall job satisfaction and the determinants

## Research Method

This study uses explanatory research design to explain causal relationships between the different variables through hypothesis testing. Participants of the study are Chinese migrant construction workers plying their trades in Auckland. They hold Temporary Work Visas [TWVs] that last only for the duration of a project. Chinese construction workers were selected for the current study because little is known of their working conditions, perceptions of their work environments and the level of their goal achievements, yet they are significant in number, they work on large projects, and are well-entrenched as a substantial component of the diversified local workplace. The actual number of migrant Chinese construction workers on temporary work visa is currently unavailable. However, in 2019 there

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3 were 22,192 Chinese migrants that arrived on temporary work visa to New Zealand (Kilgallon and Xia, 2021).  
4 Auckland was chosen as the study area because it is the biggest city with more construction activities. A sample  
5 of 200 workers was taken by purposive sampling, and questionnaires were administered to migrant construction  
6 workers employed on five major projects. The participants were selected on the basis of a degree of homogeneity  
7 of their visa status. This is to ensure that the data collected was reliable and adequate (Alreck and Settle, 1995).  
8 Survey participants were accurately targeted using purposive sampling. This sampling approach permitted the  
9 selection of participants that represent a broad group of cases as closely as possible on a dimension of interest  
10 (Teddlie and Yu (2007). 108 questionnaires were completed among this group, representing a response rate of  
11 54% of the target population. All participants were aged above 18 years, with 92% of them aged between 25 and  
12 54 years old. Most respondents – 91% – were males.

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Description	Respondents	
	Number	Percentage
<b>Gender</b>		
Male	98	90.74%
Female	9	8.33%
Prefer not to answer	1	0.93%
<b>Age</b>		
18–24 years old	7	6.48%
25–34 years old	23	21.30%
35–44 years old	40	37.04%
45–54 years old	36	33.33%
55+ years old	2	1.85%
<b>Ethnicity</b>		
Chinese	107	99.07%
Southeast Asian	1	0.93%
<b>Educational background</b>		
Under high school	49	45.37%
High school	26	24.07%
Bachelor's degree	17	15.74%
Postgraduate qualification (Grad. Certificate, Grad. Diploma or Master)	12	11.11%
Trade school	2	1.85%
None	2	1.85%
<b>Marital status</b>		
Yes	90	83.33%
No	10	9.26%
In a relationship	2	1.85%
Prefer not to say	6	5.56%
<b>Year of work experience</b>		
0–5 years	27	25.00%
5–10 years	8	7.41%
10–15 years	23	21.30%
15–20 years	19	17.59%
20–25 years	10	9.26%
25+ years	21	19.44%
<b>How long have you been in NZ?</b>		
0–6 months	32	29.63%
7–12 months	28	25.93%
13–18 months	7	6.48%
19–24 months	12	11.11%
24+ months	29	26.85%
<b>How long do you plan to stay in NZ?</b>		
1–3 years	39	36.11%
4–6 years	18	16.67%
7–9 years	10	9.26%
10+ years	41	37.96%

The questionnaire for this study was developed based on the review of relevant literature on the measures of job satisfaction. A questionnaire survey was employed over other methods of data collection because it captures the perception of the construction migrant workforce regarding the significance of the identified variables as measures of job satisfaction. The questionnaire was physically distributed to the research participants on construction sites. This way it was possible to reach a representative group of migrant workers in a short time. The questionnaire had four sections and required about 15 minutes to complete. It was developed in English before being translated to Chinese (Mandarin). Participation was voluntary, and participants could choose between the English and Chinese versions of the questionnaire. Almost all the participants chose the Chinese version – this could be attributed to the fact that English is not an official language in China. A full breakdown of the demography of the participants is presented in Table 2. The Table reports data on participants' gender, age, nationality, educational qualification, marital status, work experience, and planned and actual length of stay in NZ.

## Data analyses

Before data analysis, internal consistency was checked for each sub-group shown in **Error! Reference source not found.** using Cronbach's Alpha Reliability test. Findings suggested data were consistent internally (Cronbach's Alpha > 0.7). In addition, outliers were checked by observing histograms and box-plots. Using SPSS 26, a Little's Missing Completely at Random (MCAR) test was conducted at  $\alpha=0.05$ . Findings showed data were missing randomly, hence there was no requirement to impute missing data.

To test normality, a series of Shapiro-Wilk (SW) tests was conducted after removing the outliers. The level of significance was less than 0.05 ( $p<0.05$ ) for all the variables. Thus, the data distributions were not 'precisely' normal. Since the non-parametric alternatives have limitations and accuracy issues, parametric tests could be still used and recommended if the data distributions are 'approximately' normal; (Cantor and Shuster 1992; Razali and Wah 2011; Smith 2012; Kwak and Kim 2017; Matulová and Rejentová 2021). To check the validity of approximate normality, numerical and graphical tests were conducted as there is no formal test to assist this (Smith 2012): after checking the Q-Q plots for all the distributions, there was no significant deviation between the snake like data distributions and straight lines. Thus, approximate normality could be assumed, but the interpretation of graphical tests can be overly subjective. Because of this, kurtosis and skewness were checked as additional means to substantiate this conclusion. The findings showed that both kurtosis and skewness were between  $\pm 1$  for the data distributions. Consequently, the data distributions were considered as approximate normal (Razali and Wah 2011): means and standard deviation were selected over non-parametric measures to explain the data.

One-sample t-tests were used to interpret population means. For all inferential statistical tests, the threshold was set as  $p\leq 0.05$ . To check group-wise variations in the population means, independent samples' t-test and one-way ANOVA were conducted. Table 2 shows the demographic information of migrant construction workers from whom data were collected.

## Results

### Overall job satisfaction

As per H1, Table 3 illustrates the sample statistics and population tendencies derived for the measures of overall job satisfaction. The sample means show participants were somewhere between 'somewhat agree' and 'strongly agree' towards OS1-3. The agreement was most positive towards OS3 ( $\mu_s=4.38$ ), followed by OS1 ( $\mu_s=4.22$ ) and OS2 ( $\mu_s=4.15$ ) respectively.

**Table 3: Sample statistics and population tendencies – overall satisfaction**

Statistics	N	Sample statistics			Population tendencies				Correlation: r (p value)	
		Mean	Median	Mode	Std. deviation	$\mu_0$	t	df	Sig. (2-tailed)	
OS1	102	4.22	4	4	0.840	4.2	0.189	101	0.851	-
OS2										-
OS3										



OS2	97	4.15	4	4	0.939	4.2	-0.476	96	0.635	0.763 (p=0.000)	-
OS3	104	4.38	5	5	0.816	4.5	-1.442	103	0.152	0.588 (p=0.000)	0.743 (p=0.000)

To find participants' agreement towards overall job satisfaction, one-sample t-tests were conducted. For the population mean ( $\mu$ ), the null ( $H_0$ ) and alternative ( $H_a$ ) hypotheses were set as below:

$H_0: \mu = \mu_0$  (the population mean is equal to the hypothesised population mean)

$H_a: \mu \neq \mu_0$  (the population mean is not equal to the hypothesised population mean)

By observing the sample mean and standard deviation values, a trial-and-error procedure was employed to set the hypothesised population means for each dependent variable until one-sample t-test statistics indicated that the population mean was not significantly different to the hypothesised population mean. Only the accepted  $\mu_0$  values are shown in Table 3. The one-sample t-test statistics ( $p > 0.05$ ) showed that  $\mu$  was not significantly different from  $\mu_0 = 4.2$  for OS1 and OS2 and  $\mu_0 = 4.5$  for OS3. Table 3 Therefore, the Chinese construction population has a preference between 'somewhat agree' and 'strongly agree' towards the continuation of their work in NZ (i.e. OS3;  $\mu = 4.5$ ). Their general satisfaction (OS1) and the perception of NZ as a good place to work (OS2) are slightly greater than 'somewhat agree' ( $\mu = 4.2$ ). According to a paired-sample t-test, Chinese construction workers are more favourable towards OS3, compared to OS1 [ $t = 2.259$ ,  $df = 98$ ,  $p = 0.026$ ] and OS2 [ $t = 3.742$ ;  $df = 93$ ;  $p = 0.000$ ]. In addition, Table 3 shows the three variables are significantly correlated at  $\alpha = 0.05$ . A strong positive correlation exists between OS1 and OS2 ( $r = 0.763$ ;  $p = 0.000$ ), between OS2 and OS3 ( $r = 0.743$ ;  $p = 0.000$ ), and between OS1 and OS3 ( $r = 0.588$ ;  $p = 0.000$ ).

### Moderating effect of demographics towards general job satisfaction

As per H2, this study analysed the effects of migrant workers demographics towards overall job satisfaction. The following were set as  $H_0$  and  $H_a$  to facilitate the analysis:

$H_0$ : the population means are equal across the groups.

$H_a$ : the population means are not equal across the groups

Table 4 shows the summary of the analysis, including the demographic variables considered. Under gender, only males and females were considered; because these two groups account for 99.1% of participants, and the third category of participants who prefer not to state their gender did not meet the minimum required sample size for comparison [ $n = 1$ ]. The proportion between male and female was approximately 11:1. Although there is no data with respect to Chinese construction workers living in New Zealand, generally, women account for less than 10% in construction management positions while this percentage could be as low as 3-4% in the construction workforce (Naismith et. al., 2017; Hegarty 2020). Therefore, the sample distribution could be considered as a general representation of gender in the construction industry. Nevertheless, the low sample size in female may reduce the



accuracy of the independent sample t-tests because of compromising the central limit theory (Kwak and Kim 2017). Therefore, as a secondary measure, the non-parametric alternative (i.e., independent sample median test) was also performed to compare the median across the two gender groups. Another issue was the possibility to violate homogeneity of variance: however, the independent sample t-test provided statistics to test this assumption before conclusions were derived.

Similarly, only married and unmarried participants were considered under marital status. To test the null hypothesis, an independent-sample t-test was used. Other demographical variables such as length of time spent in NZ, age and educational background had more than two categories; therefore, one-way ANOVA was used for them. For the three dependent sub-variables (i.e. OS1-3),  $p$ -values were greater than 0.05 for gender, marital status and length of time stayed in NZ. For gender, the independent sample median tests showed the median of OS1 ( $p=0.991$ ), OS2 ( $p=0.698$ ) and OS3 ( $p=0.478$ ) are the same for male and female. Therefore,  $H_0$  was accepted. This means both male and female participants had the same preference towards the measures of overall job satisfaction regardless of their marital status. Also, length of time spent in New Zealand had no significant influence on the overall job satisfaction of participants.

**Table 4: Effect of demographic towards overall satisfaction**

Demographic variable	Categories considered	Type of statistical test	$p$ -value			Outcome(s)
			OS1	OS2	OS3	
Gender	Male and female	Independent-sample t-test	0.634	0.560	0.478	$H_0$ accepted for OS1-3
Marital status	Married and unmarried	Independent-sample t-test	0.119	0.335	0.114	$H_0$ accepted for OS1-3
Time spent in NZ	All categories*	One-way ANOVA	0.124	0.162	0.881	$H_0$ accepted for OS1-3
Age	All except 55+*	One-way ANOVA	0.013	0.033	0.107	$H_0$ rejected for OS1 and OS2; $H_0$ accepted for OS3
Educational background	All except 'trade school' and 'none'*	One-way ANOVA	0.016	0.023	0.408	$H_0$ rejected for OS1 and OS2; $H_0$ accepted for OS3

\* see conducted. Table 2 shows the demographic information of migrant construction workers from whom data were collected.

Regarding age, the '55+ years' category was eliminated from the analysis due to sample inadequacy. A Levene's test was conducted to ensure that the assumption of the homogeneity of variances was satisfied under the ANOVA test. The  $p$ -values were 0.994, 0.974 and 0.535 for OS1, OS2 and OS3 respectively. In addition, the mean population agreement was significantly different for at least one age category – specifically, for OS1,  $F=3.332$ ,  $p=0.013$ ; whilst for OS2,  $F=2.751$ ,  $p=0.033$ . This implies age does not influence the willingness of participants to continue work in NZ [ $F=1.960$ ,  $p=0.107$ ]. To find out which group mean is significantly different, a Tukey test was conducted as a post-hoc test. The only statistically significant mean difference was between '25–34 years old' and '45–54 years old' for both OS1 ( $p=0.005$ ) and OS2 ( $p=0.017$ ). By observing this mean difference further, evidence suggests the '45–54 years old' age group is generally happier than other age groups and will recommend NZ to others as a good country in which to work.

Under educational background, two categories [participants who ticked 'trade school' and 'none'] were eliminated due to limited data. Using Levene's test, the assumption of homogeneity of variances was satisfied [ $p=0.488$ , 0.181

and 0.573 for OS1, OS2 and OS3 respectively]. ANOVA test showed mean population agreement was significantly different for at least one category of educational background: for OS1,  $F = 2.966$ ,  $p = 0.016$ ; whilst for OS2,  $F = 2.551$ ,  $p = 0.023$ . This evidence suggests educational background does not influence participants' willingness to continue work in NZ [ $F = 1.024$ ,  $p = 0.408$ ]. According to a Tukey test, participants who possessed 'under high school' qualifications showed a greater general satisfaction (OS1) than holders of Bachelors' degrees ( $p = 0.004$ ) and post-graduate qualifications ( $p = 0.023$ ). Participants who possessed 'under high school' qualifications were more likely to recommend NZ as a country to work than holders of Bachelors' degrees ( $p = 0.044$ ) and post-graduate qualifications ( $p = 0.037$ ).

### **Moderating effects of participants' demographics towards independent determinants of job satisfaction**

To determine the moderating effects of participants demographics towards independent determinants of overall job satisfaction, the study considered their ages and educational backgrounds. This is because these were the only demographic variables that influenced overall job satisfaction (i.e. the main focus of this paper). The following hypotheses were tested via one-way ANOVA. When the null hypothesis was rejected, a Tukey test was used to determine the specific groups showing significant differences.

$H_0$ : the population means are equal across the groups.

$H_a$ : the population means are not equal across the groups.

A summary of the analysis is presented in **Error! Reference source not found.**, which illustrates that age and educational background significantly influenced some of the overall job satisfaction determinants. Similar to the measures of overall job satisfaction, the 45—54 age group was more favourable than the 25—34 category towards nine determinants of OS1-2 [i.e. RNs1 and 5, WE1, KACPs2-5; QLWCs3 and 5]. This implies 80% of KACP factors were more favourably perceived by participants aged 45 to 54 years. In addition, there was a significant difference between the 45—54 and 35—44 categories towards RN5. Only three determinants were influenced by the educational background of participants (RNs 4 and 5, and LON1). When compared to holders of Bachelors' and post-graduate qualifications, workers who earned no more than high school qualifications were more favourable towards RNs 4 and 5, although they felt lonelier than participants who had earned at least one degree (LON1).

Table 5: Favourability towards the determinants of overall satisfaction

Factor	Rank*	Sample Mean ( $\mu_s$ )	Std. Deviation (Sample)	Population mean ( $\mu_0$ )	Effect of:			Educational background [interpretation; statistical evidence]	
					Age [interpretation; statistical evidence]		Supporting evidence [One-way ANOVA (p-value) followed by Tukey HSD (p-value)*]		
					Interpretation	Supporting evidence [One-way ANOVA (p-value) followed by Tukey HSD (p-value)*]			
RN1	6	3.75	1.128	3.90	(45-54) > (25-34)	$P_{ANOVA}=0.028$ ; $P_{Turkey}=0.05$	No effect	No effect	$P_{ANOVA}=0.121$
RN2	18	4.16	0.879	4.30	No effect	$P_{ANOVA}=0.324$	No effect	No effect	$P_{ANOVA}=0.969$
RN3	20	3.44	1.574	3.70	No effect	$P_{ANOVA}=0.255$	No effect	No effect	$P_{ANOVA}=0.459$
RN4	15	3.64	1.531	3.90	No effect	$P_{ANOVA}=0.139$	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	$P_{ANOVA}=0.003$ ; $P_{Turkey}=0.018$ for Bachelor versus Under High school $P_{Turkey}=0.018$ for Bachelor versus High school $P_{Turkey}=0.047$ for Postgrad versus Under High School $P_{Turkey}=0.039$ for postgrad< versus High School $P_{ANOVA}=0.622$
RN5	17	3.53	1.277	3.80	(45-54)>(25-34); (45-54)>(35-44)	$P_{ANOVA}=0.007$ ; $P_{Turkey}=0.046$ for (45-54)versus(25-34) $P_{Turkey}=0.030$ for (45-54)versus(35-44)	No effect	No effect	
RN6	13	3.59	1.596	3.80	No effect	$P_{ANOVA}=0.061$	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	$P_{ANOVA}=0.000$ $P_{Turkey}=0.000$ for Bachelor versus Under High school $P_{Turkey}=0.014$ for Bachelor versus High school $P_{Turkey}=0.000$ for Postgrad versus Under High School $P_{Turkey}=0.001$ for postgrad< versus High School $P_{ANOVA}=0.789$
RN7	19	3.22	1.375	3.10	No effect	$P_{ANOVA}=0.136$	No effect	No effect	
RNavg	N/A**	3.69	1.024	3.82					
WE1	16	4.38	0.693	4.50	(45-54)>(25-34)	$P_{ANOVA}=0.002$ ; $P_{Turkey}=0.008$	No effect	No effect	$P_{ANOVA}=0.111$
WE2	8	4.35	0.769	4.40	No effect	$P_{ANOVA}=0.063$	No effect	No effect	$P_{ANOVA}=0.571$
WE3	11	4.06	0.973	4.00	No effect	$P_{ANOVA}=0.088$	No effect	No effect	$P_{ANOVA}=0.184$
WEavg	N/A	4.3	0.648	4.39					
KACP1	21	4.32	0.839	4.40	No effect	$P_{ANOVA}=0.187$	No effect	No effect	$P_{ANOVA}=0.399$
KACP2	14	4.15	0.930	4.00	(45-54)>(25-34)	$P_{ANOVA}=0.014$ ; $P_{Turkey}=0.024$	No effect	No effect	$P_{ANOVA}=0.339$
KACP3	12	4.25	0.875	4.40	(45-54)>(25-34)	$P_{ANOVA}=0.003$ ; $P_{Turkey}=0.047$	No effect	No effect	$P_{ANOVA}=0.414$
KACP4	5	4.26	0.883	4.40	(45-54)>(25-34)	$P_{ANOVA}=0.048$ ; $P_{Turkey}=0.034$	No effect	No effect	$P_{ANOVA}=0.381$
KACP5	7	4.24	0.935	4.40	(45-54)>(25-34)	$P_{ANOVA}=0.015$ ; $P_{Turkey}=0.05$	No effect	No effect	$P_{ANOVA}=0.340$
KACPavg	N/A	4.29	0.735	4.40					

QLWC1	10	4.09	1.006	4.00	No effect	$p_{ANOVA}=0.492$	No effect	$p_{ANOVA}=0.778$
QLWC2	3	4.18	1.014	4.30	No effect	$p_{ANOVA}=0.954$	No effect	$p_{ANOVA}=0.449$
QLWC3	1	4.11	0.937	4.00	$(45-54)>(25-34)$	$p_{ANOVA}=0.047$ ; $P_{Turkey}=0.002$	No effect	$p_{ANOVA}=0.063$
QLWC4	4	4.06	0.998	4.00	No effect	$p_{ANOVA}=0.100$	No effect	$p_{ANOVA}=0.765$
QLWC5	2	4.10	1.005	4.00	$(45-54)>(25-34)$	$p_{ANOVA}=0.038$ ; $P_{Turkey}=0.041$	No effect	$p_{ANOVA}=0.056$
<b>QLWCavg</b>	<b>N/A</b>	<b>4.11</b>	<b>0.858</b>	<b>4.20</b>				
LON1	=22	3.45	1.375	3.70	No effect	$p_{ANOVA}=0.275$	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	$p_{ANOVA}=0.021$ $P_{Turkey}=0.024$ for Bachelor versus Under High school $P_{Turkey}=0.044$ for Bachelor versus High school $P_{Turkey}=0.028$ for Postgrad versus Under High School $P_{Turkey}=0.014$ for postgrad< versus High School
LON2	=22	3.17	1.432	3.00	No effect	$p_{ANOVA}=0.604$	No effect	$p_{ANOVA}=0.816$
LON3	9	4.01	1.088	4.00	No effect	$p_{ANOVA}=0.488$	No effect	$p_{ANOVA}=0.682$



## Discussion of the Findings

This research has highlighted the significance of migrants as a solution to addressing the skills shortages seen within the NZCI. The economic importance of the migrant construction workforce is acknowledged (MacLennan, 2018). However, as little is known about their working conditions, perceptions of their work environments and the level of their goal achievements in their new environment (NZ), the current study finds its relevance. Yalabik, Rayton and Rapti (2017) had made a note of the importance of job satisfaction as a driver of all dimensions of work engagement, which could positively impact on the productivity of the national workforce. The need to capitalise on the full potential of the migrant construction workforce cannot be overemphasised. In this study, we investigate Chinese migrant construction workers satisfaction in relation to their overall job satisfaction in NZ. Thus, the study provides insights into the moderating effect of migrants' demography on the determinants of job satisfaction within the NZCI.

Three hypotheses were developed and tested to address the study objective. The first hypothesis (H1) sought to establish how satisfied respondents were with their jobs overall. There was a general agreement of satisfaction between study participants, which indicated they would like to extend their stay and were most likely to recommend NZ as a good place to work. The first hypothesis (H1) was therefore accepted. This is new knowledge considering the absence of literature within the social science field on construction migrants in NZ. The comparison of the population means indicated that Chinese construction workers were more favourable towards OS3 (willingness to continue work in New Zealand) with compared to OS1 (generally satisfied with work) and OS2 (New Zealand is a good place to work). Within this quantitative study, it was not possible to find 'why'. Potentially, this may be because OS1 and OS2 are more specific measures of 'work environment' whereas OS3 could be influenced by factors outside of work such as improved living conditions and better education for children with compared to the homeland. A qualitative investigation is required to find out these additional factors. Also, OS1 and OS3 showed only a moderately strong association ( $r=0.588$ ;  $p=0.000$ ). These substantiate that there are factors outside of work that influence willingness to live in New Zealand.

The second hypothesis (H2) focused on the moderating effect of the demography of Chinese construction migrants on job satisfaction. Although the literature review showed inequality issues and discrimination worldwide against women in the construction industry, the study found that the overall job satisfaction expressed by the study participants was irrespective of their gender. This could be because the New Zealand government and construction industry stakeholders have a significant and shared commitment to ensure gender equality and diversity (Construction Sector Accord 2020). Nevertheless, equal satisfaction cannot be considered valid for other women populations – such as New Zealanders and Pacific Islanders – as their cultural and social constructs may be significantly different from Chinese women. The study also showed that the length of stay in NZ did not determine job satisfaction significantly. Thus, it could be expected that it is easy to become adapted to New Zealand work environments. As shown in Table 5, the average population mean for the WE factors is 4.39, indicating favourable construction work environments in New Zealand.

The literature review showed that marital status could influence job satisfaction in migrant workers; nevertheless, both married and unmarried Chinese migrant workers are equally favourable towards overall job satisfaction. According to literature (Mohsin et al., 2019), the effect of marital status gets diminished when the host government is committed towards migrant workers' wellbeing via commitment to international protocols and local legislations. Nevertheless, the current study's methodological position is inadequate to explain this equal favourability credibly. Firstly, the current study did not evaluate if the married migrant workers left their families behind or moved with them. Secondly, there is a future study requirement to assess how New Zealand work environments and living conditions help migrant workers cope with depressive symptoms when leaving their families behind.

However, in terms of age, the study revealed that participants within the 45–54 age group were happier than those in other age groups and would recommend NZ to others as a good country in which to work. It should be noted that the above 55 group was not considered under this analysis. Compared to younger migrant workers, middle-aged workers typically have added family commitments such as supporting children's education and looking after aged parents. Coupled with favourable income levels (see Table 5), an ability to fulfil these commitments could enhance job satisfaction in this age category. Also, the middle-aged workers have more positive reaction towards job stability when compared to younger generations that prioritise travelling, leisure and adventures. Thus, the field study findings are consistent with the reviewed literature.

Another important demographic was educational background; the study found that participants with high school qualifications (and below) were more likely to recommend NZ as a country in which to work. This finding is consistent with Gonzales, Sanchez and Lopez-Guzman (2016) that workers with lower educational levels are more likely to express higher levels of appreciation for work that they have been able to secure and maintain. Our study did not investigate the Chinese migrants' previous employment (or employability) status in their home country, which may be significant to their responses to job satisfaction in their new environment.

Finally, the last hypothesis (H3) tested the moderating effect of the demographic status of migrant Chinese construction workers on the determinants of job satisfaction. Our findings indicate that age and educational backgrounds had significant influence on some of the determinants of overall job satisfaction. Older migrants (45–54 years) tended to be more favourable to the determinants of overall satisfaction. In contrast, participants' educational backgrounds influenced only three determinants (RNs 4 and 5, and LON1). Furthermore, migrants with lower qualifications were more favourable towards RNs 4 and 5, although they felt lonelier than participants who had earned at least one degree (LON1).

Considering that age and educational background significantly influenced both independent and dependent variables, a correlation analysis will be inappropriate to test the hypothesis in future. That '*RN/WE/KACP/QLWC/LON influences Chinese migrant worker's job satisfaction in the New Zealand Construction industry*'. Thus, a regression analysis could be employed to test this hypothesis while introducing age and educational background as moderating variables. The challenge is that these two moderating variables are categorical; compared to



continuous and dichotomous variables, they need specific attention before regression. Thus, the authors suggest re-coding these categorical variables using an appropriate coding system (see Institute for Digital Research and Education. 2021). The outcomes could elicit evidence to assist policymakers in developing strategic interventions regarding the enduring determinants of overall job satisfaction for a critical population of skilled immigrant construction workers in the NZCI.

## Conclusion

This study aimed to establish the moderating effect that demography has on the overall job satisfaction of Chinese migrant workers in the NZCI. It is an aspect of a more extensive study on the working conditions of migrant construction workers in NZ. The study identified gender, age, educational background, marital status and years of experience as personal characteristics that may influence migrants' perception of satisfaction within their host country, NZ. The current study results support the internal validity and reliability of these personal characteristics as moderators of job satisfaction for this category of migrant construction workers. Migrant Chinese construction workers over 45 years old were more satisfied with working conditions than younger migrants. Also, the educational background of these migrants (especially those less educated) was significant to overall perception of satisfaction. Both age and educational background were confirmed as moderators to the determinants of their job satisfaction within the NZCI. These findings are significant to future efforts by government and policymakers to address the perceived exploitations reported in the NZ media. Also, the findings may contribute to policy initiatives on the optimal categories of migrants engaged on construction activities to derive the maximum benefits for NZ. Finally, the study provides insights for organisations employing migrants about putting in place appropriate measures to enhance their satisfaction levels.

Similar empirical findings can contribute to improving living conditions and the overall achievement of expectations of life in the NZCI. It provides an alternative perspective to the immigration survey monitoring programme in New Zealand, because of its focus on a particular ethnic nationality that makes up a significant percentage of the migrant workforce. Further studies will build on the achievements of this current study to determine the holistic effects of participants' demographics against overall job satisfaction and the independent variables using a suitable regression analysis. This will elicit evidence to assist policymakers in developing strategic interventions regarding the enduring determinants of overall job satisfaction for a critical population of skilled immigrant construction workers in the NZCI.

There are limitations to the study findings. Firstly, the sample consists exclusively of Chinese construction migrant workers in Auckland city, NZ. Therefore, the generalisation of these research results to other migrant worker groups, should be made with caution. Despite this limitation, the current study provides a meaningful beginning to exploring a largely ignored population in the NZ workforce. More studies are needed to focus on construction migrant workers from other cultural backgrounds. The second construct we measured in the current study was general job satisfaction. Therefore, findings in the present study should not be generalised to other, more specific aspects of job satisfaction. As mentioned previously, job satisfaction is a broad and multi-faceted construct. Migrant

workers' job satisfaction toward pay, management, and skill variety might have different predictors that need to be explored in more detail in future studies. Overall, the current study is encouraging, and fills the gap in the literature regarding construction migrant workers' job satisfaction in NZ. More studies are needed in this field to explore the antecedent and consequent effects of these key elements. In the future, involving other construction migrant worker groups and even local-born workers could extend the current study, as would the coverage area extension to other cities or locations in NZ.

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## Migrant construction workers' demography and job satisfaction: A New Zealand study

### Abstract

**Purpose:** The demand for construction-related occupations has increased consistently over many years in New Zealand (NZ). This has necessitated a recourse to migrant workers to address capacity and capability requirements. Migrant construction workers hail from a variety of various backgrounds with a complex set of their needs being met through employment in NZ. Research on understanding the well-being satisfaction levels of this category of construction workers is scarce; therefore, the well-being of. With recent insinuations about migrant construction worker exploitations, research investigations into this knowledge area is investigated using job satisfaction as an indicator. This significant. In this study we sought to establish the moderating effect of migrants' demography on the determinants of job satisfaction in NZ's construction sector.

**Research design:** Data was obtained from migrant construction workers of Chinese extraction through a structured questionnaire survey. From a total of 200 questionnaires administered, 108 samples were completed by migrant construction workers involved in major projects in Auckland city, NZ. Data obtained were analysed using both descriptive and inferential statistics to establish the moderating effects of their demography on job satisfaction of the units of analysis.

**Findings:** Results from this study support the internal validity and reliability of these personal characteristics as moderators of job satisfaction. This suggests for migrant construction workers. These results suggest the relevance of personal characteristics of Chinese migrants in any wellbeing objectives improvement initiatives being implemented developed for this group of construction workers.

**Research limitations/implications:** The findings from this study contribute to the discourse on the relevance of construction migrants as a strategic alternative to addressing skill shortages within the NZ construction sector. They also provide evidence that contributes to an improved understanding of the migrant workforce to assist in meeting meet their aspirations and to enhance their general well-being.

**Originality/value:** Although the study is ethnic-specific, the conclusions show the relevance of personal characteristics in the experiences of construction migrant workers. The study is representative of the catchment of temporary migrant workers in the construction industry in NZ. The study provides insights to for organisations employing migrants about putting in place appropriate measures to enhance their well-being satisfaction levels. Finally, this study's findings may contribute to policy initiatives on the optimal categories of migrants engaged on construction activities to derive the maximum benefits for NZ.

**Keywords:** Construction; workers; Demography; Migrant workers; Job satisfaction

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## Introduction

New Zealand's construction industry [NZCI] has witnessed considerable year-on-year growth since 2011. Annual growth within the industry averaged 6.60-per cent% between 2011 and 2015, slowing gently thereafter until 2019 when the COVID-19 pandemic hit (Granwal, 2020). Regardless, the NZCI's economic importance remains significant. According to recent report by NZ's Ministry of Business, Innovation and Employment (MBIE) (2020), ~~NZCI's~~ NZCI's Gross Domestic Product (GDP) contribution in 2020 was NZ\$16.2 billion – the equivalent of about ~~eight per cent~~8% of the national GDP. Another report by Stat NZ (2020) suggests NZCI is fourth amongst the top 10 industries that contribute to ~~the NZ's GDP's~~ national production measure ~~of NZ's GDP~~, and the fifth-largest sector in terms of employment. When combined with other sectors that provide services related to construction, NZCI accounts for just under 200,000 people, which translates to about 10-per cent% of total national employment.

Various NZCI growth triggers have been reported. ~~In particular, according~~According to Bretherton (2017), there were increased construction activities after the 2010 and 2011 Christchurch earthquakes due to the city's rebuild programme. ~~The majority~~Most of ~~the~~ construction works in NZ's major cities have been due to population growth and ~~an expansion in~~ economic activities, resulting in a ~~bigger~~more considerable demand for different infrastructural facilities such as housing, commercial building, transportation, communication, energy, and industrial projects. The phenomenal increase in economic activities across all NZCI subsectors heightened resource shortfalls amongst construction organisations. ~~A report by the~~The MBIE (2017) ~~report~~ projects the demand for construction-related occupations to rise by about 11-per cent% between 2016 and 2022, suggesting over 57,000 additional skilled workers will be required by 2022 to cope with the growth in demand. This skill requirement is a tough goal to achievechallenging because the industry is already in a state of acute skill shortage. A ~~news~~BDO (2020) NZ report ~~by~~had indicated concerns around the availability and quality of construction occupations. It had concluded from their investigations that the balance between quality and quantity of workers in the construction sector was precarious. Shortages of skilled workers in construction industries are therefore prevalent. Jackson (2018) articulates the difficulties faced by industry associations in the United States' construction sector ~~regarding the shortage of skilled workers. The report shows 78 per cent. For instance, 78% of Associated General Contractors of America members had trouble finding qualified workers, while 82-per cent% of construction firms said they expected the unavailability of skilled labour to remain a difficult challenge or to worsen. In addition, another~~Another report by AECOM, a global premier infrastructure firm, showed skills and materials shortages were the highest ranked (at 43-per cent%) of the industry's most critical challenges (AECOM, 2019).

Many studies have acknowledged resource shortages as a common challenge in the construction industry globally, due to a wide range of factors (Dainty, ~~Ison & Briscoe, et al.,~~ 2005; Dhal, 2020; Ho, 2016; Juricic, ~~Galic & Marenjak, et al.,~~ 2021; Lobo ~~&and~~ Wilkinson, 2008; McGrath-~~Champ, Rosewarne & Rittau, Champet al.,~~ 2011). As a result, attracting skilled migrant workers has become a policy thrust ~~of policy~~ in many developed economies (Guo ~~&and~~ Al Ariss, 2015; Přívara, ~~Rievajová & Barbulescu, et al.,~~ 2020). Migrant workers are of considerable economic significance to the NZCI (MacLennan, 2018). Harkins (2016) explains how such migrant workers contribute to the economies of their ~~home and~~ host countries. ~~The author~~Harkins also offers some insight about the need to



understand the challenges faced by these workers, so appropriate measures can be put in place to ensure and enhance their well-being and economic outcomes ~~both in their home countries and where they are resident. However, the migrant construction workforce remains, wherever they are resident.~~ There is evidence of exploitation of construction migrant workers in NZ, some of which have necessitated recent changes to immigration policies (MBIE, 2021). Seale et al (2015) had reported that the vulnerability of temporary migrant workers in the construction industry had become an emerging issue. The rebuild programme exacerbated exploitation after the 2012 Canterbury earthquake with noticeable pay differences between migrants and locals, and unhealthy living conditions (MacLennan, 2018). More recently, Kilgallon and Xia (2021) confirmed that Chinese migrants are overworked and underpaid. There is also a propensity for lower job security for migrant construction workers according to Buckley et al (2016). MacLennan's (2018) seminal work on Filipino construction workers is hereby acknowledged; however, little is known of Chinese migrant worker situations in NZ. In 2017, 9% of temporary work visa holders came from China (MBIE, 2017). We submit that migrant construction workforce remain largely understudied in NZ's social science research.

Such a knowledge gap is consequential. In an industry where job satisfaction remains an ongoing issue (see Macky and Boxall, 2008, ~~for example~~), it is important to understand how migrant workers moderate this. For greater clarity, van der Westhuizen, ~~Pacheco & Webber et al.~~ (2012), Pacheco, ~~van der Westhuizen, Ghobadian, Webber & O'Regan et al.~~ (2016), and Kwok, ~~Cheng & Wong et al.~~ (2015) have explained the role of culture in determining job satisfaction. Thus, it is ~~important~~ essential to ~~determine~~ establish whether the same determinants of (dis)satisfaction speak to migrants and indigenous workers the same way; and, if at all, whether there are demographic nuances to outturn effects of the determinants of (dis)satisfaction on migrants or indigenous workers in the NZCI. This current study seeks to identify the determinants of job (dis)satisfaction for migrant construction workers using a representative sample of Chinese ethnic groups who hold temporary visas and work in the NZCI. ~~Chinese construction workers were selected for the study because they are significant in number, they work on large projects, and are well entrenched as a significant component of the local diversified workplace.~~

#### Determinants of ~~job satisfaction~~ Job Satisfaction and ~~demographic measures~~ Demographic Measures

It is critical to consider the nuances arising from the ways migrants and the indigenous workforce view job satisfaction. However, normative literature seldom considers this definitively; and, where it does, comparisons between migrant and indigenous workforce satisfaction are ~~largely~~ mainly inconclusive, especially around the demographics and ecosystems of work (see Wahi et al., 2020, on the future of work and the modern workplace as an ecosystem).

Understanding such nuances does not render extant applied psychology theories less valid; ~~rather,~~ Instead, it is ~~important~~ crucial to know whether these would help future studies better understand job satisfaction and the specific implications of situating migrants and indigenous workforces within the broader industry. Wang and Jing (2018) provide insights into work- or non-work-related factors that could influence immigrants' job satisfaction, either

independently or in combination. Within their postulations of non-work-related factors are three main categorisations: general demographic factors, culture-related factors and community-related factors. The current study considers the moderating influence of general demographic factors on job satisfaction. We focus on Chinese immigrant workers within the NZCI as the host community; these are intended to act as proxies for culture and community-related factors. The following subheadings provide brief outlines of the demographic measures used in the current study.

### General demographic measures

Previous studies provide empirical justification of the variability in job satisfaction levels between immigrants from different backgrounds. Magee ~~&and~~ Umamaheswar (2011) and Ko et al. (2015) contend that immigrants' backgrounds are significant in job satisfaction studies because of the tendency of migrants to choose different reference systems to evaluate job conditions in their host country. Furthermore, variable responses to job experiences can be explained by migrants' needs, prior experiences and work orientation that are likely to be specific to their countries of origin. We expand on these general demographic factors in the following paragraphs.

### Understanding measures of demography

#### Gender

Bussey (2011) explains the underlying importance of gender as a means of self-definition in most societies. Bussey's story draws a line of distinction between sex and gender: sex as a biological denominator; gender as the way people want to be identified. Nonetheless, beyond identification, societal complexities around gender identification and discrimination have been well documented. For example, Gartzia ~~&and~~ Lopez-Zafra (2016) ~~explain~~~~explained~~ such complexities include equality issues in the sense of inclusion, wage discrimination, equal opportunities and cultural segregation, ~~as well as~~~~and~~ marriage and education biases. There is also a political side ~~to this~~: many countries have ~~differing~~~~different~~ cultural orientations, public perceptions and reforms regarding gender identities and rights. For example, some countries still struggle with ~~the acceptance of~~~~accepting~~ same-sex marriage and transgender outlooks – these can attract severe penalties in such parts of the world. Thus, gender as an issue is a reasonable cause for migration. People tend to move to ~~locations~~ where they achieve safety, inclusion, acceptance, ~~fulfilment~~~~fulfillment~~, personal values, freedom and career opportunities, ~~rather than remain burdened by~~. ~~They tend to avoid places where~~ societal complexities around their gender ~~could burden them~~.

#### Age

Age is a ~~popular~~~~widespread~~ basis for differentiation across the strata of social structure (Linton, 1936). It defines inclusion and exclusion regarding work and entitlements, critical life decisions regarding work and family, and the attraction of migrating to seek improved work satisfaction or leisure. A study by Ajayi ~~&and~~ Olatunji (2017) found ~~that~~ some employees are more inclined to voluntary turnover for ~~reasons of~~ mobility within certain age brackets. Gazioglu ~~&and~~ Tansel (2006) found a U-shaped relationship between worker age and job satisfaction – aspirations to remain in a job are highest amongst young and old workers. ~~Whilst~~~~While~~ it is logical that young people are often

inclined to explore opportunities and seek freedom through mobility, middle-aged workers are often attracted to stability and have commitments beyond work ~~as reasons~~ to stay in a job. These perceptions shape the decision to migrate, as well as job satisfaction and turnover.

### **Educational background**

Education can be considered a key source of self-improvement and could be a prerequisite for growth and advancement in career and professional goals. Education can enhance esteem, confidence, skills and competencies, career success, self-efficacy and future career expectations (Baruch ~~&and~~ Peiperl, 2000). Several studies have associated levels of education with job satisfaction. González, Sánchez ~~&and~~ López-Guzmán (2016) believe that an employee's education level is an important variable that is strictly personal in nature, and that the higher the level of education, the more employment options are available. Nikolaou, Theodossiou ~~&and~~ Vasileiou (2005) argue that job satisfaction levels increase with education levels because workers ~~are able to can~~ gain the ~~rightcorrect~~ employment positions to help them live a great life. Other authors have argued that higher job satisfaction comes from ~~the~~ higher income (Bakan ~~&and~~ Buyukbese 2013), better employment benefits (Pandey ~~&and~~ Asthana 2017) and career advancement opportunities (Mehdiabadi ~~&and~~ Li, 2016; Ling et al., 2018) ~~that~~ higher educational backgrounds provide.

However, in contrast, Clark ~~&and~~ Oswald (1996) contend the higher the level of educational attainment, the lower the satisfaction level reported by job holders. A more recent study in Spain found that educational levels do not ~~actually~~ influence job satisfaction (Gonzalez, Sanchez ~~&and~~ Lopez-Gunzman (2016). The argument is that higher educational levels impact negatively on overall satisfaction in certain jobs (Clark ~~&and~~ Oswald, 1996; Gazioglu ~~&and~~ Tansel, 2002; Grund ~~&and~~ Slivka, 2001; Sloane ~~&and~~ Williams, 1996). According to González et al. (2016) and Lam, Zhang ~~&and~~ Baum (2001), education may raise ~~an employee's employees'~~ expectations, depending on their personal and professional aspirations. Such employees could also become more discerning regarding improper work contexts that could impact their mental and physical health (Gürbüz, 2007).

For ~~the purposes of~~ the current study, we align with the reflection theory explained in Froese, Peltokorpi, Varma ~~&and~~ Hitotsuyanagi-Hansel (2019) that more educated migrants are more likely to exhibit greater job satisfaction. ~~Especially~~ when they perceive that their work performance counts towards their ~~personal~~ achievements within their host country.

### **Marital status**

Marital status can be significant in determining the level of satisfaction of migrant workers. Depending on immigration status, they are either able to travel alone or not. Knipe et al. (2019) ~~explains the majority of explain~~ ~~that most~~ Asian migrant workers have temporary visas and emigrate without their families. ~~When compared~~ ~~Compared~~ to unmarried men and women, married migrant workers face additional issues, chiefly due to ~~spousalmarital~~ separation and an inability to ~~fulfil~~ ~~fulfill~~ some parental responsibilities. The moderating effect of marital status is studied in global literature with respect to the well-being of migrant workers and those who are left behind (Knipe et al., 2019; Lei et al., 2020; Shattuck et al., 2019; Tong et al., 2019). Tong et al. (2019) found the



psychological consequences of family separation are largely underexplored in Chinese migrant workers. These authors found that depressive symptoms are more prevalent in married adults who emigrated from rural areas of China.

Furthermore, because of additional household commitments and a reduced level of intimacy, spouses left behind in China may also experience elevated stress levels ~~of stress~~. This Stress may eventually have a consequential effect on the psychological well-being of the migrant worker and, thus, their job satisfaction. In contrast, migrant workers may have ~~an enhanced level of~~ job satisfaction because of their ability to provide a better economic environment for their dependents (Hadi, 1999; Shattuck et al., 2019). Another possibility is that Chinese migrant workers may move to New Zealand with their families. Global literature shows they may face additional work-life balance issues because of competing priorities such as caregiving and breadwinning (Khanh et al., 2020). Eventually, their overall job satisfaction may be impaired. Mohsin et al. (2019) ~~explain~~ explain that the prevalence of these issues is different from one context to another depending on host governments' commitments to international protocols and local legislation that could focus on migrant workers' goal achievements and well-being. Therefore, in the current study, marital status ~~was~~ is considered ~~as~~ a demographic variable that could influence overall job satisfaction, either in isolation or in combination with other personal characteristics.

### ***Years of experience***

The last measure relating to general demography is the length of migrant ~~workers'~~ workers experience. We have taken the premise that workers could perceive their job satisfaction differently based on their ~~levels of~~ experience levels. Prior work experiences may mean migrant workers have more reference points with which to compare their work situations. For example, Badawy (1994) has shown that work experiences, coupled with career expectations, relate to satisfaction because of perceived confidence and competence in doing work. In another regard, Okpara (2004) argues that the more ~~the~~ work experience, the more ~~the~~ respect ~~that~~ workers have for their jobs, which could translate to greater job satisfaction. Latiff et al. (2017) contended that this was the case for teachers' job satisfaction levels, ~~which increase~~ increasing with their ~~length of service~~ length.

Furthermore, Bilgic (1998) concludes that work experience contributes positively to feeling good ~~toward~~ about one's job. Although, feeling good may be impaired by discrimination, especially discrimination against migrants' ~~personal~~ characteristics such as their ~~level of~~ experience level. A perception of inferior work experiences (however useful these may be) may cause reduced psychological well-being and, consequently, lower job satisfaction (Wang ~~&~~ and Jing, 2018). Townsend et al. (2014) report on this lack of trust in prior abilities for immigrants, which we consider significant to their level of job satisfaction.

### ***Conceptual model*** General measures of job satisfaction

Many studies have examined numerous attributes of job satisfaction amongst workers. Normative knowledge about job satisfaction has matured over several decades. For example, a survey of public employees by Brayfield, Wells and Strate (1957) found employees who are not satisfied with their jobs often lack a general sense of satisfaction in other areas of their lives. The same argument is relevant today: if migrant workers are to have some pleasant



experiences in their mobility, it is important that they are pleased with their work as with their lives generally. What these mean to workers in different industries and across nuanced demographics have been measured by various authors. Tian, Wang and Chia (2018) found migrant skilled workers in Australia are keener on skill utilization than just having a job. However, migrants' opportunities to migrate and integrate themselves in their new nation depend on two crucial factors: whether they are satisfied with their host nation and communities, and whether there are considerable policies in such a host nation and communities that facilitate what migrant workers might consider attractive in terms of labour relation and social security. According to a finding by Randeree (2008), skilled migrants are often not attracted to societies that are notorious for labour injustice or are not known for social investments that are hospitable to migrant workers.

Other studies have further investigated workers' general satisfaction into specific elements. Evidence suggests workers would prefer to be paid well, on time and that they receive benefits and entitlements that do not discriminate them negatively (Card et al. 2012; Steinmetz, de Vries and Tijdens 2014). In addition, voluntary turnover risks have reduced where workers received paid leave, medical insurance and can afford their health costs, and where they receive considerable housing benefits (Lee, Hsu and Lien 2006; Ajayi and Olatunji 2017).

In addition, Jaskyte et al. (2020) also suggests that the work environment is critical to employees' job satisfaction. For migrant workers, they need to know whether their host communities value them; in that, they can put their skills to use, they can integrate in the society, they understand their work requirements and that their work provides them considerable opportunities for advancement. Such advancement would mean that workers are able to improve their knowledge and skills, as well as their career (Oyewobi, Suleiman and Muhammad-Jamil 2012; Tsai 2008). Felstead et al. (2015) view is that an organisation that allows their employees to advance their knowledge and career opportunities often benefits from workers' goodwill as workers generate self-led enablement through creativity, continuous renewal through active learning, and are able to develop their special abilities. Zou and Sunindijo (2013) found that the quality of employees' knowledge will determine their self-awareness and commitment to safe work practices and the regulatory codes and standards in relation to their duties.

Ajayi and Olatunji (2017) have examined the role of leadership quality in workers' voluntary turnover. They found employees connect to their jobs through their leaders, supervisors and work colleagues. A notable finding in their study is that leaders and direct supervisors must be capable of providing clear instruction to the employees under them, and such employees must see them as trustworthy and a go-to person, including for personal and confidential conversations. Li et al. (2018) add loneliness to this: migrant workers are often vulnerable to a high level of loneliness. This could draw away from their level of affective commitment and their engagement and participation. This can only worsen when they lack companionship at work, or feel isolated or unwanted.

### **The Study Variables**

It is evident from the literature ~~review above~~reviewed that migrants' work satisfaction within the NZCI is under-reported. Specifically, it is unclear how personal characteristics shape job satisfaction amongst these Chinese migrant workers, and how job satisfaction amongst the migrant workers shapes overall well-being. It is important

to provide clarity on the relationship between demographic variables of migrant workers, their perceptions of job satisfaction and the ideals of job satisfaction amongst the general NZCI workforce. This study ~~is premised on the assumption~~ assumes that work attitude is shaped by multidimensional contexts, such as individual attributes, and job and organisational characteristics.

**Error! Reference source not found.** illustrates the codes of the dependent and independent variables used in the study. Overall satisfaction was the dependent variable; OS1—OS3 were the statements of measure. A ~~4—5 point~~ Likert scale was used to obtain responses from participants through a questionnaire survey. On this scale, '1' represents 'strongly disagree' whilst '5' represents 'strongly agree'. Mid-scale, '3' represents 'neutral'. At the end of the literature review, 23 factors (f) were selected as determinants of overall satisfaction. They were arranged under five sub-categories; remunerations (RN) (f=7); work environment (WE) (f=3); knowledge advancement and career progression (KACP) (f=5); quality of leadership and work colleagues (QLWC) (f=5); and loneliness (LON) (f=3). As with the dependent variables, ~~the same 4—5 point~~ similar 5 point Likert scale was used. It is expected these factors are positively correlated with general satisfaction, except LON1 and LON2 which may negatively influence general satisfaction.

**Table 1: Definition of variables**

Code	Variables	
	<b>Dependent variable</b>	
<b>OS</b>	<b>Overall satisfaction</b>	
OS1	I am generally satisfied with my work in New Zealand	
OS2	I will recommend this country as a good place to work	
OS3	I would like to continue working in New Zealand if I was given the opportunity	
	<b>Independent variables</b>	
<b>RN</b>	<b>Remunerations</b>	
RN1	I am generally satisfied with my income level	QLWC <b>Quality of leadership and work colleagues</b>
RN2	I always get paid on time	QLWC1 My supervisor keeps me informed of the things I need to do to perform well in my job
RN3	I can get paid leave	QLWC2 My supervisor is fair and does not show favouritism
RN4	My employer offers medical insurance	QLWC3 I feel comfortable bringing up my personal issues with my supervisor and co-workers
RN5	I can afford my local health care	QLWC4 My supervisor is understanding when I talk about personal and family issues that affect my work
RN6	My employer offers accommodation	QLWC5 I have support from supervisor and co-workers that help me to manage my job and personal or family life
RN7	My employer offers other benefits for employees	
<b>WE</b>	<b>Work environment</b>	
WE1	I can adapt to the work environment of NZ	<b>LON</b> <b>Loneliness</b>
WE2	It's easy for me to understand the way work is done in NZ	LON1 I feel a lack of companionship at my place of work
WE3	I feel valued and recognised by my employer	LON2 My interest and ideas are not shared by those around me
KACP	<b>Knowledge advancement and career progression</b>	
KACP1	My job requires that I keep learning new things	LON3 There are people I can turn to for help or support

KACP2	My job requires that I be creative
KACP3	I have the opportunity to develop my own special abilities
KACP4	I understand the roles of health and safety in NZ
KACP5	I understand the standards and codes of NZ related to my duties

Migrant construction workers who are Chinese citizens were selected for ~~the~~this study (see Introduction). ~~This is~~ because they ~~are significant~~remain understudied in ~~number, they work on large projects and are well entrenched as a significant component of the local diversified workforce. The NZ.~~ This study sets the following hypotheses ~~were set~~ to evaluate the status and dependents of overall job satisfaction of the Chinese construction ~~workers'~~ populationworkers in New Zealand.

H1: Chinese construction workers are satisfied with their jobs overall.

H2: The demographic status of migrant Chinese construction workers moderates their job satisfaction.

H3: The demographic status of migrant Chinese construction workers moderates ~~remuneration, the~~ determinants of overall job satisfaction.

Figure 1 shows the conceptual model of the current research. The relationships among the overall job satisfaction and the independent variables (i.e. RN, WE, KACP, QLWC and LON) will be established only under future study; the scope of the current study is limited to evaluate the moderate effect of the demographics towards the dependent (H2) and independent (H3) variables. What are the practical implications of the outcomes of H2 and H3?

Testing H2 will assist to understand the variations of overall job satisfaction across the NZ Chinese construction worker's population. More importantly, the outcomes will determine the pre-requisites of the regression analysis required in future to determine the holistic effect from the independent variables and demographics towards overall job satisfaction. If any of the demographical variables significantly influences workers' job satisfaction, those categorical variables will require specific methods of transformation before regression compared to continuous variables (see the discussion). Some researchers may be interested in improving particular areas (for example: work environment, opportunities for knowledge advancement and career progression, support from their leaders at work and their co-workers, or loneliness and overall job satisfaction.) or variables of the independent category regardless of their effect towards employee's overall job satisfaction. For example, being valued or recognised (i.e. WE3) may or may not influence Chinese construction worker's job satisfaction significantly. Nevertheless, human right activists and unions may be interested in them. Therefore, the outcomes of H3 will be important in understanding the variations in perceptions of the independent variables across the population.

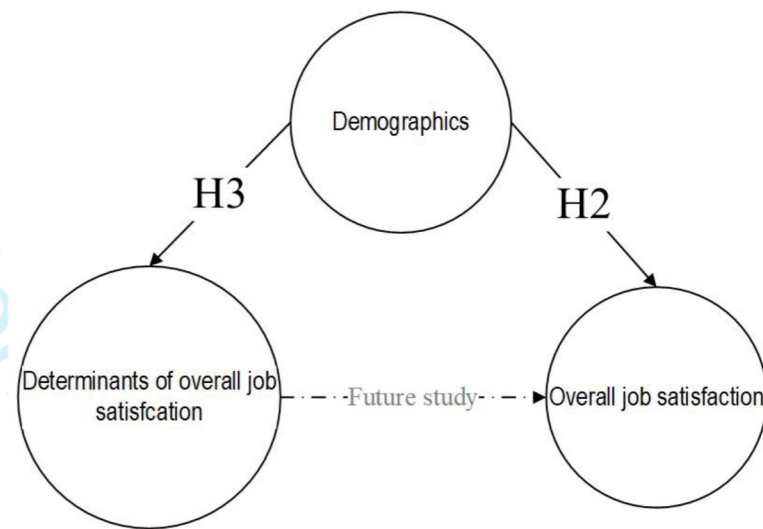


Figure 1: Conceptual framework of the study: the effect of demographics on overall job satisfaction and the determinants

## Research ~~method~~Method

This study uses explanatory research design to explain causal relationships between the different variables through hypothesis testing. Participants of the study are Chinese migrant construction workers plying their trades in Auckland. They hold Temporary Work Visas [TWVs] that last only for the duration of a project. Chinese construction workers were selected for the current study because little is known of their working conditions, perceptions of their work environments and the level of their goal achievements, yet they are significant in number, they work on large projects, and are well-entrenched as a substantial component of the diversified local workplace. The actual number of migrant Chinese construction workers on temporary work visa is currently unavailable. However, in 2019 there were 22,192 Chinese migrants that arrived on temporary work visa to New Zealand (Kilgallon and Xia, 2021). Auckland was chosen as the study area because it is the biggest city with more construction activities. A sample of 200 workers was taken by ~~random~~ purposive sampling, and questionnaires were administered to migrant construction workers employed on five major projects. Among this group, The participants were selected on the basis of a degree of homogeneity of their visa status. This is to ensure that the data collected was reliable and adequate (Alreck and Settle, 1995). Survey participants were accurately targeted using purposive sampling. This sampling approach permitted the selection of participants that represent a broad group of cases as closely as possible on a dimension of interest (Teddle and Yu (2007). 108 questionnaires were completed; among this group, representing a response rate of 54 ~~per cent~~% of the target population. All participants were aged above 18 years, with 92 ~~per cent~~% of them aged between 25 and 54 years old. Most respondents – 91 ~~per cent~~% – were males.

~~The questionnaire had four sections and required about 15 minutes to complete. It was developed in English before it was translated to Chinese (Mandarin). Participation was voluntary, and participants could choose between the English and Chinese versions of the questionnaire. Almost all the participants chose the Chinese version — this could be attributed to the fact that English is not an official language in China. A full breakdown of the demography of the participants is presented in Table 2. Before data analysis, internal consistency was checked for each sub-~~



group shown in **Error! Reference source not found.** using Cronbach's Alpha Reliability test. Findings suggested data were consistent internally (Cronbach's Alpha > 0.7). In addition, outliers were checked by observing histograms and box-plots. Using SPSS 26, a Little's Missing Completely at Random (MCAR) test was conducted at  $\alpha=0.05$ . Findings showed data were missing randomly, hence there was no requirement to impute missing data. Furthermore, normality was checked by observing the three central tendencies (mean, median and mode), and kurtosis and skewness. Findings show the central tendencies were close to each other and kurtosis and skewness were between  $\pm 1$  after the removal of outliers. Thus, the data distributions were considered as approximate normal, and means and standard deviation were selected over non-parametric measures to explain the sample data. One-sample t-tests were used to interpret population means. For all inferential statistical tests, the level of significance was set at  $\alpha=0.05$ . To check group-wise variations in the population means, independent samples' t-test and one-way ANOVA were used. Pearson correlations were used to interpret the associations among the dependent and independent variables. Table 2 shows the demographic information of migrant construction workers from whom data were collected. The Table reports data on participants' gender, age, nationality, educational qualification, marital status, work experience, and planned and actual length of stay in NZ.

**Table 2: Respondents' demographic information**

Description	Respondents	
	Number	Percentage
<b>Gender</b>		
Male	98	90.74%
Female	9	8.33%
Prefer not to answer	1	0.93%
<b>Age</b>		
18–24 years old	7	6.48%
25–34 years old	23	21.30%
35–44 years old	40	37.04%
45–54 years old	36	33.33%
55+ years old	2	1.85%
<b>Ethnicity</b>		
Chinese	107	99.07%
Southeast Asian	1	0.93%
<b>Educational background</b>		
Under high school	49	45.37%
High school	26	24.07%
Bachelor's degree	17	15.74%
Postgraduate qualification (Grad. Certificate, Grad. Diploma or Master)	12	11.11%
Trade school	2	1.85%
None	2	1.85%
<b>Marital status</b>		
Yes	90	83.33%
No	10	9.26%
In a relationship	2	1.85%
Prefer not to say	6	5.56%
<b>Year of work experience</b>		
0–5 years	27	25.00%
5–10 years	8	7.41%
10–15 years	23	21.30%
15–20 years	19	17.59%
20–25 years	10	9.26%
25+ years	21	19.44%
<b>How long have you been in NZ?</b>		
0–6 months	32	29.63%
7–12 months	28	25.93%
13–18 months	7	6.48%
19–24 months	12	11.11%
24+ months	29	26.85%
<b>How long do you plan to stay in NZ?</b>		
1–3 years	39	36.11%
4–6 years	18	16.67%
7–9 years	10	9.26%
10+ years	41	37.96%

The questionnaire for this study was developed based on the review of relevant literature on the measures of job satisfaction. A questionnaire survey was employed over other methods of data collection because it captures the perception of the construction migrant workforce regarding the significance of the identified variables as measures of job satisfaction. The questionnaire was physically distributed to the research participants on construction sites. This way it was possible to reach a representative group of migrant workers in a short time. The questionnaire had four sections and required about 15 minutes to complete. It was developed in English before being translated to Chinese (Mandarin). Participation was voluntary, and participants could choose between the English and Chinese versions of the questionnaire. Almost all the participants chose the Chinese version – this could be attributed to the fact that English is not an official language in China. A full breakdown of the demography of the participants is presented in Table 2. The Table reports data on participants' gender, age, nationality, educational qualification, marital status, work experience, and planned and actual length of stay in NZ.

## Data analyses

Before data analysis, internal consistency was checked for each sub-group shown in **Error! Reference source not found.** using Cronbach's Alpha Reliability test. Findings suggested data were consistent internally (Cronbach's Alpha > 0.7). In addition, outliers were checked by observing histograms and box-plots. Using SPSS 26, a Little's Missing Completely at Random (MCAR) test was conducted at  $\alpha=0.05$ . Findings showed data were missing randomly, hence there was no requirement to impute missing data.

To test normality, a series of Shapiro-Wilk (SW) tests was conducted after removing the outliers. The level of significance was less than 0.05 ( $p<0.05$ ) for all the variables. Thus, the data distributions were not 'precisely' normal. Since the non-parametric alternatives have limitations and accuracy issues, parametric tests could be still used and recommended if the data distributions are 'approximately' normal; (Cantor and Shuster 1992; Razali and Wah 2011; Smith 2012; Kwak and Kim 2017; Matulová and Rejentová 2021). To check the validity of approximate normality, numerical and graphical tests were conducted as there is no formal test to assist this (Smith 2012): after checking the Q-Q plots for all the distributions, there was no significant deviation between the snake like data distributions and straight lines. Thus, approximate normality could be assumed, but the interpretation of graphical tests can be overly subjective. Because of this, kurtosis and skewness were checked as additional means to substantiate this conclusion. The findings showed that both kurtosis and skewness were between  $\pm 1$  for the data distributions. Consequently, the data distributions were considered as approximate normal (Razali and Wah 2011): means and standard deviation were selected over non-parametric measures to explain the data.

One-sample t-tests were used to interpret population means. For all inferential statistical tests, the threshold was set as  $p\leq 0.05$ . To check group-wise variations in the population means, independent samples' t-test and one-way ANOVA were conducted. Table 2 shows the demographic information of migrant construction workers from whom data were collected.

## Results

### Overall job satisfaction

As per H1, Table 3 illustrates the sample statistics and population tendencies derived for the measures of overall job satisfaction. The sample means show participants were somewhere between 'somewhat agree' and 'strongly agree' towards OS1-3. The agreement was most positive towards OS3 ( $\mu_s=4.38$ ), followed by OS1 ( $\mu_s=4.22$ ) and OS2 ( $\mu_s=4.15$ ) respectively.

Table 3: Sample statistics and population tendencies – overall satisfaction

Statistics	N	Sample statistics				Population tendencies				Correlation (-: r (p value))	
		Mean	Median	Mode	Std. deviation	$\mu_0$	t	df	Sig. (2-tailed)	OS1	OS2
OS1	102	4.22	4	4	0.840	4.2	0.189	101	0.851	-	-
OS2	97	4.15	4	4	0.939	4.2	-0.476	96	0.635	0.763 (p=0.000)	-
OS3	104	4.38	5	5	0.816	4.5	-1.442	103	0.152	0.588 (p=0.000)	0.743 (p=0.000)

To find participants' agreement towards overall job satisfaction, one-sample t-tests were conducted. For the population mean ( $\mu$ ), the null ( $H_0$ ) and alternative ( $H_a$ ) hypotheses were set as below:

$H_0: \mu = \mu_0$  (the population mean is equal to the hypothesised population mean)

$H_a: \mu \neq \mu_0$  (the population mean is not equal to the hypothesised population mean)

By observing the sample mean and standard deviation, values, a trial-and-error procedure was employed to set the hypothesised population means for each dependent variable until one-sample t-test statistics indicated that the population mean was set to  $\mu_0 = 4.2$  for OS1 and OS2. For OS3,  $\mu_0$  was not significantly different to the hypothesised at 4.5-population mean. Only the accepted  $\mu_0$  values are shown in Table 3. The one-sample t-test statistics ( $p > 0.05$ ) showed that  $\mu$  was not significantly different from the  $\mu_0 = 4.2$  for OS1 and OS2 and  $\mu_0$  values (see 4.5 for OS3, Table 3). Therefore, the Chinese construction population has a preference between 'somewhat agree' and 'strongly agree' towards the continuation of their work in NZ (i.e. OS3;  $\mu = 4.5$ ). Their general satisfaction (OS1) and the perception of NZ as a good place to work (OS2) are slightly greater than 'somewhat agree' ( $\mu = 4.2$ ). According to a paired-sample t-test, Chinese construction workers are more favourable towards OS3, compared to OS1 [ $t = 2.259$ ,  $df = 98$ ,  $p = 0.026$ ] and OS2 [ $t = 3.742$ ;  $df = 93$ ;  $p = 0.000$ ]. In addition, Table 3 shows the three variables are significantly correlated at  $\alpha = 0.05$ . A strong positive correlation exists between OS1 and OS2 ( $r = 0.763$ ;  $p = 0.000$ ), between OS2 and OS3 ( $r = 0.743$ ;  $p = 0.000$ ), and between OS1 and OS3 ( $r = 0.588$ ;  $p = 0.000$ ).

#### Moderating effect of demographics towards general job satisfaction

As per H2, this study analysed the effects of migrant workers' demographics towards overall job satisfaction were analysed. The following were set as  $H_0$  and  $H_a$  to facilitate the analysis:

$H_0$ : the population means are equal across the groups.

$H_a$ : the population means are not equal across the groups

Table 4 shows the summary of the analysis, including the demographic variables considered. Under gender, only males and females were considered; this is because these two groups account for 99.1% of participants, and the third category of participants who prefer not to state their gender did not meet the minimum required sample size for comparison [ $n = 1$ ]. The proportion between male and female was approximately 11:1. Although there is no data with respect to Chinese construction workers living in New Zealand, generally, women account for less than 10%



in construction management positions while this percentage could be as low as 3-4% in the construction workforce (Naismith et. al., 2017; Hegarty 2020). Therefore, the sample distribution could be considered as a general representation of gender in the construction industry. Nevertheless, the low sample size in female may reduce the accuracy of the independent sample t-tests because of compromising the central limit theory (Kwak and Kim 2017). Therefore, as a secondary measure, the non-parametric alternative (i.e., independent sample median test) was also performed to compare the median across the two gender groups. Another issue was the possibility to violate homogeneity of variance: however, the independent sample t-test provided statistics to test this assumption before conclusions were derived.

Similarly, only married and unmarried participants were considered under marital status. To test the null hypothesis, an independent-sample t-test was used. Other demographical variables such as length of time spent in NZ, age and educational background had more than two categories; therefore, one-way ANOVA was used for them. For the three dependent sub-variables (i.e. OS1-3),  $p$ -values were greater than 0.05 for gender, marital status and length of time stayed in NZ. For gender, the independent sample median tests showed the median of OS1 ( $p=0.991$ ), OS2 ( $p=0.698$ ) and OS3 ( $p=0.478$ ) are the same for male and female. Therefore,  $H_0$  was accepted. This means both male and female participants had the same preference towards the measures of overall job satisfaction regardless of their marital status. Also, length of time spent in New Zealand had no significant influence on the overall job satisfaction of participants.

**Table 4: Effect of demographic towards overall satisfaction**

Demographic variable	Categories considered	Type of statistical test	$p$ -value			Outcome(s)
			OS1	OS2	OS3	
Gender	Male and female	Independent-sample t-test	0.634	0.560	0.478	$H_0$ accepted for OS1-3
Marital status	Married and unmarried	Independent-sample t-test	0.119	0.335	0.114	$H_0$ accepted for OS1-3
Time spent in NZ	All categories*	One-way ANOVA	0.124	0.162	0.881	$H_0$ accepted for OS1-3
Age	All except 55+*	One-way ANOVA	0.013	0.033	0.107	$H_0$ rejected for OS1 and OS2; $H_0$ accepted for OS3
Educational background	All except 'trade school' and 'none'*	One-way ANOVA	0.016	0.023	0.408	$H_0$ rejected for OS1 and OS2; $H_0$ accepted for OS3

\* see conducted. Table 2 shows the demographic information of migrant construction workers from whom data were collected.

Regarding age, the '55+ years' category was eliminated from the analysis due to sample inadequacy. A Levene's test was conducted to ensure that the assumption of the homogeneity of variances was satisfied under the ANOVA test. The  $p$ -values were 0.994, 0.974 and 0.535 for OS1, OS2 and OS3 respectively. In addition, the mean population agreement was significantly different for at least one age category – specifically, for OS1,  $F= 3.332$ ,  $p=0.013$ ; whilst for OS2,  $F= 2.751$ ,  $p=0.033$ . This implies age does not influence the willingness of participants to continue work in NZ [ $F= 1.960$ ,  $p=0.107$ ]. To find out which group mean is significantly different, a Tukey test was conducted as a post-hoc test. The only statistically significant mean difference was between '25—34 years old' and '45—54 years old' for both OS1 ( $p=0.005$ ) and OS2 ( $p=0.017$ ). By observing this mean difference further,

evidence suggests the '45—54 years old' age group is generally happier than other age groups and will recommend NZ to others as a good country in which to work.

Under educational background, two categories [participants who ticked 'trade school' and 'none'] were eliminated due to limited data. Using Levene's test, the assumption of homogeneity of variances was satisfied [ $p=0.488$ ,  $0.181$  and  $0.573$  for OS1, OS2 and OS3 respectively]. ANOVA test showed mean population agreement was significantly different for at least one category of educational background: for OS1,  $F=2.966$ ,  $p=0.016$ ; whilst for OS2,  $F=2.551$ ,  $p=0.023$ . This evidence suggests educational background does not influence participants' willingness to continue work in NZ [ $F=1.024$ ,  $p=0.408$ ]. According to a Tukey test, participants who possessed 'under high school' qualifications showed a greater general satisfaction (OS1) than holders of Bachelors' degrees ( $p=0.004$ ) and post-graduate qualifications ( $p=0.023$ ). Participants who possessed 'under high school' qualifications were more likely to recommend NZ as a country to work than holders of Bachelors' degrees ( $p=0.044$ ) and post-graduate qualifications ( $p=0.037$ ).

### **Moderating effects of participants' demographics towards independent determinants of job satisfaction**

~~In order to find out~~To determine the moderating effects of ~~participants'~~participants demographics towards independent determinants of overall job satisfaction, ~~the study considered~~ their ages and educational backgrounds ~~were considered~~. This is because these were the only demographic variables that influenced overall job satisfaction (i.e. the main focus of this paper). The following hypotheses were tested via one-way ANOVA. When the null hypothesis was rejected, a Tukey test was used to ~~find out~~determine the specific groups showing significant differences.

$H_0$ : the population means are equal across the groups.

$H_a$ : the population means are not equal across the groups.

A summary of the analysis is presented in **Error! Reference source not found.**, which illustrates that age and educational background significantly influenced some of the ~~determinants of~~ overall job satisfaction ~~significantly~~determinants. Similar to the measures of overall job satisfaction, the 45—54 age group was more favourable than the 25—34 category towards nine determinants of OS1-2 [i.e. ~~RNs1&RNs1~~and 5, WE1, KACPs2-5; QLWCs3& and 5]. This implies 80-~~per-cent~~% of KACP factors were more favourably perceived by participants aged 45 to 54 years. In addition, there was a significant difference between the 45—54 and 35—44 categories towards RN5. Only three determinants were influenced by the educational background of participants (RNs 4 and 5, and LON1). When compared to holders of Bachelors' and post-graduate qualifications, workers who earned no more than high school qualifications were more favourable towards RNs 4 and 5, although they felt lonelier than participants who had earned at least one degree (LON1).

### **Conceptual model for future study**

~~Further studies will build on the achievements of this current study to determine the holistic effects of participants' demographics against overall job satisfaction and the independent variables using a suitable regression analysis~~

as illustrated in Figure 1. This will elicit evidence to assist policy makers as they develop strategic interventions regarding the enduring determinants of overall job satisfaction for a critical population of skilled immigrant construction workers in the NZCI. In such analyses, only OS1 and OS2 will be considered as dependent variables because of the relatively weaker correlations found between OS3 and the independent variables. For OS1 and OS2 in particular, it is appropriate to further explore the independent variables that showed strong or moderate correlations in Table 5. Thus, there will be 16 and 10 independent variables in total for OS1 and OS2 respectively, as shown in Figure 1a and 1b. Although five demographic variables were considered in the current study—gender, marital status, length of time spent in NZ, age and educational background—current findings show only age and educational background influenced OS1 and OS2. These two variables influenced some independent variables also. Therefore, age and educational background could be introduced as moderators in Figure 1.

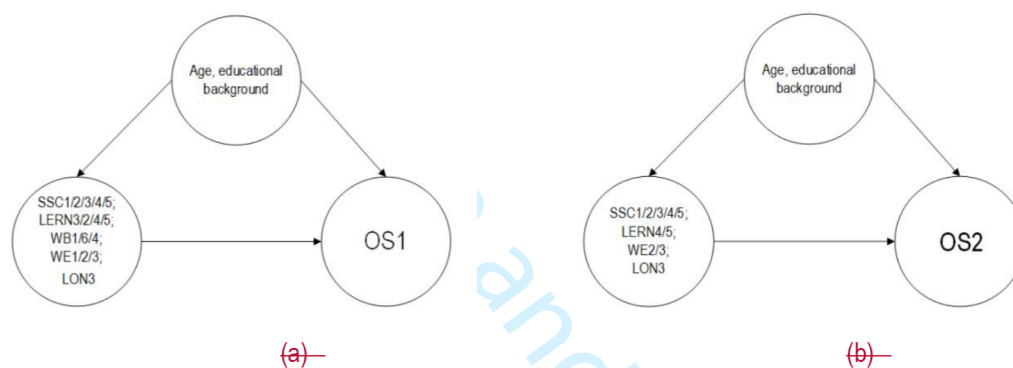


Figure 1: Conceptual framework for perception [regression] modelling of migrant construction workers' satisfaction in NZCI

Table 5: Favourability towards the determinants of overall satisfaction

Effect of:					Age [interpretation; statistical evidence]		Educational background [interpretation; statistical evidence]	
Factor	Rank*	Sample Mean ( $\mu_s$ )	Std. Deviation (Sample)	Population mean ( $\mu_p$ )	Interpretation	Supporting evidence [One-way ANOVA (p-value) followed by Tukey HSD (p-value)*]	Interpretation	Supporting evidence [One-way ANOVA (p-value) followed by Tukey HSD (p-value)*]
					(45-54) > (25-34)	$P_{ANOVA}=0.028$ ; $P_{Tukey}=0.05$		
RN1	6	3.75	1.128	3.90	No effect	$P_{ANOVA}=0.324$	No effect	$P_{ANOVA}=0.121$
RN2	18	4.16	0.879	4.30	No effect	$P_{ANOVA}=0.255$	No effect	$P_{ANOVA}=0.969$
RN3	20	3.44	1.574	3.70	No effect	$P_{ANOVA}=0.139$	No effect	$P_{ANOVA}=0.459$
RN4	15	3.64	1.531	3.90	No effect		Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	$P_{ANOVA}=0.003$ ; $P_{Tukey}=0.018$ for Bachelor versus Under High school $P_{Tukey}=0.018$ for Bachelor versus High school $P_{Tukey}=0.047$ for Postgrad versus Under High School $P_{Tukey}=0.039$ for postgrad< versus High School $P_{ANOVA}=0.622$
RN5	17	3.53	1.277	3.80	(45-54)>(25-34); (45-54)>(35-44)	$P_{ANOVA}=0.007$ ; $P_{Tukey}=0.046$ for (45-54)versus(25-34) $P_{Tukey}=0.030$ for (45-54)versus(35-44)	No effect	
RN6	13	3.59	1.596	3.80	No effect	$P_{ANOVA}=0.061$	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School	$P_{ANOVA}=0.000$ $P_{Tukey}=0.000$ for Bachelor versus Under High school $P_{Tukey}=0.014$ for Bachelor versus High school $P_{Tukey}=0.000$ for Postgrad versus Under High School $P_{Tukey}=0.001$ for postgrad< versus High School $P_{ANOVA}=0.789$
RN7	19	3.22	1.375	3.10	No effect	$P_{ANOVA}=0.136$	No effect	
RNavg	N/A**	3.69	1.024	3.82				
WE1	16	4.38	0.693	4.50	(45-54)>(25-34)	$P_{ANOVA}=0.002$ ; $P_{Tukey}=0.008$	No effect	$P_{ANOVA}=0.111$
WE2	8	4.35	0.769	4.40	No effect	$P_{ANOVA}=0.063$	No effect	$P_{ANOVA}=0.571$
WE3	11	4.06	0.973	4.00	No effect	$P_{ANOVA}=0.088$	No effect	$P_{ANOVA}=0.184$
WEavg	N/A	4.3	0.648	4.39				
KACP1	21	4.32	0.839	4.40	No effect	$P_{ANOVA}=0.187$	No effect	$P_{ANOVA}=0.399$
KACP2	14	4.15	0.930	4.00	(45-54)>(25-34)	$P_{ANOVA}=0.014$ ; $P_{Tukey}=0.024$	No effect	$P_{ANOVA}=0.339$
KACP3	12	4.25	0.875	4.40	(45-54)>(25-34)	$P_{ANOVA}=0.003$ ; $P_{Tukey}=0.047$	No effect	$P_{ANOVA}=0.414$
KACP4	5	4.26	0.883	4.40	(45-54)>(25-34)	$P_{ANOVA}=0.048$ ; $P_{Tukey}=0.034$	No effect	$P_{ANOVA}=0.381$
KACP5	7	4.24	0.935	4.40	(45-54)>(25-34)	$P_{ANOVA}=0.015$ ; $P_{Tukey}=0.05$	No effect	$P_{ANOVA}=0.340$
KACPavg	N/A	4.29	0.735	4.40				



QLWC1	10	4.09	1.006	4.00	No effect		$p_{ANOVA}=0.492$	No effect		$p_{ANOVA}=0.778$
QLWC2	3	4.18	1.014	4.30	No effect		$p_{ANOVA}=0.954$	No effect		$p_{ANOVA}=0.449$
QLWC3	1	4.11	0.937	4.00	(45-54)>(25-34)		$p_{ANOVA}=0.047$ ; $P_{Turkey}=0.002$	No effect		$p_{ANOVA}=0.063$
QLWC4	4	4.06	0.998	4.00	No effect		$p_{ANOVA}=0.100$	No effect		$p_{ANOVA}=0.765$
QLWC5	2	4.10	1.005	4.00	(45-54)>(25-34)		$p_{ANOVA}=0.038$ ; $P_{Turkey}=0.041$	No effect		$p_{ANOVA}=0.056$
QLWCavg	N/A	4.11	0.858	4.20						
LON1	=22	3.45	1.375	3.70	No effect		$p_{ANOVA}=0.275$	Bachelor< Under High school; Bachelor < High school; Postgrad< Under High School; postgrad< High School		$p_{ANOVA}=0.021$ $P_{Turkey}=0.024$ for Bachelor versus Under High school $P_{Turkey}=0.044$ for Bachelor versus High school $P_{Turkey}=0.028$ for Postgrad versus Under High School $P_{Turkey}=0.014$ for postgrad< versus High School
LON2	=22	3.17	1.432	3.00	No effect		$p_{ANOVA}=0.604$	No effect		$p_{ANOVA}=0.816$
LON3	9	4.01	1.088	4.00	No effect		$p_{ANOVA}=0.488$	No effect		$p_{ANOVA}=0.682$

## Discussion of the ~~findings~~ Findings

This research has highlighted the significance of migrants as a solution to addressing the skills shortages seen within the NZCI. The economic ~~significance~~ importance of the migrant construction workforce is acknowledged (MacLennan, 2018). However, ~~as~~ little is known about ~~how well~~ their ~~job aspirations are being met, nor working conditions, perceptions of~~ their ~~emotional status~~ work environments and ~~general well-being~~ the level of their goal achievements in their new environment (NZ). ~~It is important to~~, the current study finds its relevance. Yalabik, Rayton and Rapti (2017) had made a note ~~that of the importance of~~ job satisfaction ~~drives as a driver of~~ all dimensions of work engagement (~~Yalabik, Rayton & Rapti, 2017~~), which could positively impact on the productivity of the national workforce. The need to capitalise on the full potential of the migrant construction workforce cannot be overemphasised. In this study, we investigate Chinese migrant construction ~~workers'~~ workers satisfaction in relation to their overall job satisfaction in NZ. ~~The~~ Thus, the study provides insights into the moderating effect of migrants' demography on the determinants of job satisfaction within the NZCI.

~~To address the study objective, three~~ Three hypotheses were developed and tested ~~to address the study objective~~. The first hypothesis (H1) sought to establish how satisfied respondents were with their jobs overall. There was a general agreement of satisfaction between study participants, which indicated they would like to extend their stay and were most likely to recommend NZ as a good place to work. The first hypothesis (H1) was therefore accepted. This is new knowledge considering the ~~dearth of literature within the social science field on construction migrants in NZ~~ absence of literature within the social science field on construction migrants in NZ. The comparison of the population means indicated that Chinese construction workers were more favourable towards OS3 (willingness to continue work in New Zealand) with compared to OS1 (generally satisfied with work) and OS2 (New Zealand is a good place to work). Within this quantitative study, it was not possible to find 'why'. Potentially, this may be because OS1 and OS2 are more specific measures of 'work environment' whereas OS3 could be influenced by factors outside of work such as improved living conditions and better education for children with compared to the homeland. A qualitative investigation is required to find out these additional factors. Also, OS1 and OS3 showed only a moderately strong association ( $r=0.588$ ;  $p=0.000$ ). These substantiate that there are factors outside of work that influence willingness to live in New Zealand.

The second hypothesis (H2) focused on the moderating effect of the demography of Chinese construction migrants on job satisfaction. ~~The~~ Although the literature review showed inequality issues and discrimination worldwide against women in the construction industry, the study found that the overall job satisfaction expressed by the study participants was irrespective of their gender, ~~marital status and the length of their stay in NZ~~. In terms of age, the study revealed that participants within the 45–54 age group were generally. This could be because the New Zealand government and construction industry stakeholders have a significant and shared commitment to ensure gender equality and diversity (Construction Sector Accord 2020). Nevertheless, equal satisfaction cannot be considered valid for other women populations – such as New Zealanders and pacific islanders – as their cultural and social constructs may be significantly different from Chinese women. The study also showed that the length

of stay in NZ did not determine job satisfaction significantly. Thus, it could be expected that it is easy to become adapted to New Zealand work environments. As shown in Table 5, the average population mean for the WE factors is 4.39, indicating favourable construction work environments in New Zealand.

The literature review showed that marital status could influence job satisfaction in migrant workers; nevertheless, both married and unmarried Chinese migrant workers are equally favourable towards overall job satisfaction. According to literature (Mohsin et al., 2019), the effect of marital status gets diminished when the host government is committed towards migrant workers' wellbeing via commitment to international protocols and local legislations. Nevertheless, the current study's methodological position is inadequate to explain this equal favourability credibly. Firstly, the current study did not evaluate if the married migrant workers left their families behind or moved with them. Secondly, there is a future study requirement to assess how New Zealand work environments and living conditions help migrant workers cope with depressive symptoms when leaving their families behind.

However, in terms of age, the study revealed that participants within the 45–54 age group were happier than those in other age groups and would recommend NZ to others as a good country in which to work. It should be noted that the above 55 group was not considered under this analysis. Compared to younger migrant workers, middle-aged workers typically have added family commitments such as supporting children's education and looking after aged parents. Coupled with favourable income levels (see Table 5), an ability to fulfil these commitments could enhance job satisfaction in this age category. Also, the middle-aged workers have more positive reaction towards job stability when compared to younger generations that prioritise travelling, leisure and adventures. Thus, the field study findings are consistent with the reviewed literature.

Another important demographic was educational background; the study found that participants with high school qualifications (and below) were more likely to recommend NZ as a country in which to work. This finding is consistent with Gonzales, Sanchez & Lopez-Guzman (2016) that workers with lower educational levels are more likely to express higher levels of appreciation for work that they have been able to secure and maintain. Our study did not investigate the Chinese migrants' previous employment (or employability) status in their home country, which may be significant to their responses to job satisfaction in their new environment.

Finally, the last hypothesis (H3) tested the moderating effect of the demographic status of migrant Chinese construction workers on the determinants of job satisfaction. Our findings indicate that age and educational backgrounds had significant influence on some of the determinants of overall job satisfaction. Older migrants (45–54 years) tended to be more favourable to the determinants of overall satisfaction. In contrast, participants' educational backgrounds influenced only three determinants (RNs 4 and 5, and LON1) were influenced by the educational background of participants. Furthermore, migrants with lower qualifications were more favourable towards RNs 4 and 5, although they felt lonelier than participants who had earned at least one degree (LON1).

Considering that age and educational background significantly influenced both independent and dependent variables, a correlation analysis will be inappropriate to test the hypothesis in future. That 'RN/WE/KACP/QLWC/

*LON influences Chinese migrant worker's job satisfaction in the New Zealand Construction industry'. Thus, a regression analysis could be employed to test this hypothesis while introducing age and educational background as moderating variables. The challenge is that these two moderating variables are categorical; compared to continuous and dichotomous variables, they need specific attention before regression. Thus, the authors suggest re-coding these categorical variables using an appropriate coding system (see Institute for Digital Research and Education, 2021). The outcomes could elicit evidence to assist policymakers in developing strategic interventions regarding the enduring determinants of overall job satisfaction for a critical population of skilled immigrant construction workers in the NZCI.*

## Conclusion

This study aimed to establish the moderating effect that demography has on the overall job satisfaction of Chinese migrant workers in the NZCI. It is an aspect of a *larger more extensive* study on the *well-being working conditions* of migrant construction workers in NZ. The study identified gender, age, educational background, marital status and years of experience as personal characteristics that may influence migrants' perception of satisfaction within their host country, NZ. The *results of the current study results* support the internal validity and reliability of these personal characteristics as moderators of job satisfaction *for this category of migrant construction workers. Migrant Chinese construction workers over 45 years old were more satisfied with working conditions than younger migrants. Also, the educational background of these migrants (especially those less educated) was significant to overall perception of satisfaction. Both age and educational background were confirmed as moderators to the determinants of their job satisfaction within the NZCI. These findings are significant to future efforts by government and policymakers to address the perceived exploitations reported in the NZ media. Also, the findings may contribute to policy initiatives on the optimal categories of migrants engaged on construction activities to derive the maximum benefits for NZ. Finally, the study provides insights for organisations employing migrants about putting in place appropriate measures to enhance their satisfaction levels.*

*Similar empirical findings can contribute to improving living conditions and the overall achievement of expectations of life in the NZCI. It provides an alternative perspective to the immigration survey monitoring programme in New Zealand, because of its focus on a particular ethnic nationality that makes up a significant percentage of the migrant workforce. Further studies will build on the achievements of this current study to determine the holistic effects of participants' demographics against overall job satisfaction and the independent variables using a suitable regression analysis. This will elicit evidence to assist policymakers in developing strategic interventions regarding the enduring determinants of overall job satisfaction for a critical population of skilled immigrant construction workers in the NZCI.*

There are limitations to the study findings. Firstly, the sample consists exclusively of Chinese construction migrant workers in Auckland city, NZ. *The Therefore, the* generalisation of these research results to other migrant worker groups *in other areas*, should *therefore* be made with caution. Despite this limitation, the current study provides a meaningful beginning to *the exploration of exploring* a largely-ignored population in the NZ workforce. More studies



are needed to focus on construction migrant workers from other cultural backgrounds. The second construct we measured in the current study was general job satisfaction. Therefore, findings in the ~~current~~present study should not be generalised to other, more specific aspects of job satisfaction. As mentioned previously, job satisfaction is a broad and multi-faceted construct. Migrant workers' job satisfaction toward ~~factors such as~~ pay, management, and skill variety, might have different predictors ~~which that~~ need to be explored in more detail in future studies. Overall, the current study is encouraging, and fills the gap in the literature regarding construction migrant workers' job satisfaction in NZ. More studies are needed in this field to explore the antecedent and consequent effects of these key elements. In the future, involving other construction migrant worker groups and even local-born workers could extend the current study, as would the ~~extension of the~~ coverage area extension to other cities or locations in NZ.

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# Manuscript ID ECAM-05-2021-0457 Migrant construction workers' demography and job satisfaction: A New Zealand study

	Reviewers' Comments	Authors' Responses
	<b>Editor</b>	
1	Establish a clear motivation for needing to study satisfaction of migrant workers	This concern has been clearly addressed in the background, lit rev and discussion section
2	Expand the literature review to set up the choice of variables in the questionnaire,	The literature review section has been significantly revised to include an explanation of the different variables contained in the questionnaire
3	Explain the proposed conceptual framework	The conceptual framework for the current and future research investigation are now explained for clarity. The manuscript has been re-arranged accordingly to distinguish the current framework from those proposed in future studies.
4	Relate the contribution to other literature on migrant workers	The contribution of the study has now been made clearer through extensive additions to the Discussion and Conclusion sections. Please see authors responses to the reviewers' comments for reference.
	<b>Reviewer 1</b>	
1	In Introduction at first paragraph, please either use words for numbers such as "eight per cent" or numbers like "6.60 per cent". The paragraph itself is already a bit complicated, being consistent will make it easier to read.	The manuscript has been revised extensively, taking care of all errors, omissions, syntax issues. It has been professionally proofread to address reviewers' concerns.
2	Citation style looks wrong in Introduction 3rd paragraph. For example (Dainty, Ison & Briscoe, 2005) should be (Dainty et al., 2005). Also citation style is not consistent, for example at page 3, line 3-4 (see Macky and Boxall, 2008) while previously & is used instead of "and". Please check all the citations carefully and make sure to match them to journal style	
3	In the Introduction, it is not clear why studying "what moderates job satisfaction of migrant workers" is important. The authors indicate that there is a gap of such studies, however, why does such a gap exist? Why is it important to study job satisfaction and particularly the job satisfaction of migrant workers? Is it expected to be different compared to local workers? What will job (dis)satisfaction lead to? The authors need to answer such questions to motivate the contribution of the paper better. Moreover, from the introduction, it seems like the authors assume job satisfaction and well-being are similar concepts. Assumed relation between these two concepts should be explained in a sentence or two.	The introduction section has been revised to include information that gives clarity to the need for research on migrant construction workers and in particular Chinese temporary work visa holders. This justification is made apparent in the research methods section too.  All references to well-being have been moderated within the manuscript to remove any confusion with the main focus of the current study on job satisfaction.
4	There are some errors with the software I assume, for example see page 6, line 35, "Error! Reference source not found.". This happens when the system converts the word file to pdf during submission, make sure references are fine in the pdf.	
		The manuscript has been revised extensively, taking care of all errors, omissions, syntax issues. It has been professionally proofread to address reviewers' concerns.



5	In page 6, line 37, the correct wording for the scale is, "A 5 point Likert scale", not 1-5.	
6	The title "Conceptual model" is misleading, because there is not a model but instead a description of which variables are used and how are they found. Last paragraph about why Chinese citizens were selected is interesting but this should be moved to the Research method.	
7	In Research method, can you please give a rough number of "how many immigrant construction workers are there in NZ?". This would help us to understand whether the initial sample of 200 was fine or not.	Thanks for the observation. The actual number of migrant Chinese construction workers on temporary work visa is currently unavailable. However, we have provided an indication that in 2019 there were 22,192 Chinese on temporary work visa for the whole country. So we do not know how many of these work in the construction industry.
8	Page 7, line 55, do you mean for all inferential statistical tests, you used $p \leq 0.05$ as threshold?	Thank you. To add clarity, the sentence has been reworded as "For all inferential statistical tests, the threshold was set as $p \leq 0.05$ "
9	In Research method, there is no explanation of how the questionnaire was developed. Did you use questions from previous examples? Did you do a literature review? (There is an indication of that in Conceptual model, which should actually go under Research method where questionnaire development is explained. However you need to give details of the literature review. Now I have no clue where did you find those 23 factors from).	Thanks for the observation. The research method section has been revised to explain that the questionnaire for this study was developed from review of relevant literature on the measures of job satisfaction. In the literature review section, all the measures used in the questionnaire were discussed on the basis of their relevance to general workers satisfaction.
10	In Research method, the authors did not explain how the questionnaire was distributed. Was it online or postal? How many reminders were there if any etc.	Thanks for the observation. A paragraph has been provided to explain how the questionnaire was developed and distributed and this is done within the research methodology section. The methodology section has been revised to justify the use of purposive sampling.
11	Can you please report the p values or correlations? Now only r values are reported.	Thank you. P values are added in the table and in the text.
12	Please add "Results" or "Findings" as a section to the paper and introduce "Overall job satisfaction" etc under it as subheadings.	Thank you. A section entitled 'Results' has been introduced, and the findings are sorted under sub-headings.
13	Conceptual model for future study looks irrelevant for the current paper. There is no theoretical reasoning supporting the findings that will lead to a new model being tested. It looks very simple at its current form. Besides, anyone reading the results of the study should get these conclusions which is not required to be repeated in a new subheading. The authors can however summarize this paragraph and add as Future research or recommendations in the next section.	The conceptual model for future study is removed. The current study's conceptual model is explained after the explanation of the hypotheses H1-3. Under discussion, the future study directions are explained.
14	The discussion lacks discussion, it is more of a summary of results. For example, in page 12, line 7, the authors describe that older migrants are in more favor to the determinants of overall satisfaction, how can this be explained further?	Discussion is expanded to address this issue.
15	Similar to the discussion, conclusions lack conclusions. The purpose is given together with an abstract sentence indicating some determinants "may" influence. In conclusions, more concrete sentences in form of conclusions are expected. A large part of the conclusions is limitations.	The Conclusion section has been revised to address these shortcomings.
16	Can you add "construction workers" and "migrant workers" as a keyword or a similar keyword indicating it.	Done, list of keywords revised.



17	The paper contains new information including how satisfied migrant workers are in NZ and what influences their satisfaction. But this is not enough since a large part of the paper remains very abstract and the authors need to motivate further why such a study is important, for example why is it important to increase job satisfaction of migrant workers?	The introduction section has been revised to include information that gives clarity to the need for research on migrant construction workers and in particular Chinese temporary work visa holders. This justification is made apparent in the research methods section too.
18	The authors structure the part about literature very well but for a quantitative paper, the literature review is insufficient and not well reported. It is unclear how the questionnaire is developed, which references supported the 23 variable used in the questionnaire. Moreover, the authors could benefit from studies from other fields/countries where migrant workers are used commonly. These kind of papers could bring depth and richness to the discussion.	A review section on general measures of job satisfaction has been added. All the variables measured in the questionnaire were discussed on the basis of their relevance to general workers satisfaction and migrant workers, leading to how they have been constructed into the variables that were measured in the study.
19	The authors need to add more explanations in the Research method section, especially motivating the 200 workers as a fine sample and how the questionnaire is developed and distributed.	Thank you. This section has now been revised to address these concerns
20	I suggest that the authors start a "Results" section where results are presented under this section. Otherwise the tests are presented and explained very well.	Thank you. A section entitled 'Results' has been introduced, and the findings are sorted under sub-headings.
21	Since the paper is lacking a motivation of why is it important to study migrant workers satisfaction in NZ construction industry, it is difficult to see how the research and practical contributions will be. With local workers, it is clear why employees would like to keep them satisfied (e.g. to reduce turnover of employees and recruitment costs). However, the paper does not explain why employees should invest on making migrant workers satisfied.	The paper has addressed these concerns extensively in the Introduction, literature review and discussion sections. The rationale for the study is now more apparent and the implications of the study findings.
22	There are many small errors with the language used in the paper. So I recommend authors to use proof reading services before revising the paper.	The manuscript has been revised extensively, taking care of all errors, omissions, syntax issues. It has been professionally proofread to address reviewers' concerns.
<b>Reviewer 2</b>		
1	I was expecting some directions on how the job satisfaction for a person working in a different country would be different from a person working in their own country. This aspect was not touched in particular and the study goes back to the same dimensions of job satisfaction as previous studies. The authors have to distinguish their study in this direction. The key question is what is the new finding with respect to migrant workers' job satisfaction as compared to normal workers. I look forward to this contribution being highlighted.	The introduction section has been revised to include information that gives clarity to the need for research on migrant construction workers and in particular Chinese temporary work visa holders. This justification is made apparent in the research methods section too.
2	However, the key themes of job satisfaction and strands of the research directions have to be highlighted. What are the major theories related to job satisfaction. e.g. Will job satisfaction determined by incentives or state of living or the team with which they work etc. The authors might do well to get the key themes of literature in this direction and position the current study among the literature. Also, for the key variables as mentioned in Table 1, the authors may have to get literature support.	Thank you, all of the issues raised have been addressed in the literature review section with newer aspects to explain the measures for overall job satisfaction thereby underpinning the key variables mentioned in Table 1.

3	First, The H3 (page 7 line 11) seems to be too long and contain a lot of dimensions for a hypothesis. While the alternate hypothesis for H1 and H2 are evident, the H3 can a number of alternate hypothesis. The authors should try to refine this hypothesis and also give a justification of these hypothesis.	Thank you. H3 is modified and a justification has been added.
4	Second, the authors should explain how the hypothesized population mean is arrived at in page 8. How is mean set at 4.2. Are there precedents which establish this as a standard method. The authors should justify their choice of population mean.	Thank you. The procedure is explained now.
5	Third, in page 7, the authors should explain further how normality of the data is established. For example, the authors indicate in page 7 that "Findings show the central tendencies were close to each other and kurtosis and skewness were between $\pm 1$ after the removal of outliers". What do the authors mean that the measure are close to each other? How close is close enough? How did that authors decide on 1 as a good measure for kurtosis and skewness. They should indicate this. I would also suggest that the authors to perform standard normality test employed in statistics to this effect.	It is now explained in the result section that the data distributions are not 'precisely' normal (according to a series of Shapiro-Wilk (SW) test). Since the non-parametric alternatives have limitations and accuracy issues, the authors checked if the data distributions were 'approximately' normal so that mean and standard deviation (as opposed to median) could be used to test population central tendencies. To justify this, references (Cantor and Shuster 1992; Razali and Wah 2011; Smith 2012; Kwak and Kim 2017; Matulová and Rejentová 2021) are added. As a graphical test, Q-Q plots were checked; it is explained that there was no significant deviation between the snake like data distributions and straight lines (thus, approximately normal). Since graphical observations could be overly subjective, kurtosis and skewness were checked as additional means. Kurtosis and skewness were between $\pm 1$ for the data distributions, which is an indication of approximate normality (Razali and Wah 2011).
6	Fourth, for the gender based test, do the authors feel having 9 females compared 98 males in the sample is good enough to make any conclusions?	Thank you. The sample distribution could be considered as a general representation of gender imbalance in the construction industry. However, the low sample for female could influence the accuracy of the independent sample t-test because of compromising the central limit theory; therefore, we have added non-parametric, independent sample 'median' test a secondary means to verify the conclusions.
7	The authors should address the concerns I raised earlier regarding the novel contribution of this study towards understanding the job satisfaction when working in a different country. What new did we learn from this sector. How are migrant construction worker job satisfaction theories different from general job satisfaction theories in management literature. The authors should establish these implications from the study.	The literature review section has been significant revised to justify the rationale for the current study investigation. Also, the Discussion section now has provided more explanations on the implications of the study (and its novelty).
8	The results of the statistical analysis are generally well presented. Some concerns here about the conceptual framework. The conceptual framework illustrated in the study does not highlight the key terms shown in the figure. What does all those terms mean, what do the arrows mean. The authors should explain the framework in a detailed manner and how it was established from literature.	To address other reviewer's comments, the conceptual model for future study is removed. The current study's conceptual model is added after the explanation of the hypotheses H1-3. Arrows are explained with the use of hypotheses. Justification is added for the hypotheses.
9	There are few things the authors should take care. One minor thing - I observed, "Error! Reference source not found" no a number of pages. This should be rectified. Also a general spell and grammar check may be useful and could be done by authors.	The manuscript has been revised extensively, taking care of all errors, omissions, syntax issues. It has been professionally proofread to address reviewers' concerns.

	<b>Reviewer 3</b>	
1	<ul style="list-style-type: none"><li>- Page 4 Line 10: "explain" should be "explained"</li><li>- Page 6 Line 36: Need to add the reference.</li><li>- Page 7 Line 41: Need to add the reference.</li><li>- Page 9 Line 8: Need to delete "INSERT".</li><li>- Page 10 Line 23: Need to add the reference.</li><li>- Page 10 Line 58: Need to add the reference.</li></ul>	The manuscript has been revised extensively, taking care of all errors, omissions, syntax issues. It has been professionally proofread to address reviewers' concerns.