

Identification of Group Structure among Emergency Medical Technicians Based on Their WHO Quality of Life BREF Questioner: A Two-Step Cluster Analysis.

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Abstract:

Background: Many researchers have studied to find out that, How Quality of life (QoL) is associated with poor quality of services to the working environment. Because working in the health field and heavy workload therefore poor QoL can lead to poor quality of service to patients. Quality of Life is an important index of general and mental health.

Methodology: A cross-sectional study was conducted to measure the quality of life among emergency medical technicians. A group of 100 EMT workers has participated from a total population of the Kancheepuram district. WHO quality of life BREF questions to assess their quality of life during 2021 June and July A two-step cluster analysis was used to group these emergency medical technicians based on their demographic factors like age, gender, marital status, education, experience; quality of life assessed based on WHO BREF 28 questions under four domains physical, social, environmental and psychological.

Results: This shows two clusters in the study. Compare to Cluster 1 high quality of life in Cluster 2. The study participant most a high quality of life with More than 2 years of experience EMTs expect psychological because of many married family issues.

Keywords: *Quality of life, Emergency Medical Technicians, WHO BREF questioner, social, environmental, physical, psychological, two-step cluster analysis.*

Introduction:

Quality of Life is an individual's consciousness of their condition in life and the related of toe culture and rate systems in which the living and relative to their goals, prospects, ethics, and concerns. It is a broad-ranging concept artificial in a complex way to the person's physical health, psychological state, level of freedom, social relationships, personal opinions, and relationship to relevant features of their environment. A WHO (world health organization) BREF guest questionnaire find out the quality of life.

Emergency Medical Technion will work in pre-hospital care for all kinds of emergency trauma, medical al, Emission EMT will play a major ambulances lance and on-site. In some difficult conditions, emergency physicians will guide EMTs for rescue patients. During disaster time EMT is a part of the disaster management team.

2. Material and Method:

2.1 Study Area:

The study was conducted in Tamil Nadu state Kancheepuram district from June to July 2019. There is a total population of 140 people EMT from the Kancheepuram district the GVK EMRI report online.

2.2 Study Design:

A cross-sectional study was conducted to evaluate the level of quality of life among emergency medical technicians. A structured WHO BREF questionnaire about quality of life collected information from EMT work in the Kancheepuram district. Individual verbal consent was obtained from the respondents before the collection of data. The study was approved by the Institutional Review Board approval by a school of public health at SRM University India.

2.3 Data Collection:

A self-administered question for this study was set which consists of two-part; the first part socio demography information about the responders such as; age, gender, marital status, education level, and experienced, and the second consist of WHO BREF questionnaire caveat 26 items under four domain social, environmental, physical, psychological. This questionnaire was designed in English. The average time duration was 15minutes my responder spends with an interviewer. Total population from the study area. The total population of 140 with study inclusion criteria collected was 100 samples.

2.4 Two-step cluster analysis:

The SPSS developed a two-step clustering analysis method. This technique meant to find a large set of data sets. The observation method group two stages. In stage one scans the observations one by one and find any observations added previously formed clusters or otherwise new cluster based on some distance criterion. The function will continue up to all observations that are accommodated in all the clusters. In this stage sub-cluster centres as an observation, they are grouped into the desired number of clusters. Euclidean distance and loglikelihood distance are used as distance measures. The variable continuous type and Log-likelihood distance Euclidean distance are used when variables are of mixed type in calculating log-likelihood, it assumes normal distributions for continuous variables and multinomial distributions for categorical variables and also assumes that the variables are independent of each other, as well as the observations (Banfield and Raftery, 1993). If the desired number of clusters is unknown, this method will find the proper number of clusters automatically in such a way that objects in a group are homogeneous and objects between groups are heterogeneous. This method sees that generally, the observations in one sub-cluster end up in one of the final clusters so that the pre-cluster step may not affect the accuracy of the final clustering. Inaccuracy from the pre-cluster step decreases as the number of sub-clusters from the pre-cluster step increases. Many sub-clusters will slow down the second stage clustering. This procedure selects the number of sub-clusters carefully in such a way that the number is large enough to produce accurate results and small enough to not inhibit performance in the later clustering procedure (Banfield and Raftery, 1993). To determine the optimal number of clusters, this method uses an automatic clustering function like Schwarz's Bayesian Criterion (BIC) for each potential number of clusters, change occur in BIC from the before the current number of clusters, at the same time ratio of BIC also will change, and the subsequent ratio of those distance measures. The optimal number of clusters is usually associated with the lowest BIC and the largest ratio of distance measures.

2.5 Data Analysis:

Data are analysed through the statistical package for social sciences version 18.0. Descriptive statistics such as means and frequency were the level of social, environmental, physical, and psychological well-being among EMT workers, and a two-step cluster analysis was used to group their EMT worker WHO BREF 26 items scores.

1. Result:

Study participant 101 most of them age group 20-30, almost 72.3% male, and off of my study participant was married during my interview. Majority of my study responders experience 2-3 years around 56.4% and my study responders Undergraduate 79%. Details of auto-clustering from the results does that BIC coefficient is lowest (1184.743) and the ratio of distance is the largest (1.555) for two clusters, which establishes that the optimal numbers of clusters are two clusters for data sets. Cluster distribution is the first cluster consists of (56) workers, 25 years of age, all of them unmarried, and completed their undergraduate, on the average 1-2 years' experience. Sec clusters (45) workers, 31 years of age, all of them married and completed undergraduate, more than two years of experience physical score, social score, environmental score all more in the clusters two except physiological score. Cluster 1 comper to cluster 2 more in the physiological score, because cluster 2 all of them married so family commitment may be a reason.

Table 1: Demographic characteristics of the respondents

Characteristics	Demographic characteristics	Number (%)
Age	<20	2 (2%)
	20-30	77 (75.5%)
	30-40	20 (19.6%)
	>40	2 (2%)
Gender	Male	73 (72.3%)
	female	28 (27.7%)
Marital status	Married	51 (50.5%)
	Single	50 (49.5)
Education	Undergraduate	79 (78.2%)
	Postgraduate	22 (21.8%)
Experience	<1 year	17 (17.9%)
	1-2 years	26 (25.7%)
	2-3 years	57 (56.4%)
	>3 years	1 (1%)

Table 2: Detail of auto clustering

Number of clusters	Schwarz's Bayesian criterion (BIC)	BIC change	The ratio of BIC changes	The ratio of distance measures
1	1184.743	0	0	0
2	1176.156	-8.584	1	1.266
3	1196.522	20.362	-2.372	1.525
4	1254.364	57.842	-6.738	1.078
5	1317.367	83.003	-7.34	1.555
6	1404.011	86.844	-10.094	1.15
7	1496.196	92.185	-10.739	1.173
8	1593.836	97.64	-11.375	1.124
9	1894.965	101.129	-11.781	1.078
10	1798.133	103.167	-12.019	1.09
11	1903.455	105.312	-12.269	1.078
12	2010.477	107.032	-12.469	1.058
13	2118.733	108.256	-12.611	1.032
14	2227.644	108.911	-12.688	1.18
15	2339.66	112.016	-13.05	1.006

Table 3: The Cluster Distribution of All the Variables.

Variables	CLUSTER1	CLUSTER2
Number	56	45
Physical	53.27	55.33
Physiological	59.89	58.73
Social	51.41	63.56
Environmental	53.95	58.09
Age	25.05	31.09
Experience	1-2 years	More than 2 years
Marital status	2	1
Gender	1	1
Education	1	1

4. Discussion:

The study is to identify the group structures among emergency medical technicians based on their WHO quality of life BREF questionnaire: A two-step cluster analysis. The physical score, social score, environmental score, physiology score, age of the workers, experience in the EMT field, and educational qualification are used to classify the EMT professional using a two-step cluster analysis. In EMT professional Tamil Nadu, there is no clear division of slaughtering section, The Study finding revealed that the majority of the EMT professional (77%) age group between 20-30 years, (72.3%) male population, (50.5%) study responder married, (78.2%) completed undergraduate. out of 101 responders involved in this study (56.4%) had 2-3 years of experience, (25.7%) had 1-2 years of experience, (17.9%) < 1 year of experience, and 1% >3 years of experience. Two-step cluster analysis shows two important clusters that we identify based on BIC coefficient and ratio distance. The first cluster consists of 56 EMT professionals with an average age of 25 years of age, all of them are unmarried and completed undergraduate. Cluster two members completed their undergraduate, they have more than 2 years of experience, and all are married men. All the above-mentioned factors are important differentiating in this cluster from the rest. Clusters members show their education level, Physical score, social score, environmental score, and physiology scores. Any organization or management will be benefited if it retains this type of job for EMT professionals to give physiology support or stress management. How to overcome the physiology problem either family or workplace train them to come out of that. EMT professionals who have lesser than 2 years of experience train different cases in casualty itself otherwise under seiner's staff up good exposures.

5. Conclusion:

A two-step cluster analysis was done for Quality of life in Emergency medical technicians who all have more than two years of experience compared to those with less than two years of experience in EMT professionals who have a high quality of life. At the same time compared to the married and unmarried physiology less in married EMT professionals. This study suggests giving up to two years of experience in EMT different cases handling with senior EMT professionals and teamwork in the casualty itself. Married EMT professionals guide them on how to overcome physiology issues family and other problems.

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