



Research article

The application of Herzberg's two-factor theory of motivation to job satisfaction in clinical laboratories in Omani hospitals



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ABSTRACT

Background: Job satisfaction is an important condition for staff retention in most healthcare Organizations. As a concept, job satisfaction is linked to motivation theory. Herzberg's two factor theory of motivation is used in this study to explore what motivational elements are associated with job satisfaction among medical laboratory professionals (MLPs) in Oman.

Methods: A mixed-method approach was adopted, and focus group discussions (FGDs) were used for data collection. The FGDs were conducted in the main hospitals in Oman. Data were analyzed by directed content analysis, and frequencies of statements related to factors were calculated for a comparison with the Herzberg theory.

Results: The following job dissatisfaction factors (hygiene) were identified: health and safety, heavy workload, salary, promotion, recognition and organizational policies. The satisfaction (motivators) were: relationships with co-workers, relationship with leaders, and professional development.

Conclusions: The job dissatisfaction reported was resulted from the absence of hygiene factors and some of the motivators in accordance with Hertzberg's theory. Hospital managers need to address these factors, defined by Hertzberg, in order to improve motivation and job satisfaction.

1. Introduction

1.1. Background

The Sultanate of Oman has reached a level of distinction in its health sector, as the Ministry of Health (MOH) established a health system framework by enrolling large numbers of expatriate healthcare professionals and by introducing a referral system throughout its healthcare organizations. The Sultanate's healthcare system requires people management strategies that consider job satisfaction an important factor underpinning of growth, productivity, human resource development, and staff retention. Such strategies must be capable of assessing the

satisfaction of any group through various indicators, such as the quality of the health service provided.

The MOH is the main health service provider in Oman (80%) and accounts for 6.3% of total government expenditures (The Department of Health Information and Statistics, 2016).

The Royal Hospital, Khoula Hospital and Al Nahdha Hospital Each has specialty departments that operate as referral points for patients. Additionally, the hospitals provide tertiary and general acute care. The Royal and Khoula Hospitals enjoy maximum autonomy within the MOH, while the Al Nahdha Hospital is an autonomous hospital within the Directorate Office of the Muscat Governorate. Given the status of these hospitals, it is vital that they are staffed with individuals who are committed to their jobs; as a first step, these individuals must be satisfied

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with their jobs. Job satisfaction is the degree of positive affect that an employee feels towards the organization. It may be a general satisfaction with the job or with specific dimensions of the job or workplace, such as promotions, pay, and relationships with coworkers (Blaauw et al., 2013).

Job satisfaction is described as being key in promoting feelings of fulfillment through promotions, recognition, salaries, and the achievement of goals (Ausloos and Pekalski, 2007). George and Jones (2008) defined job satisfaction as a collection of feelings that people have towards their job. Specifically, with respect to health workers, job satisfaction is known to influence motivation, staff performance, and retention, which in turn affect the successful implementation of health system reform (Wang et al., 2017). Motivation among workers requires an encouraging work environment, which does not happen by chance.

A productive environment can be generated by addressing the factors that influence employee job satisfaction and then designing interventions that can be implemented by managers to include and enhance those factors (Munyewende et al., 2014). Unfortunately, in the health sector, there is poor job satisfaction caused by low income, poor working conditions, and limited opportunities for career development within healthcare organizations (Hotchkiss et al., 2015). A recent study reported that 75.3% of health care workers were dissatisfied with their working environment, salary, promotion and benefits, whereas the relationships with leaders and co-workers were satisfaction factors (Verma et al., 2019). In an earlier study pay, promotion, training and development, relations with supervisors, poor working conditions and organizational policies were the main factors for job dissatisfaction among health workers in eastern Ethiopia (Geleto et al., 2015). Lack of professional development and training opportunities reported by 90% of medical laboratory professionals as the most important factor affecting their job satisfaction (Marinucci et al., 2013). On the other hand, the relationships with leaders and peers contributed most to satisfaction, whereas the salary was a dissatisfaction factor (Lu et al., 2016).

Given this scenario, the purpose of this study was to determine the factors that promote job satisfaction for MLPs and to consider MLPs' work motivation in terms of Herzberg's two-factor theory of motivation. This study is the first of its kind among this group of health professionals in Oman and contributes to developing an understanding of the factors involved in encouraging satisfaction and dissatisfaction in the medical laboratories of the three hospitals concerned. By paying due attention to differences in context, the findings may be generalized to other similar facilities.

1.2. Herzberg's two-factor theory of motivation

Most theories discuss job satisfaction within the context of motivation (Kian et al., 2014). The Herzberg theory has been used as a method to explore job satisfaction among employees (Lundberg et al., 2009). According to Herzberg's theory of motivation applied to the workplace, there are two types of motivating factors: 1) satisfiers (motivators), which are the main drivers of job satisfaction and include achievements, recognition, responsibility, and work advancement, and 2) dissatisfiers (hygiene factors), which are the main causes of job dissatisfaction (Herzberg, 1966) and include factors such as working conditions, salaries, relationships with colleagues, administrative policies, and supervision. Herzberg used this model to explain that an individual at work can be satisfied and dissatisfied at the same time as these two sets of factors work in separate sequences. For example, hygiene factors (dissatisfiers) cannot increase or decrease satisfaction; they can affect only the degree of dissatisfaction. Satisfiers (motivational elements) need to be harmonized with hygiene factors to achieve job satisfaction at work. Managers in healthcare organizations should understand this relationship.

In Maslow's theory of motivation, the lower needs on the proposed pyramid must be met before the higher needs; this idea can be considered parallel to that of motivational and hygiene factors because hygiene

factors must be present to allow motivational factors to emerge and thereby prevent job dissatisfaction (Maslow, 1954). Hence, the motivators in Herzberg's theory are similar to the intrinsic factors (higher needs) in Maslow's theory. The extrinsic factors in Maslow's theory resemble the hygiene factors (dissatisfiers) in Herzberg's two-factor theory.

In 1975, Rogers summarized Herzberg's two-factor theory as follows: "In other words, adequate salary, good working conditions, respected supervisors and likeable co-workers will not produce a satisfied worker; they will only produce a worker who is not dissatisfied. However, their levels must be acceptable in order for the motivation factors to become operative. In other words, like medical hygiene practices, they cannot cure an illness, but they can aid in preventing it" (Rogers, 1975).

1.3. Application of Herzberg's theory in different contexts

Herzberg's two-factor theory has been widely applied in studies on staff satisfaction, but mostly in other industries and for other occupational groups than health professionals. For example, Ruthankoon and Ogunlana tested Herzberg's two factor theory and concluded that different hygiene and motivation factors are applicable in different occupations in the Thai construction industry (Ruthankoon and Olu Ogunlana, 2003). In the Pakistani context, these factors reported to be a strong moderator for job satisfaction among staff in insurance companies (Rahman et al., 2017). Other examples include the hospitality industry (Hsiao et al., 2016) and mobile data services (Lee et al., 2009). We have not found comparable studies in health care, and all types of studies on job satisfaction in clinical laboratories are scarce.

2. Methods

In order to explore the views of medical laboratory professionals on their workplace and what factors had a positive or negative effect on their job satisfaction a series of focus group discussions (FGD) were performed. The advantage of a focus group compared to individual interviews is that the discussion among participants will help to clarify opinions, provoke more in-depth reasoning, and to disclose whether opinions are shared by many. Whilst a focus group discussion is a qualitative research approach, it also enables a semi-quantitative analysis of statements made. This study employs such a mixed-methods approach.

The FGDs were conducted from February to June 2017 at each of the three main MOH hospitals: the Royal, Al Nahdha and Khoula Hospitals.

2.1. Setting and participants

Medical laboratory professionals working in hematology, biochemistry, pathology, and microbiology laboratories including senior and junior staff from the three main hospitals participated in the FGDs: nine groups from the Royal Hospital, five groups from Khoula Hospital, and four groups from Al Nahdha Hospital. Each group had between six and eight participants (Krueger and Casey, 2015).

To obtain this sample, the author sent a letter describing the purpose of the study to the supervisors of each laboratory and asking MLP volunteers. Anonymity (through the use of code names) and confidentiality were strictly observed in recognition of the need for good research ethics and the requirements of Omani and Swedish legislation, as well as to preserve personal integrity. A total of 101 medical laboratory professionals participated in the FGDs. The demography of the participants is exhibited in Appendix I, showing that the participants were representative of all laboratory staff in the three hospitals.

2.2. Focus group discussion (FGD) procedures

The FGDs were moderated by the first author with the support of an observer. The Focus Group discussions gave respondents freedom to express their feelings in order to obtain data representing the purpose of

the study. The discussion was facilitated by the first author, following an interview guide, derived from Hertzberg's two factor theory. The FGD sessions lasted between 60 to 90 min. At the end of each discussion, the findings were summarized and shared with the participants (member checking), for validating the results and increasing the credibility of the study (Birt et al., 2016).

2.3. Data analysis

The FGDs were recorded and stored on a USB stick accessible only by the first author. The recorded material was transcribed by the observer and checked against observational and summary notes made by the moderator immediately after each FGD. The transcriptions and additions from the notes were scrutinized by directed content analysis, guided by the Hertzberg two-factor theory. Meaning units expressing opinions of motivating and hygiene factors were identified and condensed into categories and further into themes. Eventually, "cut and paste technique" used manually with a poster and coloured pens (Krueger, 1996). This process was done by the moderator and observer independently. Results were compared and consensus reached after discussions. For each theme, the opinions of FGD participants, were condensed into "statements" and their frequencies were calculated, following the example of Herzberg (1968). This made it possible to compare the profile of motivating and hygiene factors of medical laboratory professionals with the original theory of Hertzberg.

2.4. Ethics approval and consent to participate

Personal integrity was guaranteed. Participation was voluntary, and informed consent was obtained from all the participants after fully disclosing the purpose of the study. Data storage and handling complied with the requirements of Swedish legislation on research ethics and personal data. The study was approved by the Research and Ethical Review and Approval Committee of MOH in Oman NO: (MH/DGP/R&S/PROPOSAL, 2016).

3. Results

The FGDs recorded the participant's opinions of the individual needs and other factors that affected their job satisfaction at work; these opinions were condensed into categories and from those eight major themes emerged. (See Table 1). The themes are presented together with illustrative citations from the FGDs.

3.1. Laboratory health and safety

From participants' perspective, the major dissatisfier in each of the three hospitals was a lack of health and safety in the laboratories. Poor ventilation and exposure to toxic chemicals were cited reasons in some departments, as well as the receipt of clinical samples without biohazard labels. The lack of biohazard labels was considered to be due to carelessness of some nurses, posing a risk to the laboratory workers.

"Some specimens are sent to the laboratory without a biohazard label, and only after processing will we know it is infectious, such as HIV" (FGD2, RH).

"We are having ventilation problems in the laboratory while processing specimens" (FGD3, NH).

"It is really not safe working in an infectious environment. I was exposed to a viral infection while processing a sample that had no biohazard sticker, and I was treated for three weeks" (FGD2, KH).

3.2. Professional status (recognition and appreciation)

The MLPs believed that there was no appreciation or recognition of their good performance even though they worked in a risky environment. They received no compensation for their commitment in the face of such risk, and felt that because they worked behind the scenes, clinicians were unaware of the time they spent processing samples or the hazards involved in their work.

Table 1. Categories and themes related to job satisfaction and job dissatisfaction among medical laboratory professionals at Royal, Khoula, and Al Nahdha Hospitals.

	Themes	Categories
Job Satisfaction	Professional development	<ul style="list-style-type: none"> • Having monthly lectures on interested cases. • Conducting workshop. • Fair chances in attending conferences. • Improved professional education. • Participating in training sessions.
	Relationships with co-workers	<ul style="list-style-type: none"> • Cooperation at work. • Friendship.
	Relationships with leaders	<ul style="list-style-type: none"> • Rapport. • Interdependence.
Job Dissatisfaction	Health and Safety	<ul style="list-style-type: none"> • Infectious specimens received has no biohazard details. • Exposer to hazardous chemicals daily with bad ventilation system. • Lack of safety officers. • Congested working environment. • Lack of health and safety training.
	Professional status (recognition and appreciation)	<ul style="list-style-type: none"> • Feeling working behind the sense. • Negative feeling for the titles as "Laboratory Technician". • Lack of appreciation from clinicians. • Lack of recognition. • Feeling undervalued. • Lack of rewards.
	Workload	<ul style="list-style-type: none"> • Shortage of staff. • Unplanned leaves. • Excessive workload. • Continuous flow of samples. • Feeling overloaded at night shift duty. • Exhaustion at the end of work.
	Salary and Promotions	<ul style="list-style-type: none"> • Unfairness of new medical bylaw. • Lack of risk allowance. • Low salary compared to the performed work.

"The clinicians shout at us if they need the results; in this hospital, the nurses are more recognized than we are" (FGD1, KH).

"We work behind the scenes, we are not appreciated, and we don't want to be called 'laboratory technicians'. This name should be changed" (FGD2, RH).

"I feel undervalued in this hospital, and I dislike working in the laboratory" (FGD2, NH).

3.3. Heavy workload

FGDs participants identified workload as another dissatisfier, especially when colleagues took unplanned leave, which lead to the accumulation of samples for processing and for others to handle. In addition, the participants mentioned that the night shift workers were overloaded, irrespective of whether personnel were on leave, because samples referred from other hospitals during the day.

"The unplanned leave for staff causes shortages and heavy workload" (FGD2, RH).

"We are overloaded with a continuous flow of samples during the night shift" (FGD5, KH).

3.4. Professional development and training

Professional development emerged as a satisfaction factor for participants from all three hospitals. Indeed, some hospitals had monthly lectures to discuss interesting cases in their departments, and there were also opportunities to attend courses. The Al Nahdha Hospital MLPs expressed satisfaction with their professional development, as they were given the chance to attend training sessions.

"We have good chances for higher education in this hospital" (FGD1, KH).

"I have attended several conferences since I started the job" (FGD2, NH).

3.5. Salary and promotion

The Royal hospital MLPs also reported dissatisfaction with their salaries, believing that they deserved higher salaries and bonuses since they had to work more night shifts than MLPs in other hospitals in the country.

The MLPs in all three main hospitals (the Royal, Al Nahdha, and Khoula Hospitals) also noted that they were unhappy with the new Medical and Allied Health Personnel Executive Bylaw, introduced in 2014 for paramedical staff, which defined the rules for the employment, promotion, retention development and termination of medical and allied health personnel. At Al Nahdha Hospital, the new promotion system is by no means clear, there has been no explanation of the system by anyone, and promotions for some technologists have been delayed for a long time. At Khoula Hospital, the MLPs felt that the new Bylaw did not motivate them to work any harder, as the system does not discriminate between a hard worker and others.

At the Royal Hospital, the participants expressed dissatisfaction concerning an overall unfairness of the system, as it does not recognize workers' formal qualifications; indeed, some of the participants had higher qualifications than others but received exactly the same salary as their less-qualified counterparts.

"The new Medical and Allied Health Personnel Executive Bylaw is unfair. I have 26 years of experience. However, I am getting less pay compared to new members of staff" (FGD6, RH).

"We do not have any risk allowance in our work" (FGD3, NH).

"I wish there was some motivation at work in this hospital. Unfortunately, after the new medical bylaw, there is NO difference between a hard worker and others" (FGD5, KH).

3.6. Organization Policies (job descriptions and appraisals)

In the Royal, Al Nahdha, and Khoula Hospitals, the formal job descriptions of MLPs were found to be a dissatisfier. MLPs complained that it was a generic description that was suitable only for junior staff and did not capture what senior staff members do. Other participants from other departments mentioned that, in fact, they did not have job descriptions at all and worked solely based on the instructions of their supervisors. Appraisals emerged as the second sub-factor mentioned in all three focus groups. All the MLPs were dissatisfied with the appraisal process because MLPs are not shown their annual evaluations, and they do not know what is reported about them central administration. MLPs can learn about their annual scores only when they apply for higher education.

"We only have an internal job description from the head of the department, and it is general for all" (FGD1, KH).

"I don't have a job description; I have to work only according to my supervisor's orders" (FGD5, RH).

"We do not see the annual evaluations; the head of the department and the supervisor are allowed to revise them and then send them to the administration" (FGD2, NH).

3.7. Relationships with leaders

In all three hospitals, the relationships between supervisors and MLPs were good.

"There is a good relationship between us and our head of the department, and this makes me happy in this laboratory" (FGD3, RH).

3.8. Relationships with coworkers

The MLPs expressed satisfaction with the relationships between coworkers in the laboratories.

"Everybody is cooperative in the laboratory; we help each other" (FGD1, KH).

The themes derived correspond in most instances with the factors of the Hertzberg theory. Laboratory health and safety in this study corresponds to Herzberg's factors' working condition". Professional status (recognition and appreciation) is an expression of "recognition" as a job satisfier. The heavy workload in this study represent the "responsibility" in Herzberg's study as a hygiene factor. The "possibility of growth" in Herzberg's study is presented by professional development in this paper. Salary is a hygiene factor. "Advancement" corresponds to promotion. Organization Policies are an expression of "Company policies and administration" and defines the organizational context. Relationships with leaders are equal to "relationships with supervisors" in Herzberg's theory. Also "relationships with peers" in the theory correspond to relationships with co-workers in this study.

As in Hertzberg's theory, the categories identified in the content analysis were could be categorized as hygiene factors motivators; with considerable overlaps, as categories contributed to both satisfaction and dissatisfaction to varying degrees. This is shown in Figure 1, where the frequencies of all statements derived from the FGDs are displayed, and compared to Hertzberg's original distribution of factors across the motivator and hygiene factor continuum (Herzberg, 1968). The frequencies, specified as percentages, are to be found in (Table 2).

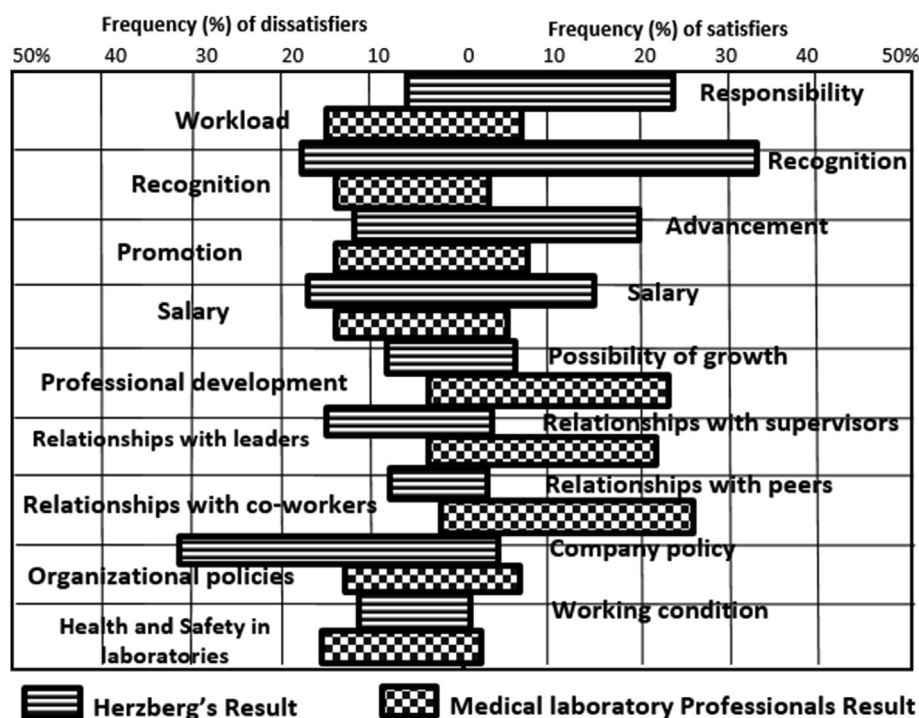


Figure 1. Comparison of hygiene factors and motivators between Herzberg and the MLPs (Herzberg, 1968).

Table 2. The percentage of each factor appearing in the satisfying and dissatisfying sequences from FGDs.

Factors	Satisfying sequences	Dissatisfying sequences
Health and Safety in the laboratories	2%	16%
Workload	7%	15%
Salary	5%	14%
Promotion	8%	14%
Organizational policies	6%	12%
Recognition	3%	12%
Relationships with co-workers	26%	2%
Professional development	22%	4%
Relationships with leaders	21%	3%

As explained by Herzberg's two-factor theory, the results demonstrated that the MLPs were not well motivated by their work environment (see Figure 1).

4. Discussion

The absence of health and safety in all laboratories was the most frequently mentioned source of job dissatisfaction among medical laboratory professionals (dissatisfied 16 per cent, and satisfied 2 per cent).

This is in agreement with Herzberg's theory. The dissatisfaction among the research population echoes the results found in a previous study with health workers demonstrating that the health and safety hazards that the workers encountered in their work had negative impacts on them 438 (Altaimer and Hansen, 2012). Exposure to multiple hazards is known to affect the health of groups of workers, as noted by Danna and Griffin (1999), who found, for example, that allergies and respirator system diseases were 40–50% higher among workers who worked in a poorly ventilated environment.

Maslow's theory of motivation suggests that safety is a lower-order need that must be met before higher-order needs can be satisfied. Likewise, in Herzberg's two-factor theory, hygiene factors (dissatisfiers) must

be met in order to prevent dissatisfaction, in this case, within a healthcare institution (Dieleman et al., 2003).

A heavy workload quite understandingly leads to job dissatisfaction (dissatisfied 15 per cent, and satisfied 7 per cent). Consequently, it is a hygiene factor, not a motivator as predicted in the Herzberg theory. That this theme is a dissatisfier for health workers was also found in a recent study from Africa (Temesgen et al., 2018).

Salary and promotion seem to play a significant role in demotivating the medical laboratory professionals in the three hospitals (dissatisfied 14 per cent, and satisfied 5 per cent, 8 per cent respectively). They expressed that the new Medical and Allied Health Personnel Bylaw recently introduced was unjust since it does not differentiate between old and new employee as to rewards, and promotion is no longer automatically received, but requires that a new position is established.

Herzberg's two-factor theory suggests that salary is a motivator, but that after some time, it tends to become a dissatisfier (hygiene factor) for employees. In our study, salary is defined as a dissatisfaction factor, while promotion (advancement) is appreciated by participants in our groups of medical laboratory professionals.

Herzberg highlighted the importance of promotion opportunities as a motivating factor among employees (Herzberg et al., 1959). The way

workers are rewarded effects productivity and, therefore, the quality of care that must be monitored in health organizations (WHO, 2006).

Consequently, the creation of new positions is important to encourage and retain workers (Timmreck, 2001). This result is consistent with the findings of another study regarding the dissatisfaction of healthcare professionals due to low salaries and poor working conditions (Wang et al., 2017). The finding is similar to those of a previous study conducted in Oman among healthcare professionals in a regional hospital (Al Maqbali, 2015) and of other studies carried out with healthcare workers in Africa (Deriba et al., 2017) and in Pakistan (Tasneem et al., 2018).

The findings regarding the participants' feelings are consistent with those reported in a previous study performed at the University Hospital in Oman (Alrawahi et al., 2018). As noted by Kostea (2010), promotions are the main mechanism for achieving worker retention and satisfaction.

In this study, recognition and organizational policies were mostly a hygiene factor with more dissatisfied than satisfied (12 per cent vs 3 per cent and 6 per cent respectively). How recognition is perceived by the medical laboratory professionals seem to contradict Herzberg's theory, being a hygiene rather than a motivator factor. Organizational policies, on the other hand were in line with the theory.

All of these findings are consistent with those of an earlier study of clinical laboratories (Doig and Beck, 2019). According to Herzberg's two-factor theory, recognition is an important motivator for employees (Bassett-Jones and Lloyd, 2005), but in this study, its importance was reflected in the lack of recognition being a cause of dissatisfaction. There is clear potential for exploitation in such situations. Indeed, the participants with job descriptions complained that they did much more in their laboratories than what the job description outlined and was thus expected of them.

This means that participants have no idea whether they are considered to be performing adequately or well. In addition to complaining about the secrecy of the process, some MLPs also claimed that the head of the department being the evaluator is not appropriate since he or she has no direct contact with them and hence is not in a position to make an objective judgment. This shortcoming was reported in another study with nurses in South Africa (Pillay, 2009). The WHO reported in 2006 that to improve the competence and quality of healthcare workers, their supervision should be enhanced by the provision of clear job descriptions and feedback on performance for junior staff. Any improvement in this respect would serve to motivate MLPs. consequently, the administration should incorporate rather than prevent motivational factors in laboratories.

Relations with co-workers, relation with leaders and professional development are three factors seen as important motivating factors, high on the positive end of the continuum (satisfied 26 per cent, 21 per cent, and 22 per cent respectively). As reported in the study by McAuliffe et al. (2013), if supervisors are supportive and work cooperatively with subordinates to solve work problems, workers' job satisfaction and motivation can be improved. Hence, Herzberg's proposal that harmonious relationships with work colleagues can prevent dissatisfaction is confirmed (Byrne, 2006). However, in other studies conducted elsewhere, MLPs have been found to be dissatisfied with training and development opportunities. Such findings have been reported in Kuwait (Al-Enezi et al., 2009) and China (Wang et al., 2017).

5. Methodological considerations

This was a qualitative study, utilizing focus group discussions, to throw light on Omani medical laboratory professionals' views of factors related to their job satisfaction, interpreted through the lens of Herzberg's two-factor theory. As such, the findings cannot be generalized to the whole population of MLPs, although the number of participants was

large, and the participants were well representative of the laboratory staff of the three hospitals involved. This made the semi-quantitative analysis, which was used to compare how well the findings corresponded with Herzberg's theory, possible and defensible. The use of three hospitals as a basis for participant recruitment adds to the trustworthiness of the results. The fact that there were large consistencies in opinions between the groups from the different hospitals reduces the risk that the patterns observed were distorted by the use of the interview method.

However, the choice of FGDs as the primary data collection approach and the quantitative comparison of the distribution of hygiene factors and satisfiers with the original findings of Herzberg, need to be scrutinized. Herzberg's study, used as the reference in this analysis, applied the "critical incident technique" (CIT), originally designed by Flanagan, 1954, and collected its data by individual interviews (Herzberg, 1968).

When applying the original CIT approach an interviewee is asked to reflect on a situation (i.e. which led to job dissatisfaction) and to describe how that was related to the outcome. However, later the technique has been developed to engage groups (usually of experts) that identify such critical incidents and formulate those as "statements" (Gordon, 2014). Focus group interviews of MLPs were thus chosen as the main data collection method in order to capitalize on the strengths of that method. The main advantage is that the discussion initiated will increase the probability that different perspectives and opinions are expressed. A focus group of peers will also increase the possibility that more important issues are separated from less important ones, and whether there is agreement or disagreement, thus resembling the process of an expert group involved in a CIT exercise or a consensus producing nominal group (Tausch and Menold, 2016). On the other hand, the disadvantages of using FGDs must also be raised, such as participants being more or less vocal, and that sensitive topics might be less easy to comment when in a group, and that group pressure might silence participants. We have to acknowledge that those risks might have materialized during the FGD sessions, potentially distorting the results. However, we reasoned that the advantages would outweigh the disadvantages, and enable us to perform both the content analysis of the material and the quantitative comparison with Herzberg's original profile of factors.

6. Conclusions

Several important conclusions can be drawn based on the review of the literature related to job satisfaction in general and in healthcare specifically and the empirical study with MLPs from the three main hospitals in Oman. In particular, this study suggests that the main source of dissatisfaction is a lack of laboratory health and safety; heavy workloads; the promotion system, which is perceived as unfair and unworkable; poor salaries; certain organizational policies (namely, the appraisal system and inappropriate job descriptions); and the lack of recognition for the professional status of the MLPs by other colleagues outside of the laboratories, who have no appreciation of the work that MLPs perform.

To address these dissatisfiers, these hospitals must be acknowledged as referral hospital that receive more samples than other hospitals, and, consequently, to safe-guard a greater laboratory workforce to ensure that MLPs are not overloaded. Additionally, the issue of wider-scale awareness within the hospitals of the value of MLPs should be considered.

Additionally, as the MLPs were dissatisfied with the opportunities for promotion resulting from the newly introduced Medical and Allied Health Personnel Executive Bylaw, policy-makers should consider to re-evaluate that legislation.

A decline in the recognition of MLPs' efforts brought less productivity and commitment, whereas an increase in the recognition of their work and professionalism will promote satisfaction.

MLPs' unhappiness with their overall conditions, and especially with the level of health and safety in the laboratories, function as dissatisfiers, yet improvements in their relationship with leaders (through the recognition of their worth) will increase their satisfaction. The dissatisfaction experienced by the research population is a result of the absence of factors that cause satisfaction, and consequently, it is the responsibility of hospital administrations to develop good systems to improve MLPs' job satisfaction. Effective cooperation between the laboratory managers and hospital administrations will enable the achievement of job satisfaction among MLPs.

Therefore, it is essential that hospital management pays attention to hygiene factors of importance to this group of healthcare professionals to avoid job dissatisfaction and simultaneously provide motivators within the working environment to achieve job satisfaction.

This study is one of the few analyzing factors of importance for the job satisfaction of medical laboratory professionals. It was performed in three hospitals in Oman, and the results cannot necessarily be generalized to other contexts. It did, though, highlight which factors of a widely used theory on staff motivation that promote or reduce job satisfaction in this specific group of health professionals. Applying those insights, carefully tailored to the organizational context in question, might lead to improved working conditions in medical laboratories beyond our study setting also.

Most, but not all, of the factors of Herzberg's Motivation Theory were identified in our study. Depending on different contexts, the motivation figure of employees will vary from one setting to another. Since what is recognized as a motivator in one culture may be a de-motivator in another culture (Al-Akeel and Jahangir, 2020). Comparative studies could shed light on how Herzberg's theory is best applied in different organizational contexts.

Appendix I

Table 3. Sociodemographic variables of the medical laboratory professionals at Royal Hospital

Sociodemographic Variables	Royal Population		FGD Participants	
	No.	%	No.	%
Age (years):				
<25	4	3	1	2
25-34	41	30	28	54
35-44	54	39	16	31
45-54	31	23	5	10
>54	7	5	2	4
Gender:				
Male	63	46	24	46
Female	74	54	28	54
Years of Experience:				
<5	31	23	28	54
5-9	41	30	15	29
10-14	20	15	3	6
15-20	23	17	3	6
>20	22	16	3	6
Nationality:				
Omani	81	59	17	33
Non-Omani	56	41	35	67
Departments:				
Hematology	41	30	19	37
Microbiology	36	26	9	17
Biochemistry	33	24	14	27
Histopathology	27	20	10	19

Declarations

Author contribution statement

S. A. Al Rawahi: Conceived and designed the experiments; Performed the experiments; Analyzed and interpreted the data; Contributed reagents, materials, analysis tools or data; Wrote the paper.

S. Fransson Sellgren, M. Brommels: Analyzed and interpreted the data; Wrote the paper.

N. Al Wahaibi, S. Al Touby: Analyzed and interpreted the data.

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Competing interest statement

The authors declare no conflict of interest.

Additional information

No additional information is available for this paper.

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Table 4. Sociodemographic variables of the medical laboratory professionals at Al Nahdha Hospital

Sociodemographic Variables	Al Nahdha Population		FGD Participants	
	No.	%	No.	%
Age (years):				
<25	0	0	0	0
25-34	8	28	6	32
35-44	11	38	7	37
45-54	8	28	6	32
>54	2	7	0	0
Gender:				
Male	8	28	5	26
Female	21	72	14	74
Years of Experience:				
<5	5	17	7	37
5-9	5	17	5	26
10-14	6	21	1	5
15-20	10	35	6	32
>20	3	10	0	0
Nationality:				
Omani	11	38	4	21
Non-Omani	18	62	15	79
Departments:				
General Lab	29	100	19	100

Table 5. Sociodemographic variables of the medical laboratory professionals at Khoula Hospital

Sociodemographic Variables	Khoula Population		FGD Participants	
	No.	%	No.	%
Age (years):				
<25	2	3	1	3
25-34	13	18	10	33
35-44	35	49	15	50
45-54	19	27	3	10
>54	2	3	1	3
Gender:				
Male	22	31	5	83
Female	49	69	25	17
Years of Experience:				
<5	17	24	10	33
5-9	16	23	7	23
10-14	15	21	9	30
15-20	14	20	3	10
>20	9	13	1	3
Nationality:				
Omani	37	52	11	33
Non-Omani	34	48	19	67
Departments:				
Hematology	28	39	11	37
Microbiology	26	37	10	33
Biochemistry	17	24	9	30

References

- Al Maqbali, M., 2015. Job satisfaction of nurses in a regional hospital in Oman. *J. Nurs. Res.* 23 (3), 206–216.
- Al-Akeel, N., Jahangir, S., 2020. Relationship between employees' cultural background and work motivation (according to McClelland's need theory of motivation). *Int. J. Psychosoc. Rehabil.* 24 (Special Issue 1), 156–163.
- Al-Enezi, N., Chowdhury, R., Shah, M., Al-Otobi, M., 2009. Job satisfaction of nurses with multicultural backgrounds: a questionnaire survey in Kuwait. *Appl. Nurs. Res.* 22 (2), 94–100.
- Alrawahi, S., Sellgren, S., Alwahaibi, N., Altouby, S., Brommels, M., 2018. Factors affecting job satisfaction among medical laboratory technologists in University Hospital, Oman: an exploratory study. *Int. J. Health Plann. Manag.* 34 (1), e763–e775.
- Altmaier, E., Hansen, J., 2012. *The Oxford Handbook of Counseling Psychology*, first ed. Oxford University Press, New York.
- Ausloos, M., Pekalski, A., 2007. Model of wealth and goods dynamics in a closed market. *Phys. Stat. Mech. Appl.* 373, 560–568.
- Bassett Jones, N., Lloyd, G., 2005. Does Herzberg's motivation theory have staying power? *J. Manag. Dev.* 24 (10), 929–943.
- Birt, L., Scott, S., Cavers, D., Campbell, C., Walter, F., 2016. Member checking. *Qual. Health Res.* 26 (13), 1802–1811.
- Blaauw, D., Ditlopo, P., Maseko, F., Chirwa, M., Mwisongo, A., Bidwell, P., et al., 2013. Comparing the job satisfaction and intention to leave of different categories of health workers in Tanzania, Malawi, and South Africa. *Glob. Health Action* 6 (1), 19287.

- Byrne, M., 2006. The implications of Herzberg's "Motivation-Hygiene" theory for management in the Irish health sector. *Health Care Manag.* 25 (1), 4–11.
- Danna, K., Griffin, R., 1999. Health and well-being in the workplace: a review and synthesis of the literature. *J. Manag.* 25 (3), 357–384.
- Deriba, B., Sinke, S., Ereso, B., Badacho, A., 2017. Health professionals' job satisfaction and associated factors at public health centers in West Ethiopia. *Hum. Resour. Health* 15 (1).
- Dieleman, M., Cuong, P., Anh, L., Martineau, T., 2003. Identifying factors for job motivation of rural health workers in North Viet Nam. *Hum. Resour. Health* 1 (1).
- Doig, K., Beck, S., 2019. Factors contributing to the retention of clinical laboratory personnel. *Clin. Lab. Sci.* 18 (1).
- Geleto, A., Baraki, N., Atomsa, G., Dessie, Y., 2015. Job satisfaction and associated factors among health care providers at public health institutions in Harari region, eastern Ethiopia: a cross-sectional study. *BMC Res. Notes* 8 (1).
- George, J., Jones, G., 2008. *Understanding and Managing Organizational Behavior*, fifth ed. Pearson Education, Upper Saddle River, NJ.
- Gordon, L., 2014. *Critical Incident Technique*. LR Gordon, Incorporated, pp. 1–13.
- Herzberg, F., 1966. *Work and the Nature of Man*, first ed. World Publishing Company, Cleveland.
- Herzberg, F., 1968. One more time: How do you motivate employee? *Harv. Bus. Rev.* 46 (January-February), 53–62.
- Herzberg, F., Mausner, B., Snyderman, B., 1959. *The Motivation to Work*, second ed. John Wiley & Sons, New York.
- Hotchkiss, D., Banteyerga, H., Tharaney, M., 2015. Job satisfaction and motivation among public sector health workers: evidence from Ethiopia. *Hum. Resour. Health* 13 (1), 83–94.
- Hsiao, A., Ma, E., Auld, C., 2016. Organizational ethnic diversity and employees' satisfaction with hygiene and motivation factors—a comparative IPA approach. *J. Hospit. Market. Manag.* 26 (2), 144–163.
- Kian, T., Wan, W., Rajah, S., 2014. *European journal of business and social sciences*. Eur. J. Bus. Soc. Sci. 3 (2), 94–102.
- Kosteas, V., 2010. Job satisfaction and promotions. *Ind. Relat.: J. Econ. Soc.* 50 (1), 174–194.
- Krueger, R., 1996. In: Krueger, Richard A. (Ed.), *Focus Groups: A Practical Guide for Applied Research*, 2d edition, 13. Sage Publications, Inc., Thousand Oaks, CA, pp. 273–274. 1994. 255 + xiv pages. \$21.50. *Journal Of Product Innovation Management*.
- Krueger, R., Casey, M., 2015. *Focus Groups*. SAGE, Los Angeles.
- Lee, S., Shin, B., Lee, H., 2009. Understanding post-adoption usage of mobile data services: the role of supplier-side variables. *J. Assoc. Inf. Syst. Online* 10 (12), 860–888.
- Lu, Y., Hu, X., Huang, X., Zhuang, X., Guo, P., Feng, L., et al., 2016. Job satisfaction and associated factors among healthcare staff: a cross-sectional study in Guangdong Province, China. *BMJ Open* 6 (7), e011388.
- Lundberg, C., Gudmundson, A., Andersson, T., 2009. Herzberg's Two-Factor Theory of work motivation tested empirically on seasonal workers in hospitality and tourism. *Tourism Manag.* 30 (6), 890–899.
- Marinucci, F., Majigo, M., Wattleworth, M., Paterniti, A., Hossain, M., Redfield, R., 2013. Factors affecting job satisfaction and retention of medical laboratory professionals in seven countries of Sub-Saharan Africa. *Hum. Resour. Health* 11 (1).
- Maslow, A., 1954. *Motivation and Personality*, first ed. Harper & Brothers, New York.
- Maslow, A., 1954. The instinctoid nature of basic Needs. *J. Pers.* 22 (3), 326–347.
- McAuliffe, E., Daly, M., Kamwendo, F., Masanja, H., Sidat, M., de Pinho, H., 2013. The critical role of supervision in retaining staff in obstetric services: a three country study. *PLoS One* 8 (3).
- Munyewende, P., Rispel, L., Chirwa, T., 2014. Positive practice environments influence job satisfaction of primary health care clinic nursing managers in two South African provinces. *Hum. Resour. Health* 12 (1).
- Pillay, R., 2009. Work satisfaction of professional nurses in South Africa: a comparative analysis of the public and private sectors. *Hum. Resour. Health* 7 (1).
- Rahman, K., Akhter, W., Khan, S., 2017. Factors affecting employee job satisfaction: a comparative study of conventional and Islamic insurance. *Cogent Business & Management* 4 (1).
- Rogers, R., 1975. A protection motivation theory of fear appeals and attitude change. *J. Psychol.* 91 (1), 93–114.
- Ruthankoon, R., Olu Ogunlana, S., 2003. Testing Herzberg's two-factor theory in the Thai construction industry. *Eng. Construct. Architect. Manag.* 10 (5), 333–341.
- Tasneem, S., Gagatan, A., Avci, M., Basustaoglu, A., 2018. Job satisfaction of health service providers working in a public tertiary care hospital of Pakistan. *Open Publ. Health J.* 11 (1), 17–27.
- Tausch, A., Menold, N., 2016. Methodological aspects of focus groups in health research. *Global Qualitative Nursing Res.* 3, 233339361663046.
- Temesgen, K., Aycheh, M., Leshargie, C., 2018. Job satisfaction and associated factors among health professionals working at Western Amhara Region, Ethiopia. *Health Qual. Life Outcome* 16 (1).
- The Department of Health Information and Statistics, 2016. *Annual Health Report 2016*. Ministry of Health. Retrieved from. <https://www.moh.gov.om/en/web/statistics/-/20-44>.
- Timmreck, T., 2001. Managing motivation and developing job satisfaction in the health care work environment. *Health Care Manag.* 20 (1), 42–58.
- Verma, M., Singh, T., Kaur, M., Kumar, R., 2019. Job satisfaction among health care providers: a cross-sectional study in public health facilities of Punjab, India. *J. Fam. Med. Prim. Care* 8 (10), 3268.
- Wang, H., Tang, C., Zhao, S., Meng, Q., Liu, X., 2017. Job satisfaction among health-care staff in township health centers in rural China: results from a latent class Analysis. *Int. J. Environ. Res. Publ. Health* 14 (10), 1101.
- WHO, 2006. *The World Health Report 2006 - working together for health*. Retrieved from. <https://www.who.int/whr/2006/en/>.

Web References

- The Department of Health Information and Statistics, 2016. *Annual health report 2016*. Retrieved from <https://www.moh.gov.om/en/web/statistics/-/20-44>.
- WHO, 2006. *The world health report 2006 - working together for health*. Retrieved from. <https://www.who.int/whr/2006/en/>.