

## Stress And Job Satisfaction Among Medical Laboratory Professionals

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### Abstract

**Background:** Job satisfaction is a quality indicator that measures the cognitive and behavioral aspects of workers' attitudes toward their job. A positive psychological work environment is important to protect medical laboratory professionals' (MLPs') health, well-being and work ability. Job satisfaction leads to MLPs being more productive. However, when the job requirements do not meet the capabilities it will cause stress. Therefore, it is important to define the cause of dissatisfaction to reduce work-induced stress as this has a negative impact on the quality of healthcare services. The literature on stress and satisfaction studying MLPs is still limited. **The aim of this study** was to assess the relationships between stress and job satisfaction factors among MLPs in hospitals, and to quantify a possible correlation between job stress and job satisfaction. **Methods:** A cross sectional study involved all MLPs in the Al Noor Specialist Hospital in Makkah at KSA from January to March 2023, with 336 responding, applying a survey instrument measuring job satisfaction developed from results of qualitative studies. In addition, job stress was assessed using a survey based on the Nurse Stress Index (NSI). **Results:** The results show a significant statistical association between stress and job satisfaction. The most important dissatisfaction factors, leading to job stress, are insufficient support for professional development, poor relations with supervisors and co-workers, as well as heavy workload. **Conclusion:** This study emphasizes the importance of investing in measures to <sup>1</sup>meet the expectations of laboratory staff, to strengthen factors that increase satisfaction and eliminate dissatisfaction factors. It gives concrete advice on what those measures should be and, consequently, guides actions on improving the work environment in medical laboratories. When implemented those would reduce job stress among medical laboratory professionals and, possibly, more widely.

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## **Introduction**

Job satisfaction and motivation are vital in increasing the productivity and development of healthcare professionals and hospitals. For example, if medical laboratory professionals' (MLPs') are not satisfied with their profession, they cannot improve their performance and contribute to providing good-quality healthcare<sup>(1-3)</sup>. MLPs' job satisfaction had a major role in raising MLPs' enthusiasm, which had a positive impact on the quality of the provided work; consequently, leading to health organizations' success<sup>(4)</sup>. Job satisfaction among MLPs might be linked to work organization's degree and human relation<sup>(5)</sup>. It had a significant impact on their productivity, the quality of the provided care, and sometimes affects the cost of the health care<sup>(5,6)</sup>.

Most MLPs suffered from medical problems that had a potential impact on their job satisfaction, and most of them decided to leave the organization that directly increased the work stress and overload on the remaining staff, resulting in a poor quality of the provided care<sup>(4)</sup>. Job satisfaction is a multidimensional meaning associated with several factors<sup>(7)</sup>. Job satisfaction among MLPs is crucial and considered as an essential parameter that affects their productivity and work quality. There are different factors associated with MLPs' job satisfaction: socio-demographic factor (age, sex, length of work experience, and the nature of the work<sup>(8)</sup>). Also, feeling free to express and to be appreciated<sup>(9)</sup>, number of working hours, promotions, and salary<sup>(10)</sup>. MLPs face complex shift work and burnout that affects their satisfaction<sup>(8)</sup>.

The conflict of the work-family and the relationship between physicians and their patients also impacted the job satisfaction<sup>(11, 12)</sup>. Job satisfaction of MLPs had a good impact on patient satisfaction represented in a professional provided care<sup>(13)</sup>. The quality of the provided care in the hospitals is affected by job satisfaction factors such as staff scheduling, stress, and work environment<sup>(1)</sup>. MLPs' job satisfaction and the quality of the provided care are considered the two major factors that are responsible for increasing the organization's success and raising the efficacy of the health service<sup>(14)</sup>. Saudi Arabia is a fast-developing country and has a shortage of MLPs in hospitals that might be related to low job satisfaction among the health care staff<sup>(15)</sup>.

The extent of job satisfaction is an indicator of well-being in the workplace and central to creating a professional commitment to contribute to organizational goals<sup>(16, 17)</sup>. Job satisfaction is a combination of multidimensional psychological and personal responses that have cognitive (evaluative), affective (emotional) and behavioral components. Cognitive refers to an objective condition in nature and depends on the different facets of a job, while affective denotes a subjective condition that represents the feelings connected with the happiness of individuals about the job<sup>(16, 17)</sup>.

Additionally, highly motivated Healthcare staff is essential to ensure a high quality and efficient service in healthcare organizations. Motivation of Healthcare staff can initiate them to exert and maintain an effort towards organizational goals<sup>(18, 19)</sup>. Motivation among professional staff is dependent

on the following factors: achievement, recognition for achievement, the work itself, responsibility, and professional growth or advancement<sup>(18, 19)</sup>. A person with high motivation is more likely satisfied with her or his work<sup>(20)</sup>. Job dissatisfaction, on the other hand, can induce work-related stress<sup>(21)</sup>. However, satisfied Healthcare staff has positive perceptions towards their organizations and are more efficient at work<sup>(22)</sup>.

Consequently, it is important to pay attention to job satisfaction in all organizations including health care providers as it has an effect on the quality of the service<sup>(23)</sup>. High job satisfaction leads to Healthcare staff being more productive and providing a higher service quality<sup>(24)</sup>. Healthcare staff, including MLPs, may not contribute to a positive patient experience if their own needs are not met. Therefore, it is the task of healthcare managers to ensure satisfaction among their staff<sup>(25)</sup>. Despite its obvious importance job satisfaction has not been investigated in all professional groups in healthcare. Most previous studies have focused on nurses<sup>(26)</sup> and few are from low or middle-income countries.

A study from Africa showed that low salaries, lack of promotion, training and development, strained relations with supervisors, poor working conditions and unjust organizational policies were the main factors for job dissatisfaction among healthcare staff<sup>(27)</sup>. Demographic factors like gender, age, education level, designation, marital status and work conditions such as salary and shift work are also related to job satisfaction<sup>(28)</sup>. Stress at work is a physical and emotional reaction when the job requirements do not meet the capabilities of the worker<sup>(29)</sup>. Stress can also be caused by job dissatisfaction, which leads to poor performance. Therefore, it is important to define the cause for dissatisfaction to reduce work-induced stress, all the more as this, as pointed out above, has a negative impact on the quality of healthcare services<sup>(30)</sup>.

The relationship between stress and job satisfaction is well recognized. Salary, workload, health and safety, lack of recognition, training development, and lack of decision-making are dissatisfaction factors that lead to stress<sup>(31)</sup>. Stress at work were reported among hospital nurses in Iran, which led to medical incidents and was found to relate to job satisfaction, which in turn affected the level of turnover and lower retention rate, and ultimately work performance<sup>(32)</sup>. The safety of workers plays an important role for the productivity caused by concerns of shift work duties as reported by Khammar et al., (2017)<sup>(33)</sup>.

The Canadian Community Health Survey reported that medical laboratory technicians were one of the healthcare worker groups experiencing high job stress<sup>(34)</sup>. Another study showed that a high workload lead to dissatisfaction among medical laboratory personnel<sup>(35)</sup>. A study established that actions need to be taken to improve the level of motivation among medical laboratories to promote a good quality of the healthcare service<sup>(36)</sup>. In summary, there is limited previous research on to what extent job stress is associated with job satisfaction and especially among MLPs, above all in countries in the Middle East.

However, in previous study among medical laboratory professionals, based on interviews, the following major issues were associated with job satisfaction: workload felt suitable, autonomy, professional status, salary,

professional development, the relations with co-workers and head of departments, health and safety, organizational policies, stress, and job security. Moreover, the following refer to those as factors of job satisfaction. The factors associated with dissatisfaction were high workload, lack of health safety, unfair promotion system, lack of training opportunities, poor relationships with the leaders, and non-rewarding organizational policies. All of these latter factors contributed to higher levels of stress<sup>(37)</sup>.

Therefore, the aim of this study is to analyze whether those views on job satisfaction are more widely shared by MLPs in hospitals. It assesses differences in job satisfaction, overall and by component, and job stress between age groups, gender, and seniority. In addition, it aims at quantifying possible correlations between job stress and job satisfaction, overall and by factor.

## **Methods**

This is a cross-sectional study directed at all MLPs in the Al Noor Specialist Hospital in Makkah at KSA from January to March 2023, with 336 responding, applying a survey instrument measuring job satisfaction developed from results of qualitative studies<sup>(37, 38)</sup>. In addition, job stress was assessed using a survey based on the Nurse Stress Index<sup>(39)</sup>. To measure the importance of each job satisfaction factor identified in the previous study, a proposition was constructed and a response as to agreement was measured with a five-point Likert scale (strongly disagree=1, disagree=2, neutral=3, agree=4, strongly agree=5). As to job stress, the Nurse Stress Index<sup>(39)</sup> was used, with responses measured on a four-point Likert scale. All MLPs in the eight hospitals were invited to participate in the survey.

Before distributing the survey questionnaire, a pilot study was performed at among 10 MLPs chosen randomly (being senior, junior and chief analysts) and who were not to be included in the main study. The researchers discussed the questionnaire with them to ensure that the questions were understandable. These informants suggested that the questionnaire should be distributed and collected by the researcher in person, and not through the hospital administration, because of the sensitivity of the subject and to uphold confidentiality. The average time taken by the participants to complete the questionnaires was 15–25 min.

A panel of experts, representing medical laboratories, psychology, social sciences and biostatistics, reviewed the content validity of the job satisfaction questionnaire and the job stress questionnaire of this study. These experts concluded that, as all all-important aspects of job satisfaction and job stress questionnaire in that context were covered, meeting the criteria of content validity. As a measure of internal consistency, we calculated Cronbach's Alpha. It was 0.89 for the job satisfaction questionnaire and 0.87 for the job stress questionnaire with an overall value of 0.92. These values indicate that the questionnaire is statistically reliable.

The researchers combined both instruments into one questionnaire form, and added an initial part. **Questionnaire Part 1:** seeking information on

age, gender, and years of experiences, shift pattern, department, marital status, family location, and education level. **Questionnaire Part 2:** measured job satisfaction. For twenty-nine items the participants were asked to rate their level of satisfaction in eight areas (factors), characterizing their work arrangements and environment: pay and promotion, autonomy, health and safety, professional status, workload, professional development, organization policies, and relationships with co-workers and leaders. The questions were distributed randomly in the questionnaire.

**Questionnaire Part 2:** measured experienced job stress in the six areas adapted from the Nurse Stress Index (NSI) <sup>(39)</sup>, which were presented as coping with workload, organizational support, blood sampling, working environment, home/work discordance, and confidence/proficiency at work. Seventeen questions were randomly distributed to be answered on a four-point Likert scale ranging from “not at all stressful” to “extremely stressful.”

The questionnaire was distributed to 539 MLPs working in the eight hospitals in Riyadh at KSA. A total of 336 participants returned the survey. The data were analyzed using SPSS version 28.0. Descriptive statistics were performed for demographic data, job satisfaction and stress scale scores which are presented as frequencies, means and standard deviations. The association between job stress and job satisfaction was evaluated by linear regression, considering job stress as the dependent parameter. Analysis of Variance (ANOVA) using job stress as the dependent factor analyzed the job satisfaction factors that showed negative correlations with linear regression, like Professional development, Relationship with co-workers and leaders, and Workload, for significance.

The impact of demographic characteristics and the mean stress value of subjects were analyzed by using Between-Subjects ANOVA. Statistically significant impacts observed between age groups of subjects were then subjected to Post Hoc analysis using Least Significant Difference (LSD) to identify the significant differences between subgroups. The level of statistical significance was set at  $p < 0.05$ .

## Results

A total of 336 participants returned the survey. The overall response rate was 62 %.

### Demographic details of the medical laboratory professionals

**Table (1)** shows that sixty-four percent of the respondents were female (36 % male). The biggest age group was 25–34 years of age and the smallest 54 years and older. Half of the respondents did three-shift work (50.8 %). Seventy-nine percent were married.

### Levels of job satisfaction and job stress

The results are presented in the following order: mean scores of job satisfaction and job stress by different demographic groups (**Table 1**) and by job satisfaction and stress factors (measured by questionnaire items) (**Tables 2 and 3**). Scores for job satisfaction and job stress are divided into ranges. The range 29–67 represents low satisfaction, 68–106 moderate satisfaction, and 107–145 high satisfaction. For job stress, scores 0–16 are defined as no stress, 17–34 very little stress, 35–51 moderate stress, and 52–68 extreme stress <sup>(40)</sup>.

There were significant differences between age ( $p$ -levels $<0.05$ ), gender (0.05, and 0.001 respectively) as shown in **Table 1**. Shift work has an impact on job satisfaction ( $p < 0.05$ ) but not on stress. For marital status, specialty (department), qualification level and designation no significant differences in neither job satisfaction nor job stress were found. The level of stress depends on the age group of MLPs. The pairwise comparisons of the different age groups show that the older staff has significantly lesser stress on average compared to the younger ones ( $p < 0.05$ ).

**Table (2):** For most factors, mean satisfaction scores lay within a range of 0.4; an indication that those factors are of equal importance. The highest level of satisfaction was with the relationships with co-workers and leaders and the perceived professional status. There was less satisfaction with health and safety conditions in the laboratories pay levels and promotion opportunities as well as workload.

**Table (3):** The mean scores of stress factors varied between 1.39 and 2.16 (4 being most stressful), the lowest related to blood sampling and the highest to coping with workload. Overall, those scores indicate a moderate level of stress related to each factor. Consequently, overall high stress levels might be the result of interactions of all factors.

#### The relationship between job stress and job satisfaction

The relationship between job stress (dependent variable) and job satisfaction and its components (independent variables) was studied by multivariate regression analysis. The negative correlation is well illustrated in the scatter plot of **Fig. 1**. The regression model had a good fit with an adjusted R-square of 0.345.

**Table (4):** shows the relative importance of the job satisfaction components as job stressors. The three most important job satisfaction factors, showing statistical significance that correlated to reduced stress among LMPs are: Professional development, relationships with co-workers and leaders, and workload. Those were also the components with highest scores when responders rated job satisfaction. The other satisfaction components were also negatively correlated to stress, although not significantly, with the exception of health and safety. These results indicate the following: For every one unit of increase in satisfaction score for professional development, the stress sum score decreases by 1.2 units, assuming all other variables are held constant. Similarly, for every one unit of increase in score for relationship with coworkers, the stress sum score decreases by 2.1 units, assuming all other variables are held constant. For every one unit of increase in score for workload, stress sum score decreases by 1.8 units, assuming all other variables are held constant.

**Table (1):** Comparison of mean scores and SDs for job stress and job satisfaction by socio-demographic characteristics

Demographic characteristics		Job Satisfaction			Job stress		
		Mean	SD	P value	Mean	SD	P value
Age	<25	95.00	±10.322	<0.05	30.58	±14.969	<0.05
	25–34	91.40	±16.193		30.24	±11.829	
	35–44	97.03	±17.374		26.46	±10.740	
	45–54	104.87	±13.582		23.51	±11.555	
	>54	109.20	±17.126		17.80	±7.084	
Gender	Male	100.45	±15.123	<0.05	24.57	±10.811	0.001
	Female	93.52	±17.327		29.20	±11.942	
Marital status	Single	96.77	±12.774	>0.05	28.17	±11.023	>0.05
	Married	95.85	±17.851		27.49	±12.008	
	Divorced	91.50	±11.269		26.50	±7.594	
Shift Pattern	One shift	93.97	±15.840	<0.05	27.32	±10.651	>0.05
	Two shifts	96.60	±15.455		29.57	±11.904	
	Three shifts	98.04	±17.961		27.09	±12.509	
	Others	87.69	±13.130		32.54	±10.381	
Highest degree	Diploma	92.37	±16.387	>0.05	28.49	±12.018	>0.05
	B.Sc	97.76	±15.994		26.62	±11.573	
	Masters	91.85	±19.320		30.34	±12.333	
	Ph.D	111.00	±8.485		27.50	±2.121	
	Others	98.50	±7.778		21.00	±7.071	
Specialty	Hematology	95.68	±29.46	>0.05	29.46	±11.390	>0.05
	Pathology	96.52	±25.94		25.9	±9.967	

Demographic characteristics		Job Satisfaction			Job stress		
		Mean	SD	P value	Mean	SD	P value
					4		
	Biochemist ry	96.27	±28.66		28.6 6	±13.33 2	
	Microbiolo gy	93.15	±29.28		29.2 8	±11.12 4	
	Genetics	89.00	±23.38		23.3 8	±6.239	
	General medical lab sciences	99.05	±26.38		26.3 8	±13.18 9	
<b>Designati on</b>	Supervisors	92.36	±13.04 0	>0.0 5	34.0 0	±6.618	>0.0 5
	Chief BMS	99.44	±13.29 0		29.8 3	±13.15 6	
	Senior BMS	94.42	±17.98 3		28.7 1	±12.18 0	
	Junior BMS	97.29	±14.98 1		26.3 1	±10.95 1	

**Table (2):** Mean and standard deviation of job satisfaction components

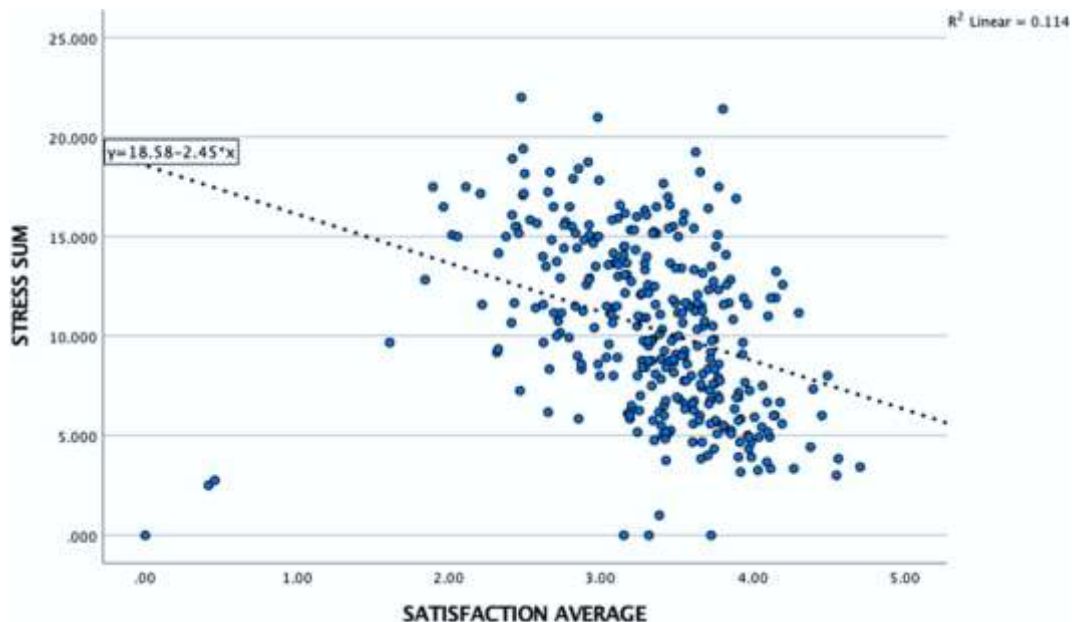
Job satisfaction factors	Mean	SD
Pay and promotion	3.16	.80
Health and safety	2.70	.80
Organization policies	3.44	.70
Professional development	3.54	.82
Autonomy	3.34	.73
Professional status (appreciation and recognition)	3.72	.80
Relationship with coworkers	3.75	.61
Workload	3.25	.72

**Table (3):** Mean and standard deviation of job stress components (adapted from NSI).

Stress factors	Mean	SD
Coping with workload	2.16	1.1
Organizational support	1.52	.95



Blood Sampling	1.39	.74
Working environment	1.78	.96
Home/work discordance	1.63	1.1
Confidence of the proficiency at work	1.92	.86



**Fig. (1):** Correlation between the job stress and job satisfaction of medical laboratory professionals in Omani Hospitals

**Table (4)** Job satisfaction components correlated to stress.

Job satisfaction factors	B t-test	Std. Error t
Pay and promotion	— .48	.36
	— 1.34	.18
Health and safety	.17	.31
	.55	.59
Organization policies	— .65	.43
	— 1.51	.13
Professional development	— 1.24	.34
	— 3.65	.00
Autonomy	— .01	.34
	— .02	.99
Professional status (appreciation & recognition)		— .29
	.38	— .79
	.43	
Relationship with co-workers and leaders	— 2.15	.47
	— 4.62	.00

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The Workload	—1.9	.37
	—5.12	.00

## Discussion

The present study found that there were significant differences in job satisfaction and stress between age groups, and gender. When job dissatisfaction increased higher stress levels were reported. This is in line with what has been found among American biomedical analysts<sup>(41)</sup>. The youngest MLPs were less satisfied at work and more stressed than their older colleagues. One reason might be high expectations that are not met in their laboratory environment in reality. Similar findings are reported from Malaysia, where younger age groups among laboratory staff are more dissatisfied<sup>(35)</sup>.

A recent study showed that Chinese physicians over 41 years of age had higher job satisfaction and lower stress than their younger peers<sup>(30)</sup>. The authors offer as an explanation that work commitment is higher among older and more experienced professionals. The current findings show that males are more satisfied than females and feel less stress at work. Similarly, a study from a hospital reported that female doctors had significantly lower levels of satisfaction and more stress compared to their male colleagues<sup>(42)</sup>.

This observation is in line with the findings of studies that have been conducted in Saudi Arabia among nurses: men had higher job satisfaction scores than women<sup>(43)</sup>. Male and female professionals might have different expectations as to work-life explaining this difference. Another possible explanation is that women have commitments that are more social in family life than men, which might make them less satisfied at work and increase their level of stress. Job dissatisfaction factors catalyze increasing levels of stress at work. That has an effect on the quality of health services, which was shown for healthcare staff including MLPs in Saudi hospitals<sup>(44)</sup>.

The most important job satisfaction factors in the laboratories were, as found in this study, relationships with co-workers and leaders, and professional status (shown as recognition and appreciation). On the other hand, dissatisfaction factors were lacks in health and safety, and slow career progress, as well as heavy workload. Lack of health and safety in the laboratories was also a source of dissatisfaction, corresponding to findings in a study conducted in Malaysia and Iran among MLPs, where inadequate laboratory safety was one of the main sources of dissatisfaction at work<sup>(35)</sup>.

A study in Kenya reported that 49.5 % of laboratory personnel suffered from dangerously placed equipment and chemical hazards in the laboratories, emphasizing the importance of adequate and safe working conditions<sup>(45)</sup>. The most important factor also causing dissatisfaction among MLPs in our study was workload. To have to cope with a heavy workload is an important stress factor. This finding is consistent with the results of a previous study conducted in Saudi Arabia among healthcare workers in primary health care centers<sup>(44)</sup>.

Constructive relationships with co-workers and appreciation shown by management contributed to overall job satisfaction. However, a study from Ethiopia showed that MLPs were more satisfied with relationships at work than other healthcare professionals<sup>(46)</sup>. According to the present study, Herzberg's two-factor theory of motivation appears to be a relevant framework for studies

on job satisfaction among healthcare professionals, including MLPs. In addition, satisfiers and hygiene factors can be used to guide both qualitative and quantitative studies on job satisfaction in healthcare, but factor labels and the descriptions of those should be adjusted to mirror the organizational context.

## **Conclusions**

There is a correlation between job satisfaction and job stress, overall and by factor, among medical laboratory professionals. These findings are corroborated by studies performed elsewhere, especially in the Mid-east and Africa. In many of those countries expatriates form an important part of the workforce, and they are, by and large, more satisfied than residents. More experienced and senior staff shows higher levels of satisfaction also. Gender is also of importance. The most important dissatisfaction factor among MLPs is health and safety in the laboratories. The satisfaction components with highest scores were professional status and relationships with co-workers and leaders.

The most important dissatisfaction factors, leading to job stress, are insufficient support for professional development, poor relations with supervisors and co-workers, as well as heavy workload. This study emphasizes the importance of investing in measures to meet the expectations of laboratory staff, to strengthen factors that increase satisfaction and eliminate dissatisfaction factors. It gives concrete advice on what those measures should be and, consequently, guides actions on improving the work environment in medical laboratories.

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