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Perceived Quality of Life among Health Personnel: The Vitamin Model Analogy

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Abstract

Purpose: Perceived quality of life has partly been based on the evaluation of people’s major categories of fundamental life needs. It have been observed that people’s perception of their position in life in the context of the culture and value systems in which they live, as relates to their goals, expectations, standards, and concerns, is their perceived quality of life. The Vitamin model elucidates the analogy of the physiological relationship between vitamins and health thereby explaining how psychological vitamins affect perceived quality of life, based on the work environment, cultural determinism, and person-environment in this case. The need to evaluate how health personnel’s perceived quality of life would affect their productivity and the effect on the overall quality of life is apt.

Methods: The study was cross-sectional research with 346 participants, who were selected by stratified random sampling, as the study sample. The assessment tool was the Health Personnel Perceived Quality of Life Scale which measures how healthcare professionals perceived their quality of life in relation to job demand and performance. Principal component analysis and multiple regressions were used, based on p≤0.05.

Results: Age (F(4,3694)=0.01), marital status (F(19,3678)=0.03); and ethnicity (F(2,3696)=0.01) had significant influence on perceived quality of life among health personnel. However, gender (F(5,3693)=0.59) and professional affiliation (F(6,3692)=0.62) were not significant.

Conclusion: The study concluded that quality of life perception among health personnel is influenced by their age level, marital status, and ethnicity, as mediated and or work environment, cultural determinism, and person-environment. Hence, the vitamin model analogy indicates a cogent need for the improved work environment, cultural determinism, and person-environment to ensure an improved quality of life. There is a need for more empirical studies, using the vitamin model analogy, towards improving the health personnel’s perceived quality of life.

Key words: Vitamin model; Quality of life; Perceived quality of life; Health personnel; Healthcare professionals

Introduction

There has been perceived need for integrative elucidation of the analysis of the quality of life construct and the vitamin model analogy to facilitate effective understanding of health personnel perceived quality of life. Thus, understanding the concepts “quality of life” and “vitamin model” would illustratively provide the premise for empirical study on perceived quality of life among health personnel based on vitamin model analogy [7]. The analogy of vitamin model, by inference in this context, considers work environment, person-environment, and cultural determinism as critical factors.
Quality of life

Quality of life is a multidimensional construct which means a different thing to different people, or mean different things to the same person in different situations or times. Rapley [17] quoted literature suggesting quality of life as one of the most inconsistently used terms within the human sciences. Cummins [4] attributed coinage of the conceptual nomenclature “quality of life” in its modern form as being a characteristic of persons and as an indication of national prosperity. That means, progress on social goals would be measured by quality of the kind of life that people live and not only based on the size of the balances of their respective bank accounts. Noll [15] supported this by pointing to the evolution of two contrary quality of life conceptualizations, i.e. the objective perspective which originated from Scandinavian view and the subjective perspective which originated from American view. Scholars, especially [11], further argued to the affirmative that the “quality” of any entity whatsoever has a subjectively perceptual dimension as well as an objectively tangible reality.

Quality of life definition by [26] emphasizes the individual’s perception of their position in life as relates to the culture and value systems within which they live, in consonance with their concerns, expectations and goals. Quality of life encompasses basic conditions of life such as adequate food, shelter, and safety, and life-enrichers [14]. Hence Matsumoto [12] defines it as the degree to which a person is able to enjoy being alive in relation to physical and emotional health, economic sufficiency, social engagement, and the capacity to make decisions for oneself.

Health personnel refer to workers who are engaged in professional decisions and corresponding actions with the primary intent of preventing and curing diseases towards improving health [27]. These workers include Medical Doctors, Nurses, Medical Laboratory Scientists, Pharmacists, Medical Rehabilitation Practitioners, Psychologists and Social Workers, with their respective professional specializations and job descriptions. Healthcare service is a source of stress, associated with burnout [8].

Vitamin Model

Vitamin Model is a theory, originated by [21], which provides broad approach for looking at how environmental features may influence psychological wellbeing. The analogy of physiological relationship between vitamins and health premised the vitamin model which poses to explain how psychological vitamins affect perceived quality of life. Warr [21] believes that just as the deficiencies and high intakes of certain vitamins affect human health negatively, so also the lack and excesses of certain environmental features as psychological vitamins (in workplace) affect personnel quality of life negatively. This aspect of the vitamins analogy premised on the fact that both undernutrition and over-nutrition are types of malnutrition with attendant consequences of ill-health.

Warr [23] reasoned that wellbeing and sources of happiness are at times differentiated by their primary emphasis. The primary emphasis perspectives among employees hinged on features in the setting within which they operate (i.e. work environment) and their thoughts and feelings (i.e. person-environment) as mediated by cultural determinism. Happiness and unhappiness are products of combined work environment and person-environment anchored on environment-centered and person-centered frameworks [21; 23]. The wellbeing and happiness described by Warr [23] are today more popularly referred as perceived quality of life.

In the propounded “vitamin model”, the proponent lamented that vitamins such as A and D (though essential for health) when consumed in large quantities are harmful. This is because vitamin A overdose have adverse effects
which include loss of appetite, nausea, headache, fatigue, dizziness, dry skin, desquamation (loss of skin) and cerebral edema; while vitamin D overdose leads to a built-up of calcium in blood (hypercalcemia) followed by poor appetite, loss of weight, vomiting (or constipation), frequent urination, extreme thirst, muscle weakness, kidney stones, and disorientation. Yet other vitamins such as C and E (also essential to health) can be consumed in large quantities without any ill-effects. This could be because it’s normally very rare to experience and or manifest any side effect of vitamin C overdose or a clear side effect of vitamin E overdose in any case.

Warr [21] described environmental features in terms of vitamins such that the presence of each feature (within the environment) is important for psychological wellbeing, but their effects vary depending on the level, situation, individual, and other factors. Certain environmental features are desirable at moderate levels but harmful at high levels, due to “too much of a good thing” effect and or other factors [23]. The work psychologist identified 12 principal characteristics (of a job) that are associated with employee happiness or unhappiness [21; 22]. These include “opportunity for personal control, opportunity for skills use and acquisition, externally-generated goals, variety, environmental clarity, contact with others, availability of money, physical security, valued social position, supportive supervision, career outlook, and equity” [22].

A psychologically-good-job scores very well on the aforementioned characteristic features, in addition to adequate income [23]. All the psychosocial factors and environmental features, if provided as a balanced diet, are essential for wellbeing and psychological health. However some of these psychosocial factors and environmental features, “such as externally generated goals (workload) and environmental clarity at high levels are assumed to be harmful to wellbeing. Others include the availability of money and valued social positions which, according to the model, are unlikely to ever be detrimental to wellbeing even at very high levels” [21].

From the 12 earlier suggested primary environmental features, Warr [22] viewed the first 6 features as analogues of vitamins A and D whereas the other 6 as analogues of vitamins C and E. For vitamins A and D, opportunity for personal control and environmental clarity are most common examples. The opportunity for personal control helps in meeting personal goals, sustaining a sense of personal agency, and reducing feeling of helplessness [24]. Likewise, environmental clarity helps reduce anxiety about the future and facilitates planning and regulation of actions [23].

As a theoretical framework, the vitamin model encompasses environment-centered characteristic features (work environment) and culture-centered mediatory features (cultural determinism), as well as the target population characteristic features (demographic factors). Theories elucidated in the study, to explain health personnel perceived quality of life, in relation to vitamin model include theories of work environment [3; 18; 24; 25] and cultural determinism [19]. The vitamin model, in this case, serves the purpose of being a useful reminder about the range of psychosocial factors, including environmental and cultural factors, and their invaluable relationships to wellbeing which may not always be a linear one [24].

**Method**

The study was designed to evaluate the way health personnel perceived their quality of life how that would affect their productivity and the subsequent effect on overall quality of life. It was a cross-sectional research conducted among health professionals at four of the Nigerian tertiary hospitals. A sample consisting of 340 participants, selected by
stratified random sampling, participated in the study. *Health Personnel Perceived Quality of Life Scale*, developed for assessing the *health personnel perceived quality of life* construct [7], was used in data collection. Data analysis used Principal Component Analysis and Multiple Regressions analysis, based on p≤0.05.

**Results**

Principal component analysis with varimax rotation was conducted to assess how variables clustered, based on inspection of component plot rotated space. Results presented on Figure 1 indicated how variables are organized in the common component space and interactively rotated. It can be seen that some variables have been readily organized in the said common component space while others remained component specific. By exploring the plot, we can see that it gives a visual representation of the loadings plotted in a 3-dimensional space. The plot showed how closely related the variables are to each other and to the 3 components.

![Component Plot in Rotated Space](image)

**Figure 1. Component Plot in Rotated Space**

Analysis of the component plot in rotated space was corroborated by results on Table 1 showed no significant quality of life difference between male and female participants [\(F = 0.003, \ p > .05\)]. This suggests that there is no gender difference in the experience(s) of quality of life among the study participants.

In age groups, there was significant difference of quality of life [\(F = 4.207.28, \ p < .05\)]. This means that age differentiated the experience(s) of quality of life of the participants. It will be observed that quality of life is closely the same among the older adults who were 40 years and above (Table 1). The least level of quality of life was expressed among those in the early adulthood: 20 – 39 years. This suggests that increase in age is associated with higher scores of quality of life, but in the middle and late adulthood the increase is almost negligible.
In marital status, there was significant difference of quality of life \(F = 19,681, p < .05\). The mean distribution showed those who are married or once married (divorced or separated) expressed much higher quality of life than those singles (not married at all).

There was also significant difference of quality of life among the ethnic groups \(F = 2,326, p < .05\). Those in the Northern and Southern minority groups as well as Yoruba were closely equal and expressed more quality of life than those in the Hausa and Igbo groups.

The professional distribution of the participants, on the other hand, did not show any significant difference of quality of life \(F = 0.03, p > .05\). However, the professional groups showed varying means and standard deviations respectively, indicating that certain professional groups demonstrated (though not at insignificance level) more perception of quality of life as relates to their being health personnel than other health personnel belonging to different professional groups.

Table 1. HPPQOL Factors as Measured on the Scale

| Variables     | Groups    | Mean   | Std. Deviation | F     | Sig. |
|---------------|-----------|--------|----------------|-------|------|
| Gender        | Male      | 241.64 | 22.66          | 0.00  | 0.96 |
|               | Female    | 241.68 | 22.49          |       |      |
|               | Total     | 241.66 | 22.58          |       |      |
| Age Groups    | 20-29     | 209.34 | 0.93           | 4207.28 | 0.00 |
|               | 30-39     | 220.97 | 20.56          |       |      |
|               | 40-49     | 257.41 | 6.65           |       |      |
|               | 50-59     | 256.35 | 10.06          |       |      |
|               | 60 and above | 257.60 | 0.55          |       |      |
|               | Total     | 241.66 | 22.58          |       |      |
| Marital Status| Single    | 209.35 | 0.90           | 19681.49 | 0.00 |
|               | Married   | 256.49 | 6.65           |       |      |
|               | Divorced  | 257.25 | 0.45           |       |      |
|               | Widowed   | 257.29 | 0.46           |       |      |
|               | Total     | 241.66 | 22.58          |       |      |
| Ethnicity     | Northern minority | 254.56 | 11.67  | 2326.22 | 0.00 |
|               | Hausa     | 212.06 | 11.25          |       |      |
|               | Igbo      | 223.87 | 21.98          |       |      |
|               | Yoruba    | 256.77 | 7.25           |       |      |
|               | Southern minority | 256.58 | 4.45  |       |      |
|               | Total     | 241.66 | 22.58          |       |      |
| Profession    | Medicine  | 241.66 | 22.59          | 0.03  | 1.00 |
|               | Nursing   | 241.67 | 22.73          |       |      |
|               | Med Lab Sciences | 262.03 | 24.64 |       |      |
|               | Pharmacy  | 261.17 | 25.00          |       |      |
|               | Medical Rehab | 261.34 | 23.53 |       |      |
|               | Psychology | 261.28 | 23.57 |       |      |
|               | Social Work | 61.08  | 24.96 |       |      |
|               | Others    | 262.34 | 24.13          |       |      |
|               | Total     | 261.58 | 23.98          |       |      |

Table 2. The Model Fit (i.e. Model Summary Table)

| Model | R    | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|------|----------|-------------------|---------------------------|
| 1     | .870 | .788     | .779              | 6.79098                   |

a. Predictors: age, marital status, ethnicity, gender and professional affiliation
Table 2 presented the model fit, for multiple regression analysis, showing multiple correlation coefficients (R), the coefficient of determination (R²) and the adjusted R² which indicates variability accounted for by the model.

R explains multiple correlation coefficients as one measure of the quality of predicting health personnel perceived quality of life. Table 2 which shows R as 0.870 indicates a good level of prediction. R², being the coefficient of determination, shows the proportion of variance in health personnel perceived quality of life as explained by age, marital status, ethnicity, gender and professional affiliation. It can be seen, on Table 2, that 0.788 as value of R² in this case then means that age, marital status, ethnicity, gender and professional affiliation explain approximately 79% of the health personnel perceived quality of life variability. Table 2 shows the value of adjusted R² (0.779) corroborated this as the R² (0.788) shows variability accounted for by the variables in the model while adjusted R² indicates variability accounted for by the model even after taking into account the number of predictor variables in the model.

Table 3. Statistical Significance (ANOVA Table)

| Model    | Sum of Squares | df | Mean Square | F    | Sig. |
|----------|----------------|----|-------------|------|------|
| Regression | 5297.594      | 5  | 324533.450 | 43.494 | .000* |
| Residual  | 4087.889      | 34 |   3111.507 |
| Total     | 9385.483      | 346|            |

a. Criterion Variable: HPPQOL  
b. Predictors: (Constant), age, marital status, ethnicity, gender and professional affiliation

The F-ratio (43.494) on ANOVA table (Table 3) tests whether the overall regression model is a good fit for the data. As it can be seen, Table 3 shows sum of squares including regression (5297.594) and residual (4087.889). The result, F(5,3693)=43.494, means the regression model is a good fit for the data. It shows that age, marital status, ethnicity, gender and professional affiliation statistically significantly predict health personnel perceived quality of life. Mean square of regression and residual, 324533.450 and 3111.507, on Table 3 does not constitute any regression threat or does not reflect regression to the mean as a challenge in anyway.

Table 4. Estimated Model Coefficients (The Coefficients Table)

| Model | Unstandardized Coefficients | Standardized Coefficients | t | Sig. | 95% Confidence interval for β |
|-------|-----------------------------|---------------------------|---|------|------------------------------|
|       | β                           | Std Error                 | Beta | 14.867 | 0.000  | 96.266 | 200.607 |
| (Constant) | 98.940                        | 7.496 | .187 | .000 | .390 | .052 |
| Age | .176 | .074 | 3.744 | .000 | .187 | .054 | .363 |
| Marital status | .396 | .054 | .788 | .010 | .582 | .399 |
| Ethnicity | .129 | .043 | .363 | .000 | .293 | .065 |
| Gender | 14.309 | 2.455 | .859 | .059 | 11.649 | 16.988 |
| Professional affiliation | 14.418 | 2.577 | .978 | .062 | 11.879 | 17.211 |

The unstandardized coefficients, on Table 4, indicate how much the health personnel perceived quality of life (HPPQOL) varies with each predictor when all other predictors are held constant. To predict HPPQOL from age, marital status, ethnicity, gender and professional affiliation using unstandardized coefficients show that the predicted HPPQOL = 98.94 – (0.176 x age) – (0.396 x marital status) – (0.129 x ethnicity) + (14.309 x gender) + (14.418 x professional affiliation).
Table 4 shows age, marital status and ethnicity with low p-values (.001; .003; .001) respectively while gender and professional affiliation have high p-values (.059; .062) respectively. However, each of gender and professional affiliation has a high p-value (.059; .062) respectively which means gender and professional affiliation are not significant, or did not show any significant influence.

The results also indicated a significant mean (241.66) in categorizing participants on the health personnel perceived quality of life and then significant mean differences were found on the basis of gender and professional affiliation among the participants. Analysis of multiple regressions shows gender and professional affiliation having high p-values (.059; .062) which means that gender and professional affiliation are not significant. This is because a high p-value means the predictor(s) in question have not shown or would not influence the criterion variable in any way. Therefore, it suggests that the question “What could be the influence(s) of gender and professional affiliation on the participants’ perceived quality of life?” would be answered as “both gender and professional affiliation are not significant on quality of life perception among health personnel”.

Age \( (F_{(4,3694)}=0.01) \), marital status \( (F_{(19,3678)}=0.03) \); and ethnicity \( (F_{(2,3696)}=0.01) \) had significant influence on perceived quality of life among health personnel. However, gender \( (F_{(5,3693)}=0.59) \) and professional affiliation \( (F_{(6,3692)}=0.62) \) were not significant.

**Discussion**

The study investigated health personnel perceived quality of life by assessing influence of age, gender, marital status, ethnicity and professional affiliation, based vitamin model analogy. Mean difference was shown in categorizing participants on the health personnel perceived quality of life scale and also significant mean differences among the participant subgroups were observed. It will be observed that the health personnel perceived quality of life seems closely the same among the older adults who were 40 years and above. For example, the least level of quality of life was expressed among those age 20–39 years while high level was expressed among age 40 years and above. This suggests that increase in age is associated with higher scores of quality of life. Since age, marital status and ethnicity show low p-values they support the alternative hypothesis and are therefore significant in this case. However, each of gender and professional affiliation has a high p-value which means gender and professional affiliation are not significant, did not show any influence.

Vitamin model, in this case, serves the purpose of being a useful reminder about the range of psychosocial factors, including environmental and cultural factors, and their invaluable relationships to wellbeing which may not always be
a linear one [24]. As a theoretical framework, the vitamin model encompasses environment-centered characteristic features (work environment) and culture-centered mediatory features (cultural determinism), as well as the target population characteristic features (demographic factors).

Work environment encompasses physical setting (structures and equipment), social processes (vertical/horizontal relationships and job characteristics) and fellow professionals’ attitude (towards teamwork, job descriptions, wages etc) in the workplace. These environmental features seem to have both negative and positive impacts on the workers’ psychological wellbeing [4]. A deeper understanding of such workplace quality of life determinants, according to [24], defines an environment-centered perspective of the worker’s happiness. Some of the work environment theories that lucidly fit this context of “the vitamin model” are the psychological contract [18], affective events theory [25], and two-factor theory [9].

Rousea [18], explaining the vitamins model from viewpoint of psychological contract, described workers belief about what they give to their employer (effort and commitment) and what they expect from the employer (payment and promotion). Individual workers, according to Rousea [18], are highly prone to producing strong negative emotions with long term implications on wellbeing if they perceive any violation (in the contract terms) by their employers. Conversely, when environmental vitamins make the perception of psychological contract as a fair one, then psychological wellbeing (a component of quality of life) is likely to be enhanced [18].

Weiss [25] emphasized specific events at work which leads to specific behavioral and emotional responses, rather than broad job characteristics. These events that actually happened at work, which [21] earlier referred to as nine environmental vitamins, can affect not only the job characteristics but also wellbeing in general [25]. This corroborates the idea of well-sought-for correlation or a balance between employee’s attitude and workplace motivation.

Herberg [9] was interested in a balance that the employee’s attitude and their workplace motivation presents; to help determine what make employees feel either satisfied or dissatisfied with their workplace. He developed a theory (which predates the vitamin model) with clear assumptions on about two different sets of factors, referred to as hygiene factors, which influence employee motivation in the workplace. Herberg [9] used the term ‘hygiene’ in describing these factors because their absence brings dissatisfaction or de-motivation while their presence brings satisfaction or motivation. The factors, which have features synonymous to [21] vitamin model, include “compensation, job security, organizational politics, working conditions, quality of leadership, and then relationships between supervisors, subordinates, and peers”. 
The first part of [9] hygiene factor could be described as extrinsic factors, de-motivators, or factors independent of the work itself. When workplace lacks effective leadership, good interpersonal relationship, relevant working tools, appropriate remunerations etc., you will be unhappy and continuously feel ‘something is missing’ or ‘something is wrong’. In hygiene terms, people experience the same feeling of ‘something is missing’ or ‘something is wrong’ when they could not shower, brush teeth, or wash their dirty clothes. Herberg [10] considered the whole scenario as demotivating aspect of hygiene factor while [9] looked at it as an outright deficiency or lack of required environmental vitamins in association with workplace.

The second part of hygiene factor, i.e. *motivators*, has direct relationship with employee motivation which arises based on intrinsic factors which are conditions dependent on the job itself. These intrinsic factors include remunerations, responsibility, recognition, relevant leadership, achievement, award opportunities, and advancement. While Herberg [9] believed that these hygiene factors makes an employee feel comfortable, secure, and happy, [24] corroborated (from the prism of his vitamin model) by submitting that they can provide both psychological and physiological nourishment (as vitamins) for the good of the employee’s quality of life.

Although researchers admittedly agreed with Warr’s [21] vitamin model and Herberg’s [9] hygiene factor, others believed that the way people experience and express their satisfaction or dissatisfaction depends on their perception [5], instead of just reflecting on their “real-world” situation. This perceived cognition can also sometimes be affected by making relative comparison with others at the same workplace or even at different workplace but the same job description and level. The factors that motivates are those aspects of the job which appeal to the workers to even willingly choose to perform, thereby providing them with or earning themselves job satisfaction [1].

The subjective significance assigned to cultural and personal aspects and the way they are differently evaluated suggests variation between cultures and individuals. The old saying which originated during Aristotelian (384-322 BC) era, “everything we do or do not do; wish or do not wish; and have or do not have has explicit and or implicit relevance to how good or bad we perceive life to be”, is of essence. The way vitamins are perceived as being transmitted via dietary nutrients into the body for physiological use should be the same way environmental features are perceived as being transmitted by cultural determinism for psychosocial life [19]. This has been evidently clear based on the fact that culture shapes human behavior and human social interactions.

Culture, which drives the perception of environmental features (synonymous with vitamins), inoculates education and literacy through ancestral ideas and acceptable traditions been passed down as the people’s heritage [20]. The attitudes, norms and behaviors that are passed down through generations change or adapt thereby indicating that
culture perpetuates itself (or manages to survive) dynamically. Cultural determinism specifically states that the culture in which we are raised determines who we are at emotional and behavioral levels [19].

Ogbonnaya, Ukegbu, Aguwa and Emma-Ekaegbu [16] corroborated Aristotle’s (384BC-322 BC) position that all people want to have a good life, although the good life may vary from culture to culture and even from individual to individual. This suggests that the meaning revolves around the same aspects of a good life is based on cultural interpretation. By implication, the impact of culture mediated environmental features on quality of life is in consonance with the physiological effect of vitamins on health. Improving quality of life perception requires adopting problem-solving roles with corresponding constructive attitudes towards employees [2]. The quality of any human resource(s) depends on quality of their working life [28]. In studying the role of psychological capital on employees, Mortazabi, Yazdi and Amini [13] found the psychological capital of human resource playing most positive role. It was also observed that the factors affecting personnel quality of life also play significant roles in satiating their needs as employees [6].

Conclusion

It seems safe to now conclude that a suitable scale has been developed, with an initial validation, for assessing health personnel perceived quality of life. This study provided suitable and needed scale, with particular reference to Nigeria, and also demonstrated the relevance of assessing health personnel perceived quality of life construct. Earlier studies on perceived quality of life among health personnel relied on other scales that only demonstrated face validity, without the appropriate and required content validity, because those scales were not developed for the health personnel perceived quality of life construct. Hence, the outcomes of the present study have more relevant implications for health personnel perceived quality of life assessments.

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