Measuring The Resemblance On Knowledge And Attitude Of Team Building Activities Amongst Health Workers In Nigeria

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ABSTRACT: This study measured the knowledge and attitude of team building activities amongst health workers in Nigeria. The objective of the study is measuring the resemblance on knowledge and attitude of health workers on team building activities in Nigeria using two states as a case. The source of data was questionnaire administered randomly to a sample of 200 workers at Anambra State and a sample of 305 workers at Enugu State. The statistical tool used in this study was the Mantel test statistic. The findings showed a weak negative resemblance on the knowledge of team building activities among health workers at Anambra State and Enugu State with an association of $-46.71\%$ and a $P$-value of 0.87 which fall’s on the acceptance region of the hypothesis assuming a significance level of 5% ($\alpha = 0.05$). Also, it was observed that there exist a strong positive resemblance on the attitude of team building activities among health workers at Anambra State and Enugu State with an association of 74.65% and a $P$-value of 0.00 which fall’s on the rejection region of the hypothesis assuming a significance level of 5% ($\alpha = 0.05$). We recommend that the management of health in Anambra state should encourage workshops and programme on team building for the benefit of health workers in the state. We also suggest that the management of health in Enugu should organize retraining programme for workers on team building activities to enhance the output and efficiency of the health sector.

Keywords: States, significance level, acceptance region, positive, negative

1 INTRODUCTION

Team processes can be described in terms of seven characteristics: coordination, communication, cohesion, decision making, conflict management, social relationships and performance feedback [1], [2], defined team building as a process by which members of a group diagnose how they work together and plan changes which improve their effectiveness. Team building represents a varied concept for different professional groups with a common agreement that team building is a process aimed at improving the performance of a group. Team building is the process of helping a workgroup become more efficient in accomplishing its tasks and in satisfying the needs of group members. Team building is an intervention conducted in a work unit as an action to deal with a condition(s) seen as needing improvements. Team processes describe subtle aspects of interaction and patterns of organizing that transform input into output. Teams require the right number of members with the appropriate mix and diversity of task and interpersonal skills. A balance between homogeneity and heterogeneity of members’ skills, interests and backgrounds is preferred [3]. Team building is a new concept used in business circles and amongst business executives to stimulate work teams. Its objective is to build team spirit, team synergy or to consolidate teams. Developed at the beginning of the 1980’s in the United States, team building has become the most popular group and leadership training approach in both Europe and North America. The majority of middle and large businesses use this type of activity at one time or another [4]. Homogenous teams are composed of similar individuals who complete tasks efficiently with minimal conflict. In contrast, heterogenous teams incorporate membership diversity and therefore facilitate innovation and problem solving. Healthcare teams are often large, due to norms of professional representation, regardless of contribution to patient care. In the healthcare sector, human resources for health have been defined by the World Health Organization (WHO) as those who promote and preserve health as well as those who diagnose and treat diseases. Also included are health management and support workers who help to make the health system functional but do not provide health services directly. This definition include the medical doctors, nurses, nutritionists, psychologists, social health workers, health record keepers, administrators and the security personnel, among others. [5], defined a team as a collection of individuals who are interdependent in their tasks, who share responsibility for outcomes, who see themselves and who are seen by others as intact social entity embedded in one or larger social system and who manage their relationships across organization borders. Health professionals perception as to whether or not they belong to a team varies as in some cases these professionals see themselves as working in uni-professional teams (for example a nursing team) while others see themselves as inter-professional team working in institutionally based teams such as a stroke team comprised of a range of professionals. [6], defined a team as a group that has a job to do, whether as paid participants or as volunteers. They added that it is a group that has spent some time together, whether in smaller increments over a long period of time, or by spending a weekend or more working together on something. It is a group that achieves cohesiveness; a team’s strength is found in the relationships among the team members. It is a group with a common objective, whose members are very clear about working toward one purpose. It is a group whose members are interdependent. Whereas other groups may recognize the strengths of each member, team members rely on the strengths of each member to accomplish the objective. According to [7], team processes describe subtle aspects of interaction and patterns of organizing that transform input into output in an establishment. This includes communication, coordination, cohesion, decision-making, conflict management, social relationships and performance feedback. [5], explained that the aim of team building is to achieve teamwork and not necessarily collaboration because not all collaboration gives rise to inter-professional teamwork. They added that teamwork is the interaction or relationship of two or more health professionals who work interdependently to provide care for patients. Teamwork means members of the team are mutually dependent, see themselves as working collaboratively to provide patient care, share information which may lead to
shared-decision making and know when teamwork should be used to optimize patient-centered care. Speaking on the impact of inter-professional teambuilding, [8], noted that attitudes of undergraduate’s health profession post-course evaluation after 4 years showed that 61% of the participants rated the course to be very beneficial. They also added that ratings of contacts among participants was high immediately after training and declined over the four years period. [9], in their contribution on knowledge and attitudes towards the healthcare team reported that their exist a significant differences in knowledge areas with increase in awareness of community agencies that provide healthcare services, increase in awareness of the skills and strengths of other healthcare team members and increase in the amount of experience working with other healthcare professionals. [10], using qualitative analysis observed that majority of the primary care organizations in England and Wales identified the need to develop a strategic approach of inter-professional teamwork, to meet educational needs of primary care professionals, for fruitful alignment of objectives to be rewarding for participants. [1], noted that the ability to trust originates from self-knowledge and competence. Trust must be slowly built up across team members who have different competencies, assumptions and priorities, through developing confidence in each other’s competence and reliability. Trusting individuals are willing to share their knowledge and skills without fear of being diminished or exploited. They added that self-knowledge and an ability to trust others are the building blocks of commitment. Commitment to a unified set of team goals and values provides direction and motivation for individual members. Healthcare teams generate commitment through a shared goal of comprehensive patient care and a common belief that the team is the best way to deliver this coordinated care. Committed individuals are more willing to invest personally in the team, contribute to the decision making and respect the balance of interdependence and collaboration. [11], explained that the problem of poor inter-professional collaboration is seriously threatening the expected outcomes of team building in the healthcare sector as corroborated by a survey of doctors and nurses working in four university teaching hospitals in Southern Nigeria with results that nurse-doctor working relationships were significantly statistically affected by poor social interaction, staff shortages, activist unionism, disregard for ones profession and hospital management and government policies. They added that team building training is the set of tools and methods that form an instructional strategy, which provide team members with the opportunities to practice skills and receive feedback in a rich learning environment. The strategy is dependent on many variables, such as the knowledge, skills and attitudes (KSAs) that need to be trained and the resources available. Regardless of the strategy, team building focuses on the development of a robust instructional method for influencing team processes (such as communication, collaboration and coordination) and outcomes. Team building comes to life when available tools (for example, team task analysis, performance measurement or task simulation and exercises), delivery methods (for example information, demonstration or practice-based) and content (for example KSAs) are combined. Process intervention activities are designed to assist individuals and groups to examine, diagnose, and act upon their behavior and interpersonal relationships. The ideal end results of these activities are improved team attitudes and effectiveness. Team building consists of four components: goal setting, interpersonal relationships, role clarifications and problem-solving [7]. The need for team building among health disciplines is crucial to patient care, team morale and administrative efficiency has been supported in numerous Medicine, Nursing and public health journals ([12], [5]). This study aims to measure the resemblance on knowledge and attitude of team building activities between health workers of Anambra state and Enugu State. Also to address the need for of training of healthcare workers on team building among healthcare workers for quality healthcare to enhance inter-professional team building for effective teamwork in order to contribute in developing formal inter-professional education programme for healthcare workers in Nigeria.

2 MATERIAL AND METHODOLOGY

2.1 Data Collection

The source of data for this study was generated using questionnaire administered randomly to a sample of 200 workers at Nnamdi Azikiwe University Teaching Hospital, Nnewi-Anambra State and a sample of 305 workers at the University of Nigeria Teaching Hospital Enugu Campus and Enugu State University Teaching Hospital. The sample includes workers from departments such as Community Medicine, Internal Medicine, Obstetrics and Gynecology, Surgery, Pediatrics, General Medical practice, Nursing, Pharmacy, Institute of Human Virology of Nigeria, Medical Laboratory, Nutrition and Dietetics, and Administration of the two health facilities.

2.2 Simple Mantel Test

The mantel test is a permutation technique that measures the resemblance between two proximity matrices computed about the same object. The matrices must be of the same rank, but not necessarily symmetric, though from practice this is often the case. The Mantel technique was first introduced as a solution to the epidemiological question where interest is on whether case of diseases that occurred close in space also tends to be close on time. [13] explained that multivariate tables of observations are usually condensed into resemblance matrices among any sampling unit of interest computed using proximity measure; in this present study the canonical measure was used as a measure as was displayed by the DA (distance over objects of group A) and DB (distance over objects of group B). Hence, the technique was used to compare matrix of spatial distances in a generalized regression approach by [14]. Since [15], the Mantel test has always included any conceivable proximity matrices ([16]; [17]; [18]; [19]. Letting $dA_{ij}$ and $dB_{ij}$ represent the distance observational units $i$ and $j$ as derived from the observations for variables $A$ and $B$, where, $DA = \left( dA_{ij} \right)$ and $DB = \left( dB_{ij} \right)$ denote the corresponding $n \times n$ distance matrices. The normalized Mantel statistic, defined as the product – moment coefficient between distance matrices $DA$ and $DB$, is.
\begin{align*}
\rho_M(AB) &= \frac{\sum (d_{ij} - \bar{d}_A)(d_{ij} - \bar{d}_B)}{\sqrt{\sum (d_{ij} - \bar{d}_A)^2 \sum (d_{ij} - \bar{d}_B)^2}}
\end{align*}

(1)

Where \(\sum \sum\) denotes the double summation over \(i\) and \(j\) which ranges from one to \(n\) and \(i < j\) by symmetry of \(D_A\) and \(D_B\), and \(\bar{d}_A\) and \(\bar{d}_B\) are means of distances derived from the \(A\) and \(B\) raw data respectively. The testing procedure is given as stated by [3]:

1. Considering two symmetric resemblance matrices (similarities) \(A\) and \(B\), of size \((n \times n)\), whose rows and columns correspond to the same set of objects. Compute the Pearson correlation (alternatively, the spearman correlation) between the corresponding objects of the upper-triangular (or lower-triangular) portions of these matrices, obtaining the mantel correlation (often called the standardized Mantel statistic) \(\rho_M(AB)\), which will be used as the reference value in test.

2. Permute at random the rows and corresponding columns of one of the matrices, say \(A\), obtaining a permuted matrix \(A^*\). This procedure is called ‘matrix permutation’.

3. Compute the standardized Mantel statistic \(\rho_M(A^*B)\) between matrices \(A^*\) and \(B\), obtaining a value \(\rho_M^*\) of the test statistic under permutation.

4. Repeat steps 2 and 3 a large number of times to obtain the distribution of \(\rho_M^*\) under permutation; then, add the reference value \(\rho_M(AB)\) to the distribution.

5. For a one – tailed test involving the upper tail (i.e., \(H_1\): distances in matrices \(A\) and \(B\) are positively correlated), calculate the probability (p – value) as the proportion of values \(\rho_M^*\) greater than or equal to \(\rho_M(AB)\). For a test in the lower tail, the probability is the proportion of values \(\rho_M^*\) smaller than or equal to \(\rho_M(AB)\).

Note that for symmetric distance matrices, only the upper (or lower) triangular portions are used in the calculations while for non symmetric matrices, the upper and lower triangular portions are included. The main diagonal elements need not be included in the calculation, but their inclusion does not change the p-value of the test statistic.

2.3 Data presentation (See Appendix for Table 1, Table 2, Table 3 and Table 4)

3 DATA ANALYSIS AND RESULT

3.1 Mantel Analysis on Knowledge of Team Building

Research Hypothesis is stated as

\(H_0:\) There is no significant resemblance on the knowledge of team building activities amongst health workers in Anambra State and Enugu State

\(H_1:\) There is significant resemblance on the knowledge of team building activities amongst health workers in Anambra State and Enugu State

Inputting the data in Table 1 and Table 3 on R 2.13.0 command window, ([17], [18], [19], [20]), where AgreeAnambra, UndecidedAnambra, DisagreeAnambra, and NotapplicableAnambra are objects of matrix Anambra; these are responses obtained from Anambra State workers on knowledge of team building activities (see Table 1) while AgreeEnugu, UndecidedEnugu, DisagreeEnugu, and NotapplicableEnugu are objects of matrix Enugu; these are responses obtained from workers of Enugu State on knowledge of team building activities (see Table 3).

\[
R > \text{AgreeAnambra}=c(30, 25, 31)
\]
\[
R > \text{UndecidedAnambra}=c(120, 150, 119)
\]
\[
R > \text{DisagreeAnambra}=c(0, 0, 0)
\]
\[
R > \text{NotApplicableAnambra}=c(50, 25, 50)
\]
\[
R > \text{AgreeEnugu}=c(250, 291, 250)
\]
\[
R > \text{UndecidedEnugu}=c(20, 9, 50)
\]
\[
R > \text{DisagreeEnugu}=c(0, 2, 1)
\]
\[
R > \text{NotApplicableEnugu}=c(5, 3, 4)
\]

\[
R > \text{Anambra}=\text{matrix}(c(\text{AgreeAnambra, UndecidedAnambra, DisagreeAnambra, NotApplicableAnambra}), \text{nrow}=4, \text{byrow}=\text{TRUE})
\]
\[
R > \text{Enugu}=\text{matrix}(\text{AgreeEnugu, UndecidedEnugu, DisagreeEnugu, NotApplicableEnugu}), \text{nrow}=4, \text{byrow}=\text{TRUE})
\]

Below is the elements of distance matrices DAnambra and DEnugu which contains objects of matrix Anambra and matrix Enugu respectively, on a class distances based on the canonical measure (method =1).

\[
R > \text{DAnambra}=\text{dist.quant(Anambra, method = 1)}
\]
\[
R > \text{DEnugu}=\text{dist.quant(Enugu, method=1)}
\]
The mantel.rtest function was used to perform the mantel test for 10000 permutations, where “nrept” represents the number of permutations;

\[ R > \text{mantel.rtest}(D_{\text{Anambra}}, D_{\text{Enugu}}, \text{nrepet} = 10000) \]

Monte-Carlo test

Observation: -0.4671442

Call: mantel.rtest(m1 = D_{\text{Anambra}}, m2 = D_{\text{Enugu}}, \text{nrepet} = 10000)

Based on 10000 replicates

Simulated p-value: 0.8745125

**Interpretation**

The result obtained, expressed that there exist a weak negative resemblance on the knowledge of team building activities among health workers at Anambra State and Enugu State with an association of -46.71% which on the mantel.rtest function result was indicated as observation = -0.4671 and a P-value of 0.87 which fall’s on the acceptance region of the hypothesis assuming a significance level of 5% (\( \alpha = 0.05 \)); this implies that there is no significant resemblance on the knowledge of team building activities in the health section of the two states. Hence, the null hypothesis was accepted since p-value = 0.87 is greater than \( \alpha=0.05 \) assuming a 95% confidence interval level.

### 3.2 Mantel Analysis on Attitude of Team Building

Research Hypothesis is stated as

\( H_{H2}: \) There is no significant resemblance on the Attitude of team building activities amongst health workers in Anambra and Enugu State

\( H_{H2}: \) There is significant resemblance on the Attitude of team building activities amongst health workers in Anambra and Enugu State Inputing the data in Table 2 and Table 4 on R 2.13.0 command window, ([17], [18], [19], [20]), where AgreeAnambra, UndecidedAnambra, DisagreeAnambra, and NotApplicableAnambra are objects of matrix Anambra; these are responses obtained from Anambra State workers on attitude of team building activities (see Table 2) while AgreeEnugu, UndecidedEnugu, DisagreeEnugu, and NotapplicableEnugu are objects of matrix Enugu; these are responses obtained from workers of Enugu State on attitude of team building activities (see Table 4).

\[ \begin{align*}
R > \text{AgreeAnambra} &= c(20, 127, 120) \\
R > \text{UndecidedAnambra} &= c(130, 43, 50) \\
R > \text{DisagreeAnambra} &= c(0, 0, 0) \\
R > \text{NotApplicableAnambra} &= c(50, 30, 30) \\
R > \text{AgreeEnugu} &= c(275, 292, 294) \\
R > \text{UndecidedEnugu} &= c(30, 8, 6)
\end{align*} \]

\[ R > \text{DisagreeEnugu} = c(0, 0, 1) \]

\[ R > \text{NotApplicableEnugu} = c(5, 5, 4) \]

\[ R > \text{Anambra} = \text{matrix}(c(\text{AgreeAnambra}, \text{UndecidedAnambra}, \text{DisagreeAnambra}, \text{NotApplicableAnambra}), \text{nrow}=4, \text{byrow}=\text{TRUE}) \]

\[ R > \text{Enugu} = \text{matrix}(c(\text{AgreeEnugu}, \text{UndecidedEnugu}, \text{DisagreeEnugu}, \text{NotApplicableEnugu}), \text{nrow}=4, \text{byrow}=\text{TRUE}) \]

Below is the elements of distance matrices DAnambra and DEnugu which contains objects of matrix Anambra and matrix Enugu respectively, on a class distances based on the canonical measure (method =1).

\[ \begin{align*}
R > \text{DAnambra} &= \text{dist.quant}(\text{Anambra}, \text{method} = 1) \\
R > \text{DEnugu} &= \text{dist.quant}(\text{Enugu}, \text{method} = 1)
\end{align*} \]

The mantel.rtest function was used to perform the mantel test for 10000 permutations, where “nrept” represents the number of permutations;

\[ R > \text{mantel.rtest}(D_{\text{Anambra}}, D_{\text{Enugu}}, \text{nrepet} = 10000) \]

Monte-Carlo test

Observation: 0.7465252

Call: mantel.rtest(m1 = D_{\text{Anambra}}, m2 = D_{\text{Enugu}}, \text{nrepet} = 10000)

Based on 10000 replicates

Simulated p-value: 9.999e-05

**Interpretation**

The result obtained, showed that there exist a strong positive resemblance on the attitude of team building activities among health workers at Anambra State and Enugu State with an association of 74.65% which on the mantel.rtest function result was indicated as observation = 0.7465 and a P-value of 0.00 which fall’s on the rejection region of the hypothesis assuming a significance level of 5% (\( \alpha = 0.05 \)); this implies that there is significant resemblance on the attitude of team building activities in the health section of the two states. Hence, the null hypothesis was reject since p-value = 0.00 is less than \( \alpha=0.05 \) assuming a 95% confidence interval level.

**4 DISCUSSION**

The result of the analysis showed that there exist a weak negative resemblance on the knowledge of team building activities among health workers at Anambra State and Enugu State with an association of -46.71% with a P-value of 0.87 which fall’s on the acceptance region of the hypothesis assuming a significance level of 5% (\( \alpha = 0.05 \)). Also, it was observed that there exist a strong positive resemblance on the attitude of team building activities among health workers at Anambra State and Enugu State with an association of 74.65 with a P-value of 0.00 which fall’s on the rejection region of the hypothesis assuming a significance level of 5% (\( \alpha = 0.05 \)); this implies that there is significant resemblance on the attitude of
team building activities in the health section of the two states.

5 CONCLUSIONS
This study measured the knowledge and attitude of team building activities amongst health workers at Anambra state and Enugu state. The findings showed a weak negative resemblance on the knowledge of team building activities among health workers at Anambra State and Enugu State. Also, the existence of a strong positive resemblance on the attitude of team building activities among health workers at Anambra State and Enugu State was observed. Equally, a significant resemblance on the attitude of team building activities in the health section of the two states was found; this result validates the observation of workers in Anambra state having poor attitude on team building activities on like workers of Enugu state who are familiar with team building activities. We recommend that the management of health in Anambra state should encourage workshops and programme on team building for the benefit of health workers in the state. We also suggest that the management of health in Enugu should organize retraining programme for workers on team building activities to enhance the output and efficiency of the health sector.

REFERENCES


Appendix

Table 1: Responses on knowledge of Team Building from Workers in Anambra State

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Question</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team building could be defined as the process of helping a work group becomes more efficient in accomplishing its tasks and in satisfying the needs of the group members</td>
<td>30</td>
<td>120</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Inter-professional team building means purposeful activities bringing members of different professionals / departments together as a team</td>
<td>25</td>
<td>150</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>3</td>
<td>The following Case /care management, Clinical knowledge, Management knowledge Organizational goals and strategies, Organizational politics, Roles of team members, Self-awareness, Team development, Understanding of individual persons, are the knowledge competencies that a member of inter-professional healthcare team</td>
<td>31</td>
<td>119</td>
<td>0</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 2: Responses on Attitude on Team Building activities from Workers in Anambra State

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Question</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team building events and activities will benefit your department/organization</td>
<td>20</td>
<td>130</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>You will participate in an inter-professional team building activities/training if you have an opportunity</td>
<td>127</td>
<td>43</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>You will recommend inter-professional team building activities/training to your department's professionals to improve working/interpersonal relationships with professionals of other departments</td>
<td>120</td>
<td>50</td>
<td>0</td>
<td>30</td>
</tr>
</tbody>
</table>

Table 3: Responses on knowledge of Team Building from Workers in Enugu State

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Question</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team building could be defined as the process of helping a work group becomes more efficient in accomplishing its tasks and in satisfying the needs of the group members</td>
<td>280</td>
<td>20</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>Inter-professional team building means purposeful activities bringing members of different professionals / departments together as a team</td>
<td>291</td>
<td>9</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>
The following Case /care management, Clinical knowledge, Management knowledge Organizational goals and strategies, Organizational politics, Roles of team members, Self-awareness, Team development, Understanding of individual persons, are the knowledge competencies that a member of inter-professional healthcare team should possess to be effective.

<table>
<thead>
<tr>
<th>S/No.</th>
<th>Question</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Team building events and activities will benefit your department/organization</td>
<td>275</td>
<td>30</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>you will participate in an inter-professional team building activities/training if you have an opportunity</td>
<td>292</td>
<td>8</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>You will recommend inter-professional team building activities/training to your department’s professionals to improve working/interpersonal relationships with professionals of other departments</td>
<td>294</td>
<td>6</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

**Table 4:** Responses on Attitude on Team Building activities from Workers in Enugu State