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Macroergonomic Interventions for COVID-19 Moderated Job Dissatisfaction among Field Technicians

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Abstract. A trading company encountered a high turn-over rate of 24% during a five-month period. The aim of this study is to propose macroergonomic interventions for the company to possibly mitigate factors driving job dissatisfaction among field technicians (FTs). Exit interviews conducted among the resigned FTs showed work environment, workload, and job alternatives as to the main drivers of job dissatisfaction. Subsequent in-depth interviews of a sample of ten (10) from the current crop of FTs provided additional insights on job satisfaction and turnover intention, amidst the COVID-19 pandemic. Resigned FTs cited unfavorable work environments, work overload, and attractive job alternatives as reasons for their resignations. In-depth interviews for current FTs revealed general trends of high job satisfaction and weak turn-over intention despite the challenges and difficulties brought by the COVID-19 Pandemic. Macroergonomic interventions were recommended for the review and re-design of FT systems related to field activities amidst the COVID-19 pandemic, the incentive scheme, the reporting system, and the onboarding process.

Keywords: component, COVID-19, job dissatisfaction, turn-over intention, macro-ergonomic interventions, Field technicians

1. Introduction

1.1. The covid pandemic

COVID-19 and the restrictive measures towards containing the spread of its infections have seriously affected the agricultural workforce and jeopardized food security [1]. Social distancing, self-isolation and travel restrictions have led to a reduced workforce across all economic sectors and caused many jobs to be lost [2]. As in the case of frontline Egyptian physicians, increased fear levels relating to COVID-19 have a relationship with lower levels of job satisfaction and higher levels of job turnover [3]. Because of its direct link to food production in the Philippines, the agriculture industry was one among the few which remained operational throughout the pandemic. Smallholder farmers continued to plant their traditional crops. Business organizations engaged in the distribution of crop inputs like seeds, fertilizers, and crop protection products continued to engage small holder farmers through agronomists or field technicians (FTs).

1.2. Field technicans (FT)

A typical FT is educated in agriculture, speaks the local dialect, and rides a motorcycle to conduct field promotional activities such as crop demonstration trials and farmer meetings. Upon hiring, FTs undergo the requisite product training on top of the usual corporate orientation program. Based on the nature of the business and the products being promoted, FTs are assigned individual territories or areas after the usual product training. Ideally, FT's need to stay long enough in the job and in the area of assignment so they can develop the expertise and confidence in providing sound advice to farmers while sustaining market demand

for the products of their corporate employers. Considered as front-liners, FTs play crucial role to the business of their employer, the crop input suppliers. Thus, it is important that FTs are kept engaged and motivated so they can continue to perform their highly specialized brand of service to both farmers and their employers.

One such employer is a trading company, which is engaged in the development and distribution of vegetable seeds. To cater to the needs of the vegetable farmers while sustaining demand for its products, the company deploys a total of fifty (50) FTs throughout the Philippines. Between a five-month period in 2021, a total of twelve (12) FTs resigned, representing an alarming rate of 24% turn-over rate for the aforementioned five-month period. Worse, the process of hiring and training may be a bit complicated given the current restrictions for Covid19.

The hiring and retention of high-performing FTs represent challenges for business organizations like the company. They need to understand and analyze the reasons for such high turn-over rate. More importantly, organizations need to find a way to retain whatever is left of its high performing FTs. An option for the company is to study the factors influencing job satisfaction of its remaining FTs.

In most business organizations, FTs are part of the sales team. Sales force turnover is defined as the rate at which salespeople leave an organization because of separations such as promotions, resignations, retirements, or dismissals [4]. Sales force turnover is a heterogeneous phenomenon that is costly and impossible to manage effectively without understanding its mechanisms [5]. Turnover involves high direct and opportunity costs, often hidden or felt in the long run, and difficult to estimate [6].

1.3. Element of novelty in the study

In one of the few studies making reference to turn-over intention of FTs in the agriculture industry, Mulinge (2000) merely investigated cross-sector differences in job satisfaction among agricultural technicians in Kenya [7]. By the nature of their activities, FTs are akin to agricultural extension workers from the academe and the government sector, mainly servicing small holder farmers. FTs can likewise be compared to salespeople as they try to "sell" technology to the farmers and the retail outlets. These very narrow description of the FT's function makes it difficult to perform some direct cross-referencing to possible similar jobs in other countries. Because of these reasons, the choice of field technicians of crop input suppliers in the Philippine setting during the Covid pandemic provides the novelty element of this research study.

1.4. Purpose of the study

The aim of this study is to understand what drove the high turn-over rate and propose macroergonomic interventions for the company to possibly mitigate factors driving job dissatisfaction among field technicians.

1.5. Job dissatisfaction and turn-over intention

Several studies have investigated the link between job satisfaction and turn-over. Lee (1988) investigated how job dissatisfaction leads to employee turnover [8]. Shukla (2013) concluded that intrinsic and extrinsic job satisfaction, are negatively and significantly associated with turn-over intention [9]. Vizano (2020) found out that work satisfaction has a negative effect. and significantly on turn over intention [10]. Aydogdu (2011) confirmed that turnover intention has a significant and negative relationship with job satisfaction [11]. Rahman (2020) concluded that job satisfaction increases loyalty and professional commitment to the organization which leads to productivity [12].

1.6. Work environment

Work environment has been studied as a key factor to retain employees. A good and health work environment will lead to the less employee turnover intentions [13]. Perceived Supervisor Support (PSS) leads to Perceived Organizational Support (POS), which in turn, reduces turnover by strengthening felt obligation toward the organization and affective organizational commitment. [14]. POS can be associated with higher levels of organizational commitment which in turn results in lower turnover intentions. [15]. When investigating the causal relationships between working environment and labour turnover, a significant (p<0.001) association was revealed only with the later. It seems that working environment influence the labour turn over [16].

1.7. Work load

Another major factor is workload which is positively related to the employee turnover intentions. A rational workload is win-win situation for the organization, study provide the empirical evidence that employee thinks to leave the job when they are over burden. [13].

1.8. Perceived alternative jobs

A third factor, perceived alternative job opportunities were likewise linked with turn-over, Albalawi (2019) concluded that perceived alternative job opportunities can be associated with lower levels of organizational commitment which in turn results in higher turnover intentions [15]. Niyas (2018) noted that better employment opportunities are highly influencing factors on labor turn over and the relationship between the management and employees is only a significant negative influence on labor turn over [16].

1.9. Applicability of macroeregonomics

Macroergonomics finds application in this study as it is the branch of ergonomics that is a large system approach emphasizing integration and organizational design [17]. This study can contribute to a better understanding of how job dissatisfaction can lead to turn-over as applied to the situation of Company A. If warranted, macro-ergonomic interventions can address problems associated with work environment, work load and perceived job alternatives. Guimarães (2014) studied macroergonomic interventions in a Brazilian footwear company. The study used a participatory, socio technical approach of the Macroergonomic Work Analysis. The relevant steps included appraisal and diagnosis, idea generation, prototyping and testing, proposal of solutions, and implementation and evaluation (23).

2. Methodology

2.1. Procedure

This study was qualitative in nature as it focused on understanding Covid-moderated job dissatisfaction among field technicians for purposes of proposing macro-ergonomic interventions. A research framework was developed based from exit interviews of the resigned FTs. To further assess the present situation and in consideration of the time available to complete the study, the researcher opted for in-depth interviews of a non-random purposeful sample of ten (10) FTs from the current crop of Company A's FTs. The findings in the exit interviews and the results of these in-depth interviews became the bases for the proposed macro-ergonomic interventions to possibly mitigate job dissatisfaction which is likely to lead to turn-over intention.

In as much as the researcher wanted to replicate the exhaustive approach by Guimarães (2014), the proposed macroergonomic interventions shall be limited to appraisal and diagnosis, and proposal of solution, given time constraints.

2.2. Research structure

The research model was developed using secondary data and similar studies. Secondary data from exit interviews of the resigned twelve (12) FTs revealed that work load, work environment and perceived job alternatives were among the common reasons for the FT resignations. These findings from the exit interviews are summarized below in Table 1.

FT Count	Main Reasons for Resignation	Construct
6	Too much tasks assigned; late time to eat due to urgent matters; multiple and overloaded task; tired; health concerns due to work load; too tired; all tasks are urgent	Work Overload
5	Long travel time from work to hometown; slow internal processes; no one listens to my concern; distance of area of assignment; no	Work Environment

Table 1: Reasons for ft resignations.

	guidance from supervisor	
1	Higher salary offer from other companies	Perceived job alternatives

Two past studies provided good reference for the development of the study model. Qureshi (2013) studied the effect of job stressor, work overload, and work environment on turn-over intention. Albalawi (2019) was among the first to show the mediating mechanism of organizational commitment on the link between perceived organizational support, perceived alternative job opportunity and turnover intention. Combining the Quesrishi and Albalawi model, with consideration to the aforementioned exit interview results, the research framework was developed as shown in Figure 1 below.

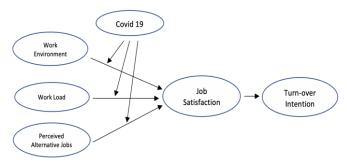


Fig. 1. Research study framework.

2.3. Questionnaire design

Two past studies provided good reference in the development of the in-depth interview questionnaire. Ahmad (2020) developed and validated a job satisfaction questionnaire for healthworkers which provided good questions for the Work Environment and Workload constructs. Albalawi (2019) studied a moderated-mediated model and helped formulate questions for the Perceived Job Alternatives, Job Satisfaction and Turn-over Intention constructs. Questions related to the construct work load in relation to quality time with the family and the impact of Covid are new questions formulated by the researcher as presented in Table 2 below.

Table 2: Questionnaire design

Construct	Code	Statement	Reference
	WE1	It is clear to me what my supervisor expects of me regarding my job performance	Ahmad (2020)
Work Environment	WE2	My supervisor is able to address my questions or concerns	Ahmad (2020)
	WE3	My supervisor clearly communicates his/her expectations of my job performance.	Ahmad (2020)
	WL1	I am satisfied with my total working hours	Ahmad (2020)
Work Load	WL2	The amount of work expected of me is reasonable.	Ahmad (2020)
	WL3	I feel that my workload affects quality time with my family	new
Perceived	AJ1	If I resign, chances that I would be able to find a good or better job is low	Albalawi (2019)
Job Alternatives	AJ2	It would not be easy to find acceptable alternative job	Albalawi (2019)
	AJ3	If I had to leave this job, I may not have another job as	Albalawi (2019)

		good as this one within a little	
		time	
	Co1	Covid worsened my work	2011
	Coi	environment	new
	Co2	Covid increased my work	naw
Covid		load.	new
Impact	Co3	Covid made me look for job	naw
		alternatives	new
	Co4	Covid made me less satisfied	naw
		with my job	new
	JS1	I feel fairly well satisfied with	Albalawi
		my job	(2019)
Job	JS2	I find real enjoyment in my	Albalawi
Satisfaction		job	(2019)
	JS3	Most days, I am enthusiastic	Albalawi
		about my job	(2019)
	TO1	I do not think of quitting this	Albalawi
		job	(2019)
Turnover	TO2	I would not likely search for	Albalawi
Intention		another job	(2019)
	TO3	It is not likely that I will leave	Albalawi
		this job the next year	(2019)

3. Results

3.1. Demographics of respondent FTs

A non-random representative sample of ten (10) active FTs were interviewed. Profile of these respondents are summarized in Table 3 below.

Civil Area of FT# Tenure Age assignment Status 1 23 Single 4 months Luzon 2 26 3 months Single Luzon 3 30 Single Luzon 3 months 4 35 3 months Single Luzon 5 44 Married Luzon 1 year 6 24 4 months Single Luzon 7 31 Married Visayas 4 years 8 31 Married Visayas 3 years 9 30 Single Mindanao 2 years 10 29 Married Mindanao 2 years

Table 3: Demographics of FT respondents

3.2. In-depth interview results

Table 4 below summarizes the in-depth interviews conducted on the ten (10) FTs. Respondents rated each statement based on a five-point Likert scale, where 1=Strongly Agree, 2=Agree, 3=Uncertain, 4=Disagree, and 5=Strongly Disagree.

Table 4: In-depth interview results

Construct	Code	FT Number									
Construct	Code	1	2	3	4	5	6	7	8	9	10
Work Environment	WE1	3	1	2	1	2	2	1	2	1	2
	WE2	1	1	2	1	2	2	1	2	1	2
	WE3	1	1	1	1	2	2	1	1	1	2
Work Load	WL1	1	1	2	1	2	2	2	1	1	2
	WL2	2	1	2	2	2	3	2	2	2	2
	WL3	3	1	4	2	2	4	2	1	1	2

Perceived	AJ1	1	4	2	2	2	2	3	3	3	2
Job	AJ2	1	5	2	2	2	2	2	2	4	2
Alternatives	AJ3	1	2	2	2	2	3	1	2	4	4
	Co1	1	2	1	2	2	1	1	1	2	1
Covid	Co2	1	2	1	3	4	2	2	1	2	1
Impact	Co3	5	4	4	4	4	3	4	4	5	5
	Co4	1	4	2	2	4	2	5	1	4	5
т 1	JS1	1	1	1	2	1	3	1	2	1	1
Job Satisfaction	JS2	1	1	2	2	1	2	1	1	1	1
Satisfaction	JS3	1	1	2	2	1	2	1	2	1	1
T	TO1	5	5	5	5	4	4	5	5	5	5
Turnover Intention	TO2	5	5	5	5	5	4	5	4	5	5
	TO3	5	5	5	5	5	4	5	4	5	5

3.3. Relevant comments from active FTs

In addition to the ratings provided by the respondent FTs in Table 4, additional valuable comments were secured. Some FTs chose to qualify and explain further their ratings to some of the questions posed. A summary of these additional comments in relation to the relevant constructs were noted and summarized in Table 5 below.

Table 5: Additional comments from respondent FTs

FT #	Code	Additional Comments					
	WE1	No face-to-face meeting yet with supervisor					
	WL2	happy with my job					
	WL3	need to work even on Sundays to finish tasks;					
	AJ1	need swab tests for job application					
	AJI	particularly if unvaccinated;					
1		Frequent postponement of scheduled					
1	Co1	activities; Barangay Captain strictly					
		implementing quarantine protocols					
	Co2	Postponed activites need to be rescheduled					
	Co3	Difficult to find job now during pandemic					
	Co4	Covid is different, cannot help farmer even if					
		willing to help					
	AJ1	Easy, because I have many friends in the					
2		industry (same as AJ2)					
	AJ3	Agree, many lost jobs this pandemic, may					
		take time					
	WL3	Area of assignment far from home, thus					
	W E3	cannot visit my parents as much as I want to					
3	AJ1	difficult to find job even if you have work experience					
	Col	Farmers themselves are scared of Covid					
		Difficult to find work now, so I will not leave					
	Co3	my present job					
	AJ1	Difficult now with pandemic (same for AJ2,					
4		AJ3)					
	Co4	cannot go out now with pandemic					
	AJ1	Agree, difficult these days (same for AJ2,					
5		AJ3)					
	Co2	disagree as my work load were reduced due					
	WL3	to the Covid restrictions Ovality time with family slightly affected					
6	Co2	Quality time with family slightly affected Mobility is limited					
	WL3	not necessarily					
7	AJ1	•					
'		uncertain given the abnormal times					
	AJ3	difficult to find new job specially during the					

		pandemic
	Co2	1, strongly agree, before it is easy to invite, farmers for the activities; now very difficult, there is added work just to talk with farmers given strict border protocols
8	Co3	4 disagree, looks like difficult to consider another job due to the uncertainties during the pandemic
	Co4	strongly agree, I am not satisfied due to the difficulties caused by the pandemic; cannot serve farmers
·	AJ3	May not be difficult as I think I can get a job
9	Co4	Because of Covid, I learned to love my job
		more

4. Discussion

The purpose of this qualitative study is to formulate macro-ergonomic interventions to possibly mitigate the alarming trend of turn-overs among the FTs. Specifically, findings in this study will be used for appraisal and diagnosis, idea generation, and proposal of solutions.

Macro-ergonomics emphasizes integration and organizational design. Logically, understanding what drove these resignations and confirming turn-over intentions and the factors driving such intentions should form part of these proposed interventions.

4.1. Exit interview results of (12) resigned FTs

From the exit interviews (Table 1) of the twelve (12) resigned FTs, work load (6), work environment (5) and perceived job alternatives (1) were listed as the main reasons. In effect, these were deduced as sources of job dissatisfaction which drove the spate of resignations. These findings remain consistent with past studies mentioned in the previous sections. Work overload, unfavorable work environment, attractiveness of perceived job alternatives and job dissatisfaction all lead to high turn-over intention.

4.2. In-depth interviews of (10) active FTs

Deciding on work load, work environment, perceived job alternatives, job satisfaction and turn-over intention as constructs, the possible impact of Covid on these turn-over drivers was added in investigating the turn-over intentions of active FTs.

The interview results from Table 4 show a general trend of high job satisfaction and low turn-over intentions among the respondents. With a few exceptions, results also showed similar trends of favorable work environment, reasonable work load and unattractive job alternatives. As to the impact of the Covid pandemic, the respondents generally agreed to a worse work environment, an increased work load and a weak intention to leave their current job. Interestingly, the respondents were divided as to the impact of the pandemic on job satisfaction.

4.3. Relevant comments from active FTs

Equally important are the relevant comments generated from the active FTs, which they shared in addition to their ratings. Focusing on the exceptions to the general trends noted in the quantitative ratings, the following represent interesting insights which should be considered carefully in crafting proposed solutions:

4.3.1. As to work environment

FT#1 lamented the fact that he has yet to have a face-to-face meeting with his supervisor. While this reflects on availability of the supervisor to guide his FT, this can also be attributed to the relatively short tenure of FT #1 (only 4 months) coupled with the travel restrictions due to the pandemic.

4.3.2. As to work load

FT#1, FT#3, and FT#6 provided good insights on work load. FT#1 thinks his work load is reasonable despite having to work on Sundays occasionally. FT#3 noted that his work load actually affects quality time

with his parents because of sheer distance that he needs to travel from his current area of assignment to his place of residence. FT#6 similarly thinks that his work load also affects his quality time with his family.

4.3.3. As to perceived job alternatives

FT#1, FT#2, FT#3, FT#4,FT#5, FT#7, and FT#9 provided additional insights. FT#1, FT#3, FT#4, FT#5, and FT#7 noted weak perceptions of job alternatives citing, among others, rigorous health protocols when applying for a new job, uncertainty of the times. FT#3 confirmed the same weak perception of job alternatives even for those with working experience. On the other hand, FT#2 and FT#9 believes it will not be difficult for them to get another job due to their work experience and friends in the industry.

4.3.4. As to job satisfaction

No additional comment was generated for job satisfaction.

4.3.5. As to impact of the Covid pandemic

FT#1, FT#3, FT#4, FT#5, FT#7, FT#8, and FT#9 provided useful additional insights on the impact of the Covid pandemic. FT#1 talked about frequent postponement of planned activities. FT#3 noted that farmers themselves are afraid to go out and participate in field activities. FT#4, FT#5 and FT#8 added that their mobility was restricted giving them limited access to farmers. IncidentallyFT#5 thought his work load in fact decreased due to the travel restrictions.

Two interesting insights about the impact of the Covid pandemic in relation to job satisfaction were secured. FT#8 confessed that his job satisfaction decreased because of Covid due to his inability to help farmers. On the other hand, FT#9 said he learned to love his job more because of the Covid pandemic.

4.3.6. As to turn-over intention

Interestingly, no additional insights were secured for turn-over intention other than the general trend of weak turn-over intention among the respondents.

4..4. Consistency with past studies

The findings in the In-depth interviews among active FTs show consistency with the reviewed previous studies as to the effect of work environment, work load, and perceived job alternatives on turn-over intention, as mediated by job satisfaction. A favorable work environment, a reasonable work load, and a weak perception of job alternatives result to high job satisfaction which in turn leads to low turn-over intention.

The above statement is actually in agreement with the findings from the exit interviews of the resigned FTs. Unfavorable work environment, work overload, and high perceptions of job alternatives will lead to job dissatisfaction and eventually to strong turnover intentions.

The impact of the Covid pandemic, as expected, provided novelty and a different perspective on the interplay of turnover intention and the factors driving such intention. While the Covid pandemic generally leads to worse work environment and increased work load, there were interesting insights noted as to the impact of the Covid pandemic as to job satisfaction. The exceptions noted in this case certainly merits further study.

4.5. Implications of the study

The above findings will be very useful for the company employing the FTs. Understanding the dynamics of job satisfaction and the drivers of turn-over intentions, amidst the Covid Pandemic will help the company implement the appropriate and timely macroergonomic interventions to prevent further turn-over and retain important employees like FTs.

4.6. Limitations of the study

An end-to-end approach, similar to the socio technical approach of the Macroergonomic Work Analysis conducted by Guimarães (2014) would have been ideal if not for the time constraints to complete the study.

The measures of the constructs can also be improved, particularly with regards to the impact of Covid on job satisfaction. A larger sample of interviewees should have improved conclusiveness of the study.

Given the qualitative nature of the study, a more, intensive quantitative analysis, possibly employing the Structural Equation Modeling tool, should further strengthen the impact of studies in similar subject matter. This future quantitative study can likewise further examine the extent of the mediating effect of job satisfaction (on the relationship between turn-over intention and each of the three (3) drivers of such intentions) and the moderating effect of the Covid pandemic (on the association between the job-satisfaction-mediated association between turn-over intention and each of the three (3) drivers of such intention).

5. Conclusion

Unfavorable work environment, work overload, and attractive job alternatives were the major reasons which drove actual turn-over among the FTs. In contrast, the subsequent in-depth interviews from the sample of ten (10) active FTs showed high job satisfaction and weak turn-over intention notwithstanding the adverse effect of the Covid pandemic on the work routine of the FTs.

While most of the active FTs interviewed thought that the Covid pandemic made their work environment worse and increased their work load, these negative factors did not make them look for another job. Interestingly, the active FTs were split with regards to the impact of the Covid pandemic on job satisfaction.

The current Covid pandemic protocols and their impact on drivers of turn-over intention, are expected to persist for the next three (3) years. Business organizations which will continue to operate under these so-called New Normal will need to be proactive and prepare for doing things differently.

The above findings, including the conduct and structure of the study set forth the bases for the following macroergonomic interventions for the company [24], [25]:

5.1. Appraisal

A participatory approach was employed in the appraisal stage, eliciting direct participation from the resigned FTs. Exit interviews of the resigned FTs were conducted by the Human Resources Department to understand the main reasons for resignations.

5.2. Diagnostics

A simple analysis of the findings in the exit interviews gave rise to 3 major reasons for the high turn-over rate — work environment, work load, and perceived job alternatives. Given these finding of job dissatisfaction from the resigned FTs, a similar participatory approach was employed to determine turn-over intentions and job satisfaction among the current crop of FT's. The direct participation of a sample of ten (10) FTs was secured by way of a structured in-depth interview. A second round of diagnostics on the in-depth interview results showed a general trend of high job satisfaction and weak turn-over intention among the current crop of FTs.

5.3. Proposal of solutions

An Ergonomics Team composed of at least three (3) core members shall oversee the implementation of the proposed plan as summarized in Table 6 below.

Timing Action Method Re-design of field activities amidst Covid Pandemic Review of FT: Supervisor Jan 2022 reporting system Observation. to Review alignment of interviews Feb 2022 incentive scheme with FT activities Review hiring and onboarding processes for FTs Secure management Meeting Mar 2022 approval for proposals presentation,

Table 6: Timeline of project

		discussion
Apr 2022	Implement new system re field activities, reporting system, incentive scheme and on-boarding	Launch meeting with FTs
June 2022	Secure FT feedback on new system re field activities, reporting system, incentive scheme, and on-boarding	Survey, interviews

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