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<td>neurology.northwestern.edu/faculty/deng.html</td>
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Investigating the Facets of Physical Activity Related to Schoolbag Carriage- Highlighting the Lacunae that Exists

By Ruchira Mukherjee, Rajarshi Chanda, Devashish Sen, Subhashis Sahu & Aparna Mukhopadhyay

Prerania University

Abstract- Schoolbag carriage is the most common physical activity performed among school children. The relevant scientific explorations in this regard, has entailed investigation of consequent pain, muscle activity and related fatigue. General fatigue reportedly alters the sensation of thirst and salivary viscosity. Fatigue, thirst and saliva viscosity is also related to neurological performance and alacrity. Moreover, general fatigue is also reflected in eye muscles and visual processing is an integral part of learning in school children. The purpose of this review is to explore these facets of physical activity in relation to schoolbag carriage and in the process extracting the lacunae that exists in exploring the physical activity schoolbag carriage.

Keywords: schoolbag carriage, saliva viscosity, thirst, cognition, fatigue, critical flicker fusion frequency (CFFF).

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Strictly as per the compliance and regulations of:
Investigating the Facets of Physical Activity Related to Schoolbag Carriage- Highlighting the Lacunae that Exists

Ruchira Mukherjee a, Rajarshi Chanda a, Devashish Sen a, Subhashis Sahu a & Aparna Mukhopadhyay b

Abstract- Schoolbag carriage is the most common physical activity performed among school children. The relevant scientific explorations in this regard, has entailed investigation of consequent pain, muscle activity and related fatigue. General fatigue reportedly alters the sensation of thirst and salivary viscosity. Fatigue, thirst and saliva viscosity is also related to neurological performance and alacrity. Moreover, general fatigue is also reflected in eye muscles and visual processing is an integral part of learning in school children. The purpose of this review is to explore these facets of physical activity in relation to schoolbag carriage and in the process extracting the lacunae that exists in exploring the physical activity schoolbag carriage.

Keywords: schoolbag carriage, saliva viscosity, thirst, cognition, fatigue, critical flicker fusion frequency (CFFF).

1. Introduction

Every school-going child, irrespective of their social standing and/or how sedentary a lifestyle they lead, has the physical activity of schoolbag carriage in common. In India, absence of lockers and a very demanding school curriculum, not only makes the schoolbags very heavy, but also its carriage mandatory. It is of utmost importance to explore all facets and effects of this physical activity, given that all subsequent activities within the school curriculum begins after at least a single bout of schoolbag carriage required to reach the classrooms from home.

The World Health Organization (WHO) defines physical activity as energy expended in any form by the skeletal muscles. Physical activity not only improve one’s overall well-being, but also enhances thinking, learning and judgment skills. Given that these skills are a focal point of school education, this further bolsters the importance of schoolbag carriage. This particular physical activity should therefore be explored not only in terms of skeletal muscle response but also in terms of cognition and motor ability.

The impact of physical activity in its varying intensities have been well documented. Schoolbag carriage can be a moderate or high intensity physical activity based on the amount of load being carried. Intense physical activity is generally characterized with fatigue and schoolbag carriage related fatigue has been previously reported. Overall fatigue can be reflected in eye muscles and be quantified using Critical Flicker Fusion Frequency (CFFF). CFFF is vital for children given that a major portion of school curriculum entails viewing the blackboard or projector screen. Fatigue resultant from schoolbag carriage to reach the school may also interfere with concentration of a child subsequently affecting scholastic performance.

Apart from overall fatigue being reflected in the eye muscles, increased heartbeat, increased thirst and saliva viscosity are also characteristic of physical activity. Increase in sensation of thirst is observed as the intensity of physical activity increases. Increased thirst is delineated to increase saliva viscosity. Reported, thirst and physical activity together cause changes in neurological alacrity. Cognitive and motor performance is seen to be impacted due to fatigue and thirst. Scrutinizing the physical activity of schoolbag carriage is hence incomplete without exploring its effect on thirst, salivary viscosity and cognition.

The effect of physical activity on all the aforementioned factors-fatigue reflected in CFFF, thirst, cognitive and motor performances are inter-related, co-dependent and modulate each other. Given the importance of fatigue on the ability to focus on academic curriculum and the importance of cognition in children, investigating the influence of the physical activity of schoolbag carriage and its intensity on these parameters can be insightful and is topical.

II. Methodology

Numerous papers were reviewed relevant to the topic in hand and arranged into subheads that are included in the scope of this particular review. Some data were not available or were not apparent and unclear, such studies were excluded.
1. Physical Activity Intensity and Fatigue

Physical activity is beneficial to a certain extent but excess causes fatigue, which is detrimental. Fatigue can be considered as a marker for physical activity. A study conducted by Torbjörn et al. in 2002 on 58115 participants show that there is an increase in degree of fatigue as the workload increased. Another 2005 study by Jarrod D Presland et al., validated the finding of the previous study observing considerable central fatigue after prolonged physical activity. A relatively recent study in 2017 by Smith et al., reported strong positive correlation between workload and fatigue in railway workers. When it comes to the workload of schoolbag carriage, a study reported carrying 12% load of bodyweight to be moderate intensity while carrying 16% load of bodyweight to be a high intensity physical activity. So, with increase in bag weight, the resultant fatigue might increase. Heavy backpack carriage among children is reportedly common which is seen in most of the literature associated with physiological effects of school bag carriage.

a. Fatigue in load bearing muscles

Heavy backpacks entail the use of load bearing muscles activated during any kind of physical work associated with the upper and lower torso- Rectus Abdominis and Lumbar Erector. Rectus Abdominis works with other abdominal muscles to control the pelvic tilt and plays a significant role in core stability. The erector spinae (lumbar, thoracic, and cervical regions) facilitates head and back extensions by bilateral contraction, controls the thoracic flexion and provides core strength. A multitude of reports about back pain associated with heavy backpack carriage in children further bolsters the importance of this muscle.

A study by Mosaad and colleagues explored the effect of load carriage on the trapezius muscle of 30 school going children (mean age -13.66years). Muscle activity was observed in 3 separate instances, one when the children had no load to carry, in the other two the kids were asked to carry an ordinary backpack and an ergonomically designed double sided pack. It was observed that the muscle activation was significantly less when the kids were carrying the ergonomically designed pack.
designed backpack than the regular backpack20. Another study was conducted by Motmans et al., on 19 participants on different modes of bag carriage, as a backpack, front pack, shoulder bag and double pack. Electromyogram (EEG) readings of rectus abdominis and spiniae erector were observed during each mode of carriage twice, once with no load and with 15% load of body weight of the individual. The results showed a significant decrease in load carriage as a backpack but increased when it was carried as a shoulder bag and front pack. Rectus abdominis showed increased activation during backpack mode of carriage. There was a significant asymmetry in back and abdominal muscles during shoulder carriage. The study also suggested that asymmetrical load carriage might cause a decrease in trunk stability which might lead to back pain21.

b. Fatigue in ocular muscles

Overall fatigue can also be seen in the ocular muscles22. Critical Flicker Fusion Frequency (CFFF) is used to measure the ocular fatigue which representative of overall fatigue7. Eye conditions can affect scholastic performance by not only reducing concentration but also by interfering with the ability to read, learn and play23. A recent study conducted among school children in Karnataka, India implied higher CFFF thresholds to improve cognition and boost academic performance24. Reports regarding schoolbag carriage and its effect on CFFF weren’t observed after extensive literature search highlighting the lacunae with respect to exploring this particular physical activity.

The practice of carrying heavy backpacks is common, indicating high intensity physical activity manifesting fatigue which may be reflected in ocular muscles. Vision in children is an important aspect within the school curriculum and CFFF alterations due to schoolbag carriage must be explored. Apart from fatigue, perspiration and thirst are also characteristic of physical activity25.

2. Physical Activity and Thirst

The relationship between physical activity and hydration is extremely important in our day to day activities as hydration status dictates the overall equilibrium of our body26. In 1994, Meyer et al., pointed out that the mild hypo-hydration occurring among children who exercised in the heat had a greater degree of induced thirst and most children drank more fluid than they lost during the exercise session27. Mears et al., in 2016 reported the development of thirst sensation after exercise and its persistence until voluntary water intake among young adults28. Young adults in hypo-hydrated state were also reported to have consumed more than 55% of total fluid loss that manifested in them during the exercise period29. The effect of physical activity on subjective urge to drink water has been heavily documented30 but thirst alterations and hydration status in schoolchildren due to the physical activity of schoolbag carriage remains unexplored.

Given that thirst induces physiological changes31 and decreased dehydration bolsters cognition directly affecting academic performance in children32, this becomes a very important area to delve into. Thirst is primarily accompanied with the change in the saliva concentration. Saliva Viscosity is can be used to measure the physiological thirst33.

3. Physical Activity and Saliva Viscosity

Dawes et al., studied on the effect of physical activity on saliva viscosity. The results revealed increased viscosity and protein content in the saliva immediately post- physical activity34. A similar study was conducted by G. Ljungberget al., on the participants of the Stockholm Marathon in 1990, suggested increased concentration and total protein content in the saliva after running the marathon (Ljungberg et al., 1997). A relatively recent study in 2015 suggested a temporary increase in saliva viscosity right after moderate intensity physical activity25. This finding was bolstered by a study in the following year by Litgenberg et al., validating increased saliva viscosity during and after exercise among the participants36. This aspect of physical activity remains unexplored for schoolbag carriage as indicated by a thorough literature search.

Schoolbag carriage being a physical activity, causes alterations in parasympathetic and sympathetic activity, termed as the Central Command37. Physical activity stimulates the sympathetic nervous system, which controls salivary protein secretion by the alpha and the beta adrenergic neurons via the Superior Cervical Ganglion38. Whereas, parasympathetic activity is seen to decrease with the increase in heart rate39. On cessation of physical activity, the heart rate goes back to normal and the parasympathetic system is reactivated40,41. As the water flux or the salivary water content is dependent on the parasympathetic nervous system, changes in the salivary flow rate due to schoolbag carriage might be observed and remains to be documented. The consequent change in salivary density, protein concentration change due to the stimulation of the sympathetic and parasympathetic system due to schoolbag carriage also remains to be documented.

The dehydrated state and workload alters the cognitive and motor performance42. Saliva viscosity can also influence cognitive and motor performance43.

4. Physical Activity and Neurological Performance

The main aspects of neurological performance considered in case of children related to the topic are cognitive and motor ability. While cognitive functions mainly deal with logical reasoning, motor ability deals with physical abilities. Physical activity also influences both cognitive and motor functions.
a. Physical Activity and Cognitive Performance

The association between physical activity and cognitive ability has been documented in several studies around the world. A study by Hillman et al., in 2008 demonstrated that both human showed a positive effect of aerobic fitness training on multiple aspects of cognition and brain function\textsuperscript{44}. In the following year, Charles et al., explored the association between physical activity and cognitive performance in children. The overall finding of the paper suggested that even a single moderately intense aerobic exercise session was enough to impact the cognitive performance in children\textsuperscript{45}. Similar results were observed in the prior studies done by Jonatan R. Ruiz et al., 2010 and 2011 respectively among adolescents. In the study done in 2010 the results suggested, participants who were engaged in any sort of physical activity had significantly better cognitive performance as opposed to those that were not\textsuperscript{46}. The study in 2011 done by David Martínez-Gómez et al., in Spanish population also showed similar results, the adolescent girls who actively commuted to school were seen to have a positive effect in cognitive performance\textsuperscript{47}. Another comparable study by Erikson et al., in the year 2015, summarized the beneficial effects of physical activity on brain and cognition in growing children. This study conducted in Illinois, portrayed greater duration of physical exercise and higher physical fitness to be associated with better cognitive health and brain functions\textsuperscript{48}. Cognitive and motor performances are interlinked.

b. Influence of Physical Activity and Exercise Intensity on Motor Performance

Motor response is the voluntary and involuntary movement of the muscles of the body in response to external and internal stimuli. Motor performance is the efficiency of execution of such movements. In a study conducted by Rikli et al., in 1986 stated that there was a significant difference in reaction time, flexibility and grip strength in people who played golf than older inactive women\textsuperscript{11}. Another similar study in Denmark in 2012 showed that there was a strong positive correlation between motor performance and physical activity in boys\textsuperscript{49}. Conversely it was also seen that motor difficulties increased as time spent doing any kind of physical activity decreased\textsuperscript{50}. Motor ability and cognitive performance can be measured using ruler drop test and letter cancellation. These two techniques are seen to be used to measure the neurological influence of physical activity\textsuperscript{51,52}.

Extensive literature search revealed a study improving reaction time when carrying low weighing backpacks\textsuperscript{4}. Studies were not found when schoolbag carriage was evaluated in the light of cognitive ability. There is a severe dearth of literature on the schoolbag carriage and neurological performance front and must be explored. Moreover, the neurological performance, namely, motor activity and cognitive ability is seen to be linked to the sensation of thirst\textsuperscript{53}.

5. Neurological Performance and Thirst

Motor and Cognitive ability plays an important role in the learning process of the school children\textsuperscript{54}. These two parameters are affected by a plethora of factors, one of them being thirst. Parsons and others conducted a study in 2000 on adults, concluding thirst to have regulatory effects on cognitive operations involving the prefrontal cortex\textsuperscript{55}. In 2009, Caroline and colleagues indicated that consuming water benefits cognitive performance in children\textsuperscript{42}. Another study done in the same year by D’anci et al., also stated that mild dehydration had a negative influence on mood and cognitive performance in young adults\textsuperscript{42}. Similar to prior studies, Edmond et al., suggested water consumption to be positively correlated to both subjective thirst and cognitive/motor performance in mature and young adults\textsuperscript{53}. A recent study done in 2020 by Goodman et al., on male participants suggested exacerbation of mental fatigue due to thirst\textsuperscript{15}. In a 2018 study by Karthika et al., it was observed that males experiencing increased amounts of stress tend to have increased reaction time which shows the stress delays the processing of neural information\textsuperscript{12}. Thus, thirst and exercise together has significant impact in scholastic performance involving cognitive and motor response.

III. Conclusion

Physical activity of schoolbag carriage affects several physiological functions, factors and responses. Some facets explored in relation to physical activity remain uninvestigated for schoolbag carriage. Some of the factors have been highlighted here-

- Ocular Fatigue
- Thirst
- Saliva Viscosity
- Cognitive Performance
- Motor Performance

The overall fatigue induced by heavy schoolbag carriage may be reflected in ocular muscles. Since vision is very important in following the school curriculum, it is imperative to evaluate the ocular eye fatigue. Physical activity induces higher water utilization, thereby causing dehydration which in turn results in thirst which manifests as increased salivary viscosity. Thirst and physical activity can also modulate certain neurological functions like alacrity, cognitive and motor functions. School students are most vulnerable to this unstructured exposure to excess physical activity. Any physiological damage during developmental or formative years might lead to long term health issues. This field of work should be further explored considering all the parameters at once to get a more accurate representation of the real world scenario and prevent school children from any probable health hazards that
might be caused due to unregulated heavy schoolbag carriage.

**Acknowledgements**

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The literature included in the review are tabulated for an easy referral-

### Physical Activity and Fatigue

<table>
<thead>
<tr>
<th>Authors</th>
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<th>Location of Study</th>
<th>Key Features</th>
<th>Parameters/Tests Performed</th>
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<tr>
<td>(Aaronson et al., 1999)</td>
<td>1999</td>
<td>-</td>
<td>Fatigue cannot be accurately measured using only one parameter; many other seemingly absent parameters also play a significant role in inducing fatigue.</td>
<td>Visual Analog Scale for Fatigue (VASF) 62 Multidimensional Assessment of Fatigue (MAF) 63. Profile of Mood States (POMS). Symptom Distress Scale (SDS) 64.</td>
</tr>
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<td>(Åkerstedt et al., 2002)</td>
<td>2002</td>
<td>Sweden</td>
<td>Work stress, shift work, and physical workload interfere with sleep and are related to fatigue.</td>
<td>Verbal Questionnaire Based.</td>
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<td>(Presland et al., 2005)</td>
<td>2005</td>
<td>New Zealand</td>
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<tr>
<td>(Rosenthal et al., 2008)</td>
<td>2008</td>
<td>Buffalo, New York</td>
<td>One fifth of family medicine patients present with fatigue, and one third of adolescents report having fatigue at least four days per week.</td>
<td>Questionnaire for Sleepiness and Fatigue.</td>
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<td>(Lafère et al., 2010)</td>
<td>2010</td>
<td>-</td>
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<td>Visual Analog Scale (VAS) and CFFF</td>
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<tr>
<td>(Smith &amp; Smith, 2017)</td>
<td>2017</td>
<td>Cardiff, USA</td>
<td>Workload increased fatigue.</td>
<td>Questionnaire</td>
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Parameters of mental fatigue are exacerbated by thirst, and offer novel insight into the relationship between hydration and cognition.

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<tr>
<td>(Goodman &amp; Marino, 2021)</td>
<td>2021</td>
<td>-</td>
<td>Parameters of mental fatigue are exacerbated by thirst, and offer novel insight into the relationship between hydration and cognition.</td>
<td>Urine Specific Gravity (USG) from digital refractometry (PAL-10S ATAGO Japan) Cycle Ergometer Questionnaire Continuous Near-Infrared Spec (fNIRS) Visual Analog Scale (VAS) Stroop Task Inverse Efficiency Score (IES)</td>
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<tr>
<td>(Rikli &amp; Busch, 1986)</td>
<td>1986</td>
<td>Fullerton, California</td>
<td>There were highly significant differences between the golfers and the older inactive women on choice reaction time, sit and reach flexibility, shoulder flexibility, and grip strength. Significant differences beyond the .05 level were found for these same groups on simple reaction time and balance.</td>
<td>Lafayette Company Choice Reaction Time Apparatus Lafayette Hand Dynamometer</td>
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<td>(Edmonds &amp; Burford, 2009)</td>
<td>2009</td>
<td>London</td>
<td>Physical activity was significantly correlated with motor performance in boys, but not girls.</td>
<td>Thirst Questionnaire Story Memory Task Letter Cancellation Spot the Differences VisuoMotor Tasks Water Drinking</td>
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<td>(Morrison et al., 2012)</td>
<td>2012</td>
<td>Denmark</td>
<td>As the brain develops it allows children to monitor tasks and master them. Healthy body activity has a positive correlation with good development which would allow them to adapt to ongoing information processing by updating information, resisting interference, and flexibly switching between task demands.</td>
<td>Actigraph Koordinations Test Für Kinder</td>
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<td>(Roebers et al., 2014)</td>
<td>2014</td>
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<td>Motor difficulty was significantly correlated with less time spent doing physical activity.</td>
<td>Manual Dexterity Scale from the Movement Assessment Battery for Children 2 (M-ABC-2)</td>
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<tr>
<td>(Aprile et al., 2016)</td>
<td>2016</td>
<td>Taiwan</td>
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<td>Manual Dexterity Scale from the Movement Assessment Battery for Children 2 (MABC-2)</td>
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Physical Activity Questionnaire

(Ángel Latorre-Roman et al., 2018)
2018 Chile Ruler Drop Test performance differed between 4- and 5-year-old boys and girls, with girls exhibiting a poorer performance than boys. There were no significant gender differences between the genders for 3-year-olds.

Ruler Drop Test

Physical Activity and Cognitive Ability

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<td>(Charles H. Hillman et al., 2008)</td>
<td>2008</td>
<td>-</td>
<td>The human and non-human animal research discussed above suggests that physical activity, and aerobic fitness training in particular, can have a positive effect on multiple aspects of brain function and cognition.</td>
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<td>(C. H. Hillman et al., 2009)</td>
<td>2009</td>
<td>Illinois</td>
<td>Overall, the findings revealed that a single, acute bout of moderately-intense aerobic exercise facilitated children’s cognitive performance.</td>
<td>Demographics Questionnaire Physical Activity Readiness Questionnaire Education and Socioeconomic Status (SES) Tanner Staging System, Kaufman Brief Intelligence Test (K-BIT), Edinburgh Handedness Inventory, Modified Flanker Task, EEG, EOG Wide Range Achievement Test 3rd edition (WRAT3); Computerized Indirect Calorimetry System (ParvoMedics True Max 2400); Balke Protocol (American College of Sports Medicine, 2006)</td>
</tr>
<tr>
<td>(Ruiz et al., 2010)</td>
<td>2010</td>
<td>Spain</td>
<td>Adolescents engaged in physical sports activities during leisure time had significantly better cognitive performance that those who were not.</td>
<td>SRA-Test of Educational Ability</td>
</tr>
<tr>
<td>(Martínez-Gómez et al., 2011)</td>
<td>2011</td>
<td>Spain</td>
<td>The main findings of this study suggest that actively commuting to school is positively associated with cognitive performance in adolescent girls, independent of potential confounders including extracurricular physical activity.</td>
<td>Transport Questionnaire Spanish version of the SRA Test of Educational Ability</td>
</tr>
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</table>
Greater PA and higher fitness levels are associated with better brain and cognitive health for children and older adults.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Year</th>
<th>Location of Study</th>
<th>Key Features</th>
<th>Parameters/Tests Performed</th>
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<tr>
<td>(Erickson et al., 2015)</td>
<td>2015</td>
<td>Illinois</td>
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<td>(Meyer et al., 1994)</td>
<td>1994</td>
<td>Barrington, Illinois</td>
<td>In conclusion, mild hypohydration in children who exercise in the heat induced an increase in thirst and in the degree of desirability of drinks. During voluntary rehydration, most children drank considerably to overshoot their initial body weight with all drinks.</td>
<td>Thirst and Drink preferences were assessed (analog and category scales).</td>
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<tr>
<td>(Maresh et al., 2004)</td>
<td>2004</td>
<td>Storrs, Connecticut</td>
<td>Primary finding of this study was that the extended period of hypohydration before low-intensity exercise magnified the drive to drink.</td>
<td>Urine Specific Gravity (USG)</td>
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<td>Blood Sample</td>
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<td>Motor-Driven Treadmill</td>
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<td>Thirst Scale</td>
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<td>(Kenefick &amp; Cheuvront, 2012)</td>
<td>2012</td>
<td>-</td>
<td>Exposure to exercise and environmental stress causes intercompartmental fluid shifts, loss of body water and extended delay in fluid replacement by drinking (involuntary dehydration), especially when sweating occurs. Sodium-osmotic and volume-depletion stimuli induce thirst and drinking during and after exercise.</td>
<td>-</td>
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<tr>
<td>(Mears et al., 2016)</td>
<td>2016</td>
<td>Loughborough</td>
<td>The main finding was that sensations of thirst remained until satiated by voluntary water intake.</td>
<td>Electrically Braked Cycle Ergometer (Lode Corival; Lode BV, Groningen, Netherlands)</td>
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<td>Mean Weighted Skin (by Ramanathan)</td>
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<td>Blood Samples</td>
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<tr>
<td>(Brueck et al., 2018)</td>
<td>2018</td>
<td>Fairfield, Connecticut</td>
<td>Exercise intensity is directly proportional to the amount of sweating.</td>
<td>Polymethylsiloxane (PDMS)</td>
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<td>Silicone Elastomer Kit (DowCorning)</td>
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<tr>
<td>(Maresh et al., 2019)</td>
<td>2019</td>
<td>Connecticut, USA</td>
<td>It was observed that within the first 10 min of recovery, participants consumed approximately Sweat Rate Measurement</td>
<td></td>
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</table>
55% of total fluid losses incurred during exercise.

USA
Motorized Treadmill
Thirst [nine-point (1–9) Likert scale]
Blood Sample

<table>
<thead>
<tr>
<th>Authors</th>
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<th>Location of Study</th>
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<tr>
<td>(Dawes, 1981)</td>
<td>1981</td>
<td>-</td>
<td>A striking finding of the present study was the very high protein concentration in the saliva collected from most of the subjects immediately after exercise. The elevated protein concentration after exercise may account for the subjective feeling of increased salivary viscosity which is typically experienced.</td>
<td>Saliva Samples</td>
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<td>(Ljungberg et al., 1997)</td>
<td>1997</td>
<td>Stockholm</td>
<td>The increase in concentration of total protein after the race may be one explanation for the subjective feeling of increased salivary viscosity recorded as the index for dry mouth.</td>
<td>Blood and Saliva Samples Water Intake</td>
</tr>
<tr>
<td>(A. J. M. Ligtenberg et al., 2015)</td>
<td>2015</td>
<td>Amsterdam</td>
<td>During exercise the viscosity of saliva increases.</td>
<td>Saliva Sample</td>
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<tr>
<td>(A. Ligtenberg et al., 2016)</td>
<td>2016</td>
<td>Canada</td>
<td>In conclusion, this study shows that there is a temporary increase in the viscosity of saliva immediately after moderate exercise, which is probably caused by an increase of the MUC5B secretion rate.</td>
<td>Cycle-Ergometer with Handgrip Heart Rate Monitor (Life Fitness upright lifecycle 95C, T-Fitness, Amsterdam, The Netherlands) Saliva Samples Viscometer (Vilastic 3, Vilastic Scientific Inc., Austin, TX, USA),</td>
</tr>
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<tr>
<th>Authors</th>
<th>Year</th>
<th>Location of Study</th>
<th>Key Features</th>
<th>Parameters/Tests Performed</th>
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<tbody>
<tr>
<td>(Parsons et al., 2000)</td>
<td>2000</td>
<td>Texas</td>
<td>Cognitive operations may involve the prefrontal cortex acting on ideas and concepts encoded in the parietal and temporal cortices, under regulatory influences from the limbic system, cerebellum, and</td>
<td>Rapid Intravenous Infusion Of Hypertonic 0.51 M NaCl PET scan</td>
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<tr>
<td>Year</td>
<td>Location</td>
<td>Sample</td>
<td>Details</td>
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<tr>
<td>2005</td>
<td>Israel</td>
<td>Young students</td>
<td>Demonstrated a direct correlation between their hydration state and achievements in cognitive tests.</td>
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<tr>
<td>2009</td>
<td>Somerville, Massachusetts</td>
<td>Taken together, empirical evidence suggests a negative influence of dehydration on mood and cognitive performance.</td>
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<td>2013</td>
<td>East London</td>
<td>It was seen that water consumption has positive effects.</td>
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<td>procedure</td>
<td>reference</td>
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<td>visual attention task</td>
<td>(Goodman &amp; Marino, 2021)</td>
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<td>(letter cancellation).</td>
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<td>Reaction Time Task</td>
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<td>Cambridge Neuropsychological Test Automated Battery (CANTAB)</td>
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<td>Mood - Visual Analog Mood Scales (VAMS)</td>
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<td>Urine Specific Gravity (USG) from digital refractometry (PAL-10S ATAGO Japan)</td>
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<td>Cycle ergometer</td>
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<td>Questionnaire</td>
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<td>Continuous Near-Infrared Spec (fNIRS)</td>
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<td>Visual Analog Scale (VAS)</td>
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<td>Inverse Efficiency Score (IES)</td>
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18. Moore, M. J., White, G. L. & Moore, D. L. Association of relative backpack weight with...
Explaining the Influence of the Observer on Quantum Measurements and the Influence of the Sick Patients on the Doctor

By Prof Maria Kuman

Holistic Research Institute

Abstract- The article explains for the first time the influence of the observer on quantum measurements. 1/ In one set of experiments, it was found that the lifetime of decay of radioactive elements is longer in the presence of spinning liquids or solids. This could only be explained if media between them was present, which was influenced by the spinning. 2/ In another set of experiments, it was found that the lifetime of decay of radioactive elements is longer in the presence of people. Since the Russian scientist Shkatov developed equipment allowing him to measure the spinning of the human’s aura, the longer lifetime of radioactive elements in the presence of people could be explained with the influence of their spinning aura (but again the influence could only be explained with the presence of media, which was influenced by the spinning).

Keywords: spinning influence on quantum measurements; observers’ influence on quantum measurements; observer influence on diffraction patterns; observer influence on radioactive decay.

Explaining the Influence of the Observer on Quantum Measurements and the Influence of the Sick Patients on the Doctor

Prof Maria Kuman

Abstract: The article explains for the first time the influence of the observer on quantum measurements. 1/ In one set of experiments, it was found that the lifetime of decay of radioactive elements is longer in the presence of spinning liquids or solids. This could only be explained if media between them was present, which was influenced by the spinning. 2/ In another set of experiments, it was found that the lifetime of decay of radioactive elements is longer in the presence of people. Since the Russian scientist Shkatov developed equipment allowing him to measure the spinning of the human’s aura, the longer lifetime of radioactive elements in the presence of people could be explained with the influence of their spinning aura (but again the influence could only be explained with the presence of media, which was influenced by the spinning). 3/ In another set of experiments, it was found that without the presence of observer photons and electrons behaved like waves and diffraction pattern was observed when they were passing through two slits. When observer with his spinning aura was present, the photons and electrons behave like particles - diffraction was not observed but only two slits of light. This means that under the influence of observers’ spinning aura the photons and electrons behave like particles, which could only be explained if there was a media influenced by the spinning aura of the observer. We can also expect different type of personalities to influence the quantum measurements differently – positive thinkers (with auras spinning clockwise and sucking energy in) are expected to add energy to the measured quantum system, while negative thinkers (with auras spinning counterclockwise and losing energy) are expected to suck energy from the measured quantum system. Also neurasthenics with their powerful aura with fluctuating intensity (in the presence of which light bulbs blow up and electronic devices and machines stop functioning) are expected to mess up the measured quantum system. Also, the negative influence of the sick patients on the doctor could explain why the American doctors live in average 58.5 years, while the average American lives 75 years.

Keywords: spinning influence on quantum measurements; observers’ influence on quantum measurements; observer influence on diffraction patterns; observer influence on radioactive decay.

As far back as in 1906, G. Taylor first performed the double slit experiment. He found that photons passing through two slits were showing diffraction pattern (alternating light and dark lines), which meant that the photons behaved like waves. However, the photons were not showing the normally observed diffraction pattern when observer was present, which meant that in the presence of observer the photons behaved like particles (only two light lines behind the slits were observed). In 1961, Claus Jonson (from the University of Tubingen) observed the same effect with electrons – when passing through two slits, the electrons were showing diffraction pattern, which meant that the electrons behaved like waves. However, the electrons were not showing the normally observed diffraction pattern when observer was present, which meant that in the presence of observer the electrons behaved like particles [1].

Our science (at the present level) cannot explain this, which means that our science needs to be expanded to be able to explain it. Our science presently claims that we are only material body. Based on my almost 40 years of research on the aura, I claim that we are more than just material body [2] – the aura must always be considered. I found that the aura is weak nonlinear electromagnetic field (NEMF) (1,000 times weaker than the field, which the biocurrents of the material body create), but this weak field rules and regulates everything in the body, not with its strength, but with the information it carries. I found that the NEMF (seen as aura) is emotionally sensitive – the aura shines brighter at positive emotions and is dimmer at negative emotions [3].

Since we say that we are in high spirit when we experience positive emotions and we say we are in low spirit when we experience negative emotions, I concluded that the aura must be our emotional Spirit, which is weak informational NEMF. I rejoiced when I found that the ancient Jewish Cabala was teaching to high priest that the aura is our Spirit [2]. The Russian scientist Shkatov developed equipment that allows him

Author: PhD, Holistic Research Institute, Knoxville, TN 37923, USA. e-mail: holisticare@mariakuman.com
to measure the spinning of the aura. He found that our aura spins and it spins clockwise at positive emotions and counterclockwise at negative emotions [2]. Since the aura (Spirit) is NEMF and nonlinear physics teaches that vortices spin clockwise and suck energy in, while anti-vortices spin counterclockwise and emit energy, I concluded that at positive emotions our aura (Spirit) is brighter because it spins clockwise and sucks NEMF energy in, while at negative emotions our aura (Spirit) is dimmer because it spins counterclockwise and loses NEMF energy.

However, for this to happen there must be a reservoir of NEMF energy available. Is this reservoir of NEMF energy the Space Matrix (called ether in the past) of which the whole material world was created? I answered this question positively in my article “Explaining the Uneven Earth Growth with Time” [4], which was the only way to explain the observed uneven growth of our Earth with time. So, we are not only a material body – we are a material body and Spirit (seen as aura) and this aura (Spirit) spins [1]. Our aura NEMF has a donut shape (Fig. 1), just like the aura NEMF of our Sun (Fig. 2). While our Sun spins clockwise and sucks NEMF energy from the Space Matrix NEMF to become active every 11 years (in average), our aura NEMF at dawn starts spinning clockwise and sucking NEMF energy from the Space Matrix NEMF to become active during the day; our aura NEMF at dusk starts spinning counterclockwise and releasing NEMF energy to the Space Matrix NEMF so that we can rest and sleep during the night [1].

Since our donut-shape aura is NEMF and all nonlinear fields have a chain or chains of alternating vortices and anti-vortices, our aura NEMF has a chain of 7 alternating vortices and anti-vortices along the backbone, which can be seen on Fig. 1.

![Fig. 1: The chain of alternating vortices and anti-vortices along the backbone of the men’s aura NEMF and their corresponding quantum energy levels](image)

These alternating vortices and anti-vortices are numbered with consequent numbers starting with the tailbone and finishing with the top of the head. They are called in ancient Hindu texts “chakras”, which mean “spinning wheals” in Sanskrit. To the seven chakras correspond seven discrete (quantum) energy levels of the aura’s NEMF (Fig. 1) [2]. Look at the quantum energy levels of our aura (Spirit) NEMF and tell me how the spinning NEMF of the observer with quantum energy levels not to be expected to influence quantum measurements. Of course, it would.
II. Explaining why the Lifetime Decay of Radioactive Elements is Longer when Observer is Present

Wolfgang Ketterle from the Massachusetts Institute of Technology reported that the lifetime of decay of radioactive elements is longer when observer is present. The Russian scientist Igor Melnik (Tomsk) did research with spinning liquids and spinning solids in the proximity of decaying radioactive elements and found that the spinning masses were slowing the radioactive decay even from a distance. His results were reported at the International Conference on Torsion Fields and Informational Interactions, held in Sochi in August 2009 [5]. After he studied the influence of spinning liquids and solids on radioactive decay and he found that spinning of both (liquids and solids) slow down the radioactive decay and thus increase the lifetime of the decaying element, he went and studied the Phantom Effect, which is the imprint left on the space after the object has been removed - it allows detection of ex-presence.

However, after all these valuable experiments, Dr. Melnik still couldn’t see the presence (existence) of the Space Matrix (called ether in the past) and its role in the observed experiments. He continued to think and to claim that the spinning objects create fields that are not electromagnetic [5], simply because he lacked knowledge in nonlinear physics and could not see that the involved field is nonlinear electromagnetic field (NEMF). In article [6], I showed that everything material is a material body and NEMF – it comes from the way the material world was created. If so, spinning liquid and solid masses would have spinning NEMF. If this spinning NEMF slower the decay of radioactive...
materials, the spinning torus-shape aura NEMF of the observer (Fig. 1) would do the same.

The phantom experiments of Dr. Melnik definitely pointed out that Space Matrix (ether) does exist. Since we said in Section 1 that we are a material body and emotional Spirit seen as aura (which is spinning weak informational NEMF), we can expect the spinning aura of the observer to slow down the decay of radioactive elements just like the spinning NEMF of spinning liquids and solids do. The spinning torus-shape aura NEMF of all living beings is a result of two fields – the NEMF1 of the material body (which Kundalini Yoga presents as an energy spiral running upward along the backbone and the NEMF2 of the Spirit (which Kundalini Yoga presents as an energy spiral running downward along the backbone [7]).

This means that the two fields (NEMF1 of the material body and NEMF2 of the Spirit seen as aura) of all living beings have opposite polarity and they are attracted to each other, as two magnets with opposite polarity would do. In the way the spinning NEMF of spinning liquids (or solids) slower the decay of radioactive elements, so would the spinning aura (Spirit) NEMF of humans. And this is true for all living beings, whose spinning aura NEMF consist of magnetically coupled NEMF1 (body) + NEMF2 (Spirit).

Not only will the spinning aura of the observer influence quantum measurements, we can expect the quantum measurements to be influenced differently by: 1/ positive thinkers, whose bright clockwise spinning aura will bring NEMF energy to the quantum measurements; 2/ negative thinkers, whose dim counterclockwise spinning aura loose NEMF energy to the Space Matrix NEMF - they are expected to suck energy from what they observe and measure; and 3/ by neurasthenic people, whose strong aura (Spirit) NEMF with fluctuating intensity is expected to mess up the energy of the quantum experiments they observe, in the way they burst light bulbs and disable electronic devices and machines [8].

III. EXPLAINING THE SHORTER LIFESPAN OF DOCTORS LIVING IN THE PRESENCE OF THE SPINNING NEMF OF THEIR SICK PATIENTS

It is a fact that the average lifespan of medical doctors is 58.5 years when the lifespan of the average American is 75 years. This fact can be explained only with negative influence of the aura NEMF of the sick patients on the doctors’ aura NEMF. My measurements showed that negative thinking leads to a disease of genetically inherited weak organ [9]. If so, the sick people are either negative thinkers or people with dominantly negative life experiences, who have dim aura NEMF, which spins counterclockwise and looses NEMF energy to the Space Matrix NEMF. Such sick people, when trying to survive, would suck life energy from the quantum experiments they observe, as well as from the doctors they go to. The fact that sick people suck energy explains the saying: “You don’t look well – are you sick or taking care of a sick person”.

IV. ONLY PREVENTIVE MEDICINE CAN PROLONG THE LIFESPAN OF THE MEDICAL DOCTORS TO NORMAL

The only way to make the medical doctors live as long as the rest of the people (75 years) is to embrace preventive medicine. Then the medical doctors will deal all the time with healthy people trying to keep them healthy. This will make the doctors healthy and allow them to live as long as the rest of the people. Therefore, it is in the interest of all medical doctors to do their best to introduce preventive medicine. Ancient China had preventive medicine. Everybody was going to a doctor-acupuncturist 4 times a year for regular check up with pulse diagnostics. If the pulse diagnosis were detecting a minor deviation from norm, usually only one acupuncture treatment was enough to restore the balance and bring back the health [10]. If the person was getting sick, the acupuncture doctor was obligated to treat him with a series of acupuncture treatments for free because he didn’t do his preventive job properly. Thus, the doctors were paid to keep the people healthy.

V. CONCLUSION

Everything material is a material body and NEMF. It comes from the way the material world was created [6], and automatically explains the dualism wave particle. Since the experiments of Dr. Melnik proved that spinning liquids or solids (which have spinning NEMF) slow down the decay of radioactive elements, this article explained that the slowed down decay of radioactive elements in the presence of observer is a result of the influence of the spinning torus-shape aura NEMF of the observer. The influence of the observer on any quantum measurement is influence of his spinning torus-shape aura NEMF with discrete quantum energy levels (Fig. 1) on the quantum measurements. If the medical doctors live in average only 58.5 years, it is because they are dealing with sick people, whose dim aura (Spirit) NEMF sucks some of doctors’ energy in attempts to survive.

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Evaluation of ‘Referral for Treatment’ System under RNTCP in a Hospital at Kolkata, India

By Dr. Sampa Mitra

Abstract- To handle the problem of tuberculosis (TB), Government of India started the Revised National TB Control Programme (RNTCP) in 1993, whereby Directly Observed Treatment, Short-course (DOTS) was officially adopted as the strategy in 1997. The medical colleges, involved in the RNTCP programme, refer the patients to the DOTS centres near their homes, after assigning the treatment categories. This study attempts to evaluate this ‘referral for treatment’ system during the second phase of RNTCP (RNTCP-II). To achieve this objective, pertinent data regarding 758 patients referred from RG Kar Medical College, Kolkata, to various DOTS centres in West Bengal, between 01.10.2006 and 30.09.2007, were collected from the said medical college, the relevant DOTS centres, the patients themselves, using a suitable questionnaire, and also the family members and the neighbours of some patients. Chi-square test at 5% level of significance was used as an analysis tool.

Keywords: referral, DOTS, RNTCP, RG Kar Medical College, chi-square test.

GJMR-K Classification: DDC Code: 616.995 LCC Code: RC311

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Keywords: referral, DOTS, RNTCP, RG Kar Medical College, chi-square test.

I. Introduction

To tackle the heavy burden of tuberculosis (TB) and improve the quality of treatment, Government of India, in 1993, revitalized its National TB Programme (NTP) as Revised National TB Control Programme (RNTCP). In 1997, Directly Observed Treatment, Short-course (DOTS) was officially adopted as the strategy of RNTCP. By the end of 2005, the whole of India was covered under this programme (i.e., RNTCP). During the second phase of RNTCP i.e., RNTCP-II, which was started in 2006, there was an improvement in the quality and reach of service.

Since 2003, the medical colleges have been involved in the RNTCP programme. Here, the treatment categories are assigned to the patients, after diagnosis.

II. Methodology

In this work, the details regarding the 758 patients (the study population), referred from this college between 01.10.2006 and 30.09.2007, were recorded. The referrals had been classified into two categories viz., inside district (i.e., DOTS centres inside the Kolkata (metropolis) district), and outside district (i.e., DOTS centres outside Kolkata). The data regarding the fate of patients, after their referrals, were also collected. To understand whether there is a significant association between the area of referral and the registration status (at the DOTS centre), between the area of referral and the disease status, between the area of referral and the conversion status of new sputum positive cases, and between the type of patient and the outcome of the treatment after referral, the chi-square tests were done at 5% level of significance, in all the cases. The formula for chi-square ($\chi^2$) is given by equation (1):

$$\chi^2 = \sum \frac{(O-E)^2}{E}$$  \hspace{1cm} (1)

where,

$O =$ each observed value in any one of tables- 2 to 5,
$E =$ each expected value in the same table = (row total X column total / grand total) corresponding to each value in that table,
$p =$ p-value (calculated using relevant software system) corresponding to the chi-square value with 1 degree of freedom.
If $p < 0.05$, then it can be concluded that the relevant association is significant; otherwise, it (i.e., the pertinent association) is not significant. The outline of the method, used in this study, is depicted in figure-1.

![Outline of the method](image)

Fig.-1: Pictorial representation of the outline of the method

### III. Results and Discussions

Table-1 gives a preliminary idea about the study population (i.e., the referred patients) on the basis of age and gender.

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Referrals inside district</th>
<th>Referrals outside district</th>
<th>Total</th>
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<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
</tr>
<tr>
<td>15-44</td>
<td>73</td>
<td>100</td>
<td>184</td>
</tr>
<tr>
<td>Other</td>
<td>48</td>
<td>36</td>
<td>126</td>
</tr>
<tr>
<td>Total</td>
<td>121</td>
<td>136</td>
<td>310</td>
</tr>
</tbody>
</table>

It may be noted here that 15-44 years pertains to the productive age group; hence, it has been highlighted in table-1. It is really a matter of concern that the total number of referrals was much higher for this age group, than for the other groups (as per table-1). Also, table-1 shows that the number of females, referred to DOTS centres inside the district, was more than that of the males, whereas higher number of males, as compared to females, were referred to DOTS centres outside the district.

Table-2 shows how many of the referred patients actually registered in the DOTS centres after referral.
It can be seen from table-2 that a considerable number of patients (95 among 758 i.e., nearly 13%) did not register in the DOTS centre for treatment after referral; this is a cause of worry. Also, it may be noted that the number of non-registered patients at DOTS centres located outside district (i.e., outside the metropolis of Kolkata) is nearly double that for DOTS centres located inside district (i.e., within Kolkata). However, the chi-square test shows that the association between the area of referral and the registration status is not significant at 5% level (p-value=0.85286>0.05; degree of freedom=1). Thus, though there is no significant urban-rural divide in case of registration at the DOTS centres, the relevant authorities should urgently devise ways to urge all the referred patients to register at the DOTS centres; otherwise the problem of TB cannot be handled efficiently.

Table-3 displays how many of the referred patients were newly infected with TB, and how many were infected with TB before, but had come for treatment again, as the previous treatment was unsuccessful.

It is clear from table-3 that quite a large number of patients (119 among 758 i.e., nearly 16%) had come for retreatment due to inadequacy of previous treatment method. This is really a cause of concern. Also, this fact indicates the shortcomings of the ‘referral for treatment’ system going on since 2003. Further, the chi-square test shows that the association between the area of referral and the disease status is significant at 5% level (p-value=0.00738<0.05; degree of freedom=1). It shows that there is a significant urban-rural divide with respect to the adequacy/success of previous TB treatment technique. The pertinent authorities should see that new TB patients get adequate treatment so that, in future, there will be no need for retreating previously treated TB patients. Also, they should ascertain that there is no urban-rural divide with regard to adequacy of TB treatment.

Table-4 depicts how many of the new sputum positive TB patients (who registered in the DOTS centres after referral) were converted into sputum negative patients after 2-3 months of treatment.

<table>
<thead>
<tr>
<th>Area of referral</th>
<th>Conversion status</th>
<th>Conversion rate (%) [AX100/B]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>New sputum +ve cases after 2-3 months (A)</td>
<td>No conversion of new sputum +ve cases after 2-3 months</td>
</tr>
<tr>
<td>Inside district</td>
<td>60</td>
<td>34</td>
</tr>
<tr>
<td>Outside district</td>
<td>78</td>
<td>28</td>
</tr>
<tr>
<td>Total</td>
<td>138</td>
<td>62</td>
</tr>
</tbody>
</table>
It is evident from table-4 that the number of sputum positive patients who were not converted into sputum negative ones in 2-3 months, is substantial (62 among 200 i.e., 31%). The reason for this should be investigated. However, the chi-square test shows that the association between the area of referral and the conversion status is not significant at 5% level (p-value=0.13333>0.05; degree of freedom=1). Thus, there is no significant urban-rural divide in case of conversion of sputum positive patients; rather the conversion rate is better for patients attending DOTS centres outside Kolkata, than for the ones attached to DOTS centres within Kolkata. Anyway, competent authorities should find out ways to ensure 100% or near 100% conversion rate after 2-3 months of treatment, instead of 69%, as shown in table-4.

Table-5 presents how many of the patients who registered at the DOTS centres, got positive/favourable result after treatment. In this table, (i.e., table-5), “favourable outcome” implies any one of the following:

- the patient was cured, and
- the patient’s treatment was completed, but it was not ascertained whether the patient was ultimately cured or not (i.e., -ve sputum was found at the end of initial phase of treatment, but sputum was not tested at the end of the final phase),

and “unfavourable outcome” indicates any one of the following:

- the patient died during treatment, irrespective of the cause,
- the patient defaulted (i.e., at any time after registration, the patient did not continue the treatment for 2 months or more consecutively),
- the patient was transferred to another area, and
- the patient’s treatment failed (i.e., +ve sputum was found after ≥5 months of treatment), but the patient was not dead (when the data were collected).

Table-5 indicates that the number of patients for whom the outcome of the treatment was unfavourable (unfavourable outcome includes death, as already indicated), is considerable (79 among 662 i.e., nearly 12%). This matter needs urgent attention of the pertinent authorities. Moreover, the chi-square test shows that the association between the type of patient (seriously ill/not seriously ill) and the outcome of treatment is significant at 5% level (p-value=0.00001<0.05; degree of freedom=1). This is also a cause of worry.

It may be mentioned here that in table-5, patients with category-I treatment regimen are the new sputum positive pulmonary TB cases, the new sputum negative pulmonary TB cases, who are seriously ill, the new cases of extra-pulmonary tuberculosis, who are seriously ill, and all the new TB cases with known HIV positive status (Central TB Division (under Directorate General of Health Services of Government of India) 2005). Patients with category-II treatment regimen, in table-5, are the sputum positive relapse cases, the sputum positive failure cases, the sputum positive default cases currently under treatment, and the others i.e., extrapulmonary relapse or failure cases (Central TB Division (under Directorate General of Health Services of Government of India) 2005). And, in the same table, i.e., table-5, the patients with category-III treatment regimen are the new sputum negative pulmonary TB cases, who are not seriously ill, and the new extra-pulmonary TB cases, who are not seriously ill (Central TB Division (under Directorate General of Health Services of Government of India) 2005).

Further, in table-5, the total number of registered patients is shown as 662, while it is mentioned as 663 in table-2. Actually, for one of these 663 registered patients, the mode of treatment was other than DOTS; hence, the outcome of treatment he/she received is not relevant to this study, and his/her case has not been included in table-5.

Thus, this study shows that there are certain serious lacunae in the system of ‘referral for treatment’ in West Bengal, which should be urgently looked into. These are:

- the problem of not registering at the DOTS centre after referral,
- the problem of inadequacy of previous TB treatment method (indicating the drawbacks of the ‘referral for treatment’ system which includes the drug treatment) going on since 2003), and the urban-rural divide with regard to this,
- the problem of low rate of conversion from sputum positive to sputum negative patients after 2-3 months of treatment, and

### Table 5: Distribution of registered patients according to outcome of treatment

<table>
<thead>
<tr>
<th>Type of patient</th>
<th>Favourable outcome</th>
<th>Unfavourable outcome</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seriously ill (categories- I and II)</td>
<td>416</td>
<td>76</td>
<td>492</td>
</tr>
<tr>
<td>Not seriously ill (category-III)</td>
<td>167</td>
<td>3</td>
<td>170</td>
</tr>
<tr>
<td>Total</td>
<td>583</td>
<td>79</td>
<td>662</td>
</tr>
</tbody>
</table>
the problem of unfavourable outcome (which includes death) following treatment, and its dependence on the type of patient (i.e., whether he is seriously ill or not).

Further, this study indicates a high prevalence of TB among the patients of productive age group viz., 15-44 years; this matter also needs urgent attention.

Before concluding this section, it will be prudent to have a quick look at the findings of some of the other researchers working in this field.

Kondapaka et al. found that among the patients admitted to Government General and Chest Hospital, Hyderabad (India), between 1st January, 2010 and 30th June, 2010, for treatment of TB, 921 were ultimately referred to peripheral centres, but formal feedback was received for only 682 of them, indicating deficiencies in the system of referral for treatment and feedback (Kondapaka et al. 2012). Bharaswadkar et al. studied the role of Private Practitioners (PPs) in RNTCP in Pune (India) in 2010, and observed that though many PPs worked as referral centres, a considerable number of them were not adhering to the standard international guidelines for the treatment of TB (Bharaswadkar et al. 2014). Jayabal et al. noted that for a considerable number of TB patients, referred within and outside the Chennai district (India) by some Tuberculosis Units of Chennai Municipal Corporation, between January 1, 2014 and June 30, 2014, either no further information was available or treatment was not initiated (Jayabal et al. 2017). Thomas et al. conducted research, in 2015-16, on some TB patients of Chennai (India) who stopped following up the treatment process either during diagnosis, or at the time of referral/hospital admission, or when the official RNTCP registration process was to be done, and discussed various possible reasons for this behaviour of the patients (Thomas et al. 2020). Stalin et al. devised an intervention package to reduce the number of those TB patients of the Puducherry district (India), who were referred for treatment by four medical colleges in the district, but for whom no feedback was available (Stalin et al. 2020). They (i.e., Stalin and his group) observed that before using the package, the percentage of such patients was 54 (in the 3rd and the 4th quarters of 2016), and after applying the package, it became 34 (in the 2nd quarter of 2017) (Stalin et al. 2020). Arora et al. found that among the 4395 TB patients, handled by Maulana Azad Medical College, Delhi (India), and its associated hospitals, between July 2018 and March 2019, 3315 were referred out, but feedback was received for only 797 of them (Arora et al. 2021).

Thus, these studies point out the drawbacks in the system of ‘referral for treatment’, in various parts of India, other than West Bengal.

IV. Conclusions

This study evaluated the system of ‘referral for treatment’ in West Bengal, in 2007-08, and found certain serious shortcomings in this technique, with regard to percentage of registration at DOTS centre, adequacy of previous TB treatment method (which gives an idea about the performance of the ‘referral for treatment’ system going on since 2003), rate of conversion from sputum positive to sputum negative patients after 2-3 months of treatment, and chance of overall positive result following treatment.

Also, this work shows a high occurrence of TB among the patients of productive age group i.e., 15-44 years.

A more comprehensive study needs to be done to judge the strengths and the weaknesses of not only the system of ‘referral for treatment’ but also the RNTCP programme, considering the fact that the problem of TB in India should be handled effectively and urgently. This task may be taken up in future, if possible.

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Hospital Quality Management: Steps to Implement Quality in Health Care Facilities

By Sahar Moukhafi
Tofail University

Abstract- In the health sector, systems are often under pressure, as they must control heavy expenses, adapt to the imperatives of their constraining contexts and satisfy the evolving needs of patients through quality services and care. As a result, managing the quality of hospital care has become a major economic, sociological and political issue.

The aim of this article is to identify the main steps in the implementation of quality of care practices in a health care institution.

Keywords: hospital quality management, quality of care, health care institutions.


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Hospital Quality Management: Steps to Implement Quality in Health Care Facilities

Management De La Qualité Hospitalière: Étapes D’application De La Qualité En Établissements De Santé

Sahar Moukhafi

Abstract- In the health sector, systems are often under pressure, as they must control heavy expenses, adapt to the imperatives of their constraining contexts and satisfy the evolving needs of patients through quality services and care. As a result, managing the quality of hospital care has become a major economic, sociological and political issue.

The aim of this article is to identify the main steps in the implementation of quality of care practices in a health care institution.

Keywords: hospital quality management, quality of care, health care institutions.

Résumé- Dans le secteur de la santé, les systèmes sont souvent sous pression, car ils doivent maîtriser les lourdes dépenses, s’adapter aux impératifs de leurs contextes contraignants et satisfaire les besoins évolutifs des patients à travers des services et des soins de qualité. De ce fait, la gestion de la qualité des soins hospitaliers est devenue un enjeu majeur sur le plan économique, sociologique et politique.

L’objectif de cet article est d’identifier les étapes principales d’application des pratiques de la qualité des soins dans un établissement de santé.

Mots clés: management de la qualité hospitalière, qualité des soins, établissements de santé.

Introduction

Le monde hospitalier se caractérise d’une grande complexité, en effet l’hôpital, qui a pour mission principale la production de soin, est un terrain d’interaction entre les savoirs médicaux, soignants et la gestion administrative, le management de la qualité hospitalière se propose comme l’ultime moyen d’assurer la réussite de cette mission en assurant l’amélioration continue de la qualité des soins.

En effet le management de la qualité hospitalière est le résultat d’un ensemble de pratiques, méthodes et concepts développés à partir de données collectées au sein de l’établissement de santé, et définis par les écrits de plusieurs auteurs.

L’instauration des principes du management hospitalier au sein de la structure de soin reste un défi à relever par le personnel soignant.

Une question principale se pose:

- Quelles sont les étapes clé de l’application d’un système de management hospitalier?

Plusieurs questions en découlent:

- Quelles sont les dimensions de la qualité des soins?
- Quelles sont les méthodes et les outils essentiels pour l’application de ces étapes?
- Quel est le rôle que joue l’audit clinique dans cette démarche?
- Quelle place occupe l’accréditation dans ce système?

I. Qualité et Satisfaction des Besoins

a) Le concept de conformité

La conformité du service rendu se définit par la réponse adéquate aux besoins et préférences du client (celui qui reçoit la prestation) d’une part, et au niveau de qualité de la prestation d’autre part, qui doit être supérieur à ce qui appelé non qualité, il s’agit, donc, de deux notions qui engendrent la non qualité:

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Par conséquent, il est important de définir et connaître les besoins du client pour assurer la conformité, et donc la qualité. L'identification des besoins s'effectue à partir d’un accord mutuel entre fournisseur et client, en ce qui concerne l’expression et l’acceptation de leurs besoins.

En effet, pour une définition correcte du besoin, il faut savoir qu’il existe trois niveaux de satisfaction:
- Niveau de besoin latent: le plus qui fera la différence entre un service et un autre
- Niveau de besoin explicite: la conformité aux exigences
- Niveau de besoin implicite: le dû car évident est essentiel.

b) Le concept de prévention
A partir des trois niveaux de satisfaction cités au paravent, l’entité a la possibilité d’apporter trois types de réponses lorsqu’il y’a insatisfaction:
- La réparation: des moyens curatifs sont mis en œuvre pour traiter les défauts constatés. Le processus n’est pas remis en cause pour éviter de reproduire le dysfonctionnement.
- Le contrôle: l’objectif est d’éviter que le client constate le défaut.
- La prévention: des moyens préventifs sont mis en place pour que le défaut ne puisse plus se reproduire. L’effort consenti à la prévention pourra réduire très significativement la réparation. Dans ce cas, il s’agira de tendre à donner une réponse conforme dès le premier coup et toutes les fois suivantes.

II. Les Différentes Typologies de la qualité

Il existe quatre types de qualité dans la relation client-fournisseur qui diffèrent selon la perception de chaque acteur de soins
- La qualité voulue: c’est celle qui est exprimée sous forme de critères explicites qui permettent, par la suite, de mesurer la conformité. La qualité voulue est généralement définie par les professionnels et le législateur sur la base de références légales ou réglementaires et de consensus professionnel.
- La qualité attendue est celle que le patient construit à partir de son vécu, son expérience antérieure, l’environnement du système de soins dans lequel il se trouve.
- La qualité vécue: elle dépend à la fois de la qualité attendue et de la qualité délivrée. C’est celle qu’expérimente le patient.
- La qualité délivrée est celle que reçoit réellement le patient.

L’écoute des clients a pour objectif de réduire les écarts mesurés entre les différents types de qualité.

a) Les dimensions de la qualité des soins
Selon S.M. SHORTELL1 (SHORTELL S.M., 1998), il existe quatre dimensions fondamentales au développement de la démarche qualité:
- La dimension stratégique
  Elle a comme but d’apporter une vision prospective de la démarche qualité au sein de l’établissement de santé par le choix des processus clefs et des objectifs que l’on veut atteindre. Cette dimension aide à mobiliser les acteurs de soin autour d’objectifs qualité précis et légitimer la démarche qualité dans le fonctionnement quotidien de la structure.
- La dimension technique
  Cette dimension regroupe trois éléments principaux liés au savoir-faire des acteurs:
  - La gestion de projet: c’est l’ensemble des composantes du management de la qualité mis en œuvre dans la structure pour atteindre les objectifs fixés
  - L’organisation du système qualité: elle regroupe la formalisation de la démarche globale
  - La maîtrise des outils et méthodes: ils servent à mettre en œuvre les différents projets qualité et sont adoptés en fonction des processus analysés. Il est souhaitable que ces outils et méthodes soient

harmonisés afin de limiter les coûts d’implantation et de formation des personnels.

- La dimension structurale
  Cette dimension s’intéresse à la mise en place des structures d’organisation qui sont importants pour la démarche. La coordination efficace est nécessaire pour apporter les actions d’amélioration liées à la démarche, elle représente une base fondamentale pour sa réussite. C’est la structure de coordination qui se charge d’assurer cet aspect et de donner du sens et de la cohérence au projet qualité. C’est le rôle que joue le comité de pilotage ou la cellule qualité.

- La dimension culturelle
  Cette dimension rassemble toutes les représentations, croyances, valeurs ou comportements des acteurs qui aide à la mise en place de la démarche qualité et le développement d’une culture de la qualité dans l’établissement.

Shortell précise les conséquences de la prise en compte insuffisante de chacune des dimensions:

Tableau 04: Dimensions de la qualité des soins

<table>
<thead>
<tr>
<th>STRATEGIQUE</th>
<th>CULTURELLE</th>
<th>TECHNIQUE</th>
<th>STRUCTURELLE</th>
<th>RESULTATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Pas de résultat significatif sur les sujets essentiels</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>Petits résultats temporaires. Pas de persévérance</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>Frustration des acteurs. Faux départs.</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>Pas de capitalisation ni d’extension des apprentissages</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Persévérance de la démarche au sein de l’organisation</td>
</tr>
</tbody>
</table>

b) Le concept du niveau de qualité
Le qualiticien américain P. Crosby (CROSBY, 1996) affirme que les politiques qualité mises en place sur le terrain sont hétérogènes et se caractérisent par des niveaux de maturité très différents. Il existe cinq étapes chronologiques dans le management de la qualité allant du plus simple au plus élaboré sont énoncées par Crosby: l’incertitude, l’éveil, la prise de conscience, la sagesse, la certitude. Chacun de cette étape réfère à un niveau de qualité déterminé. Il faut savoir que la plus part des établissements de santé mettant en place une démarche qualité se placent entre le premier et le deuxième niveau.

Niveau 1 = l’incertitude: l’établissement dispose d’un personnel compétent. Ce niveau de qualité se réfère à disposer d’un personnel qualifié, placé au bon endroit susceptible d’intervenir au bon moment.

Niveau 2 = l’éveil: l’établissement entreprend des contrôles a posteriori. A ce niveau, l’effort est surtout concentré sur la réparation du dysfonctionnement; la durée des suivis est souvent peu prolongée. L’objectif n’est pas de maîtriser a priori les facteurs pouvant engendrer des dysfonctionnements. Il n’y a pas d’organisation généralisée.

Niveau 3 = la prise de conscience: l’établissement a structuré la gestion de la qualité par projets. C’est le mode de gestion le plus utilisé. L’établissement se préoccupe de traiter les dysfonctionnements principaux, à prendre en charge certains processus clés et à répondre aux exigences réglementaires conjoncturelles. Il n’y a pas d’approche systémique de la qualité.

Niveau 4 = la sagesse : l’établissement maîtrise ses principaux processus. Le terme de maîtrise se traduit comme la définition des points d’organisation nécessaires (qualification, moyens, temps alloué, procédures...) et formalisés, destinés à minimiser les risques de dysfonctionnement.

Niveau 5 = la certitude: l’établissement applique une gestion globale de la qualité, la qualité est pilotée et couvre l’ensemble des activités de l’établissement.

III. Les Niveaux D’exigence et Leurs Spécificités d’Obligations
Il faut savoir que chaque niveau de qualité correspond à un niveau d’exigences précis, et en fonction de ses deux éléments, l’établissement choisit le système qualité approprié.

- Exigence de moyens: l’établissement doit acquérir les moyens appropriés. C’est le niveau minimal qui permet à l’entité de s’engager pour garantir des standards plus ou moins élevés en fonction de sa nature de l’activité.

• Exigence d’efficacité des moyens: l’établissement doit s’assurer que les moyens nécessaires soient disponibles au bon moment, au bon endroit et en quantité suffisante. La mauvaise organisation représente une des causes principales de dysfonctionnement.

• Exigence d’amélioration: l’établissement doit analyser les processus afin de les améliorer d’une manière continue. Cette exigence se préoccupe du côté préventif et correctif. L’amélioration continue se base sur les efforts fournis par les groupes de travail.

• Exigence de maîtrise: l’établissement doit s’occuper de la configuration des processus afin d’assurer de façon systématique un résultat conforme et que les résultats non conformes soient supprimés, si possible avant d’être produits.

• Exigence de preuve: l’établissement doit fournir des preuves qui montrent que l’on fait, ce que l’on dit, à l’aide des enregistrements.

C’est selon l’activité et la stratégie de développement de la qualité de l’établissement, et aussi selon ses objectifs qualité, que se détermine ces différents niveaux d’exigence.

Si la qualité accrédite mélange les différents niveaux d’exigence, la majorité des référentiels fait appel à des exigences de moyens ou d’organisation des moyens.

IV. Les Outils et Méthodes

a) Les méthodes utiles au pilotage

Les professionnels de santé réussissent, généralement, à trouver des moyens et méthodes pour améliorer les organisations et s’adapter à l’évolutions pratiques. Ceci dit quand il s’agit de mettre en place une démarche d’envergure avec des résultats important, il est primordial de sélectionner et adopter les outils nécessaires pour. Leur réussite. Ces méthodes et outils aident l’organisation à structurer la démarche qualité d’une part, et d’obtenir des améliorations significatives et mesurables dans le temps d’autre part.

La littérature présente un ensemble de techniques de la qualité, qui se caractérisent par un langage spécifique et des logiques propres ce qui rend difficile leurs appropriations par les acteurs du secteur de santé.

Nous présentons les techniques qui sont apparues les plus appropriées pour s’appliquer à la démarche qualité en hôpital.

<table>
<thead>
<tr>
<th>Mettre en œuvre uneorganisation</th>
<th>Exigence de moyens et organisation des moyens</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifier des besoins</td>
<td>Exigence de moyens et organisation des moyens</td>
</tr>
<tr>
<td>Coordonner des services</td>
<td>Exigence d’amélioration</td>
</tr>
<tr>
<td>Améliorer de façon continue</td>
<td>Exigence d’amélioration</td>
</tr>
<tr>
<td>Maîtriser les isoques infectieux</td>
<td>Exigence d’isoque</td>
</tr>
</tbody>
</table>

A. L’approche processus

L’A.N.A.E.S. définit le processus « comme un ensemble plus ou moins complexe de taches élémentaires, accomplies par un professionnel ou un groupe de professionnels, faisant appel à des ressources (équipement, matériel, information, compétences), destinées à obtenir un résultat donné ».

(A.N.A.E.S, 2002)

Pour l’A.F.N.O.R., « l’approche processus vise à adapter les différentes entités de l’organisme pour former une série de chaînes d’activités homogènes et maîtrisables, regroupées en fonction de leur contribution aux différents flux de création de valeur pour le client ».

L’approche processus sert à identifier et analyser la contribution de chaque secteur concerné par la réalisation d’un produit ou d’une prestation.

Il faut savoir que la spécialisation des secteurs et des acteurs qui les composent, ne cesse de progresser en domaine de santé, et c’est l’approche processus qui aide à améliorer la coordination des interfaces en décloisonnant l’organisation verticale traditionnelle. La transversalité est un élément important du processus. (Stéphane Mathieu, 2003)

Au-delà de la qualité technique de chaque étape du processus concerné, l’objectif est de prendre en considération la qualité du système organisationnel mis en place.

• L’identification des processus

C’est une étape essentielle qui a pour objectif de définir les responsabilités des différents acteurs dans le cadre du travail et de mettre en place une gestion de projet. Il est souhaitable de préciser les processus clés. Ce sont ceux qui sont permanents et opérationnels et qui ont le plus d’importance dans la production du produit au service. C’est aussi ceux qui sont à l’origine des dysfonctionnements les plus importants et qui ont le plus d’impact sur la satisfaction des usagers de soins.

Les processus clés sont ceux qui sont en lien direct avec la prise en charge du patient (processus d’accueil, de sortie, etc.), ceux en lien avec le soutien logistique (maintenance, approvisionnement, etc.) et ceux liés au management de l’institution (élaboreation du


projet d’établissement, processus de recrutement des personnels, suivi des budgets par exemple).

- La description du processus
  Cela consiste à décrire concrètement comment les activités se déroulent au sein du processus concerné puis de les analyser afin de détecter les dysfonctionnements et leurs causes. Comprendre les différentes étapes du processus aide à le modifier pour que les résultats attendus soient fiables et se pérennisent.

- L’amélioration du processus

- La maîtrise des processus
  Ce niveau de maîtrise se base essentiellement sur:
  - Établir des procédures claires qui décrivent la façon de réaliser l’action,
  - Organiser la formation du personnel,
  - Renforcer l’encadrement de proximité qui doit s’assurer du suivi,
  - Assurer la mesure et le suivi d’indicateurs,
  - Utiliser les méthodes d’audit.

B. La méthode P.A.Q. – A.N.A.E.S.
  C’est une méthode qui vise l’amélioration de la qualité, testée dans 64 établissements français entre 1995 et 1997 et fondée sur l’étude des processus. Elle s’occupe des processus qui ont une relation avec la prise en charge du patient au sein d’un établissement de santé. Les objectifs de la méthode sont les suivants:
  a. Décrire de façon structurée les processus étudiés
  b. Identifier les points de dysfonctionnement
  c. Définir les actions d’amélioration puis les mettre en œuvre
  d. Mesurer les améliorations obtenues.

  Cette méthode s’applique au niveau des processus et bien délimités, tels que la préparation de la sortie du patient. Elle prend en considération la relation « client-fournisseur ».

  Au sein d’un même processus, la méthode P.A.Q. peut être utilisée sur certains segments et combinée à d’autres méthodes.

La méthode se base sur 4 étapes:
  - Identifier le processus
  - Décrire le processus
  - Construire un nouveau processus
  - Améliorer le processus.

C. L’audit clinique
  Développée en France par l’A.N.D.E.M., cette méthode a pour objectif l’évaluation, elle permet de comparer les pratiques de soins à des références admises, à travers l’utilisation de critères pré définis. Elle a comme buts:
  - Mesurer l’écart entre la pratique et la référence.
  - Définir et mettre en œuvre des actions d’amélioration.
  - S’assurer de l’efficacité des actions d’amélioration.

  Elle est souvent utilisée pour mesurer et améliorer une pratique professionnelle bien définie comme, par exemple, la tenue du dossier de soins. Elle est plus efficace quand l’établissement cible les pratiques professionnelles qu’il souhaite évaluer.

Elle comprend six étapes:
  - Le choix du thème en fonction de la fréquence de la pratique et du risque encouru par le patient
  - Le choix des critères
  - Le choix de la méthode de mesure
  - Le recueil de données
  - L’analyse des résultats
  - La mise en œuvre de plan d’actions d’amélioration.

D. La méthode P.D.C.A. : Plan Do Check Act : la roue de Deming
  C’est un mécanisme de conduite et d’amélioration de projet qui a pour objectif l’exécution d’une tâche de façon efficace et séquentielle, elle est conçue par le qualitologue américain Deming, et peut s’appliquer à tous les processus, qu’il s’agisse de l’élaboration d’un projet d’établissement par exemple ou d’une action trésclée.

Elle se caractérise par 4 objectifs:
  - Plan: établir un plan, prévoir. C’est définir le but et l’objectif de l’action en fixant des objectifs mesurables et les méthodes à utiliser pour les atteindre. A cette phase, il s’agit également de définir les moyens nécessaires à mettre en œuvre pour atteindre les objectifs définis.
  - Do: exécuter le plan. La mise en œuvre du plan nécessite à ce stade la formation suffisante des personnels concernés. Le détail de l’action et sa finalité doivent être explicites en amont de l’exécution de la tâche.
  - Check: vérifier les résultats. C’est au cours de l’action que va se vérifier l’hypothèse de départ. Il est important que les facteurs de l’action et leurs causes aient bien été identifiées. Ensuite, il s’agit de vérifier si les résultats obtenus sont conformes aux méthodes définies dans le plan et aux résultats attendus.
  - Act: prendre des mesures correctives ou maîtriser les résultats obtenus. C’est à ce stade que l’on trouve la notion de roue de Deming: les écarts

observés doivent être suivis d’une analyse des causes et d’un nouveau plan d’actions.

b) Les outils de construction

A. Le diagramme de GANTT

L’établissement de santé peut être amené à piloter un certain nombre de projets simultanés pour lesquels se déclinent des actions à réaliser dans des délais impartis.

Le diagramme de Gantt est un outil qui sert à planifier ces actions et de visualiser plus facilement le déroulement du projet. Concrètement, le diagramme de Gantt est un planning représentant en abscisse l’échelle du temps et, en ordonnée, la liste des actions. Cela suppose que:
- Les actions soient identifiées
- Les actions soient priorisées et quantifiées en termes de délais, de charge et de ressources
- Qu’il y ait une cohérence d’ensemble dans l’enchaînement des actions.

La méthode de construction:
- Définir son début et sa fin
- Identifier les questions: un logigramme s’articule autour de choix qui sont autant de réponses possibles aux questions que l’utilisateur peut se poser lors de sa lecture
- Identifier la chaîne principale: c’est le squelette du logigramme, c’est-à-dire l’enchaînement logique de la procédure “si tout se passe bien” sans nécessité d’aiguillage.
- Identifier les boucles: chaque fois qu’une question est posée, une boucle de logigramme est créée entre la question posée et la chaîne principale lorsque l’exécution ou la variante se termine.

B. Le logigramme

Le logigramme est génialement utilisé dans les démarches qualité, c’est la description graphique des enchaînements logiques d’une série d’opérations. Il a pour objectif de transcrire et à visualiser rapidement un mode opératoire ou un protocole. Un logigramme se lit comme un jeu de piste, un roadbook. Par sa forme, il représente en une seule fois l’ensemble des opérations et des choix décrits.

V. ACCRÉDITATION – DÉMARCHE QUALITÉ: DES LIENS ÉTROITS

L’accréditation peut se définir comme le « contrôle du contrôle ». Son objet est d’établir la confiance en garantissant la compétence et l’impartialité des organismes accrédités. Par l’établissement d’accords de reconnaissance internationaux, elle vise à la facilitation des échanges commerciaux: un seul essai, une seule certification partout reconnue par Daniel Pierre, Directeur du COFRAC, Président d’EA, Vice-président d’ILAC.

Le guide ISO/CEI n°2 définit l’accréditation comme une procédure par laquelle un organisme faisant autorité reconnaît formellement qu’un organisme
ou un individu est compétent pour effectuer des tâches spécifiques.

En d'autres termes, il s'agit d'un contrôle de second niveau s'exerçant sur les organismes d'attestation de la conformité (laboratoires, organismes d'inspection, organismes certificateurs) afin d'attester de leur compétence pour réaliser des étalementges, des essais ou des inspections ou pour certifier des produits, des systèmes ou des personnes.

Dans le domaine de santé, l'accréditation et la qualité sont deux démarches étroitement liées, qui forment un nouveau système à intégrer dans les établissements de santé.

Anne Marie Boix⁶ (OIXAM) explique cela en affirmant que l'accréditation, « visant explicitement à introduire une démarche institutionnelle d'amélioration de la qualité, l'accréditation constitue bel et bien le nouvel ordre auquel l'ensemble des établissements doit se référer ».

a) L'accréditation : principes et objectifs

A. Principes

L'accréditation est une procédure d'évaluation externe à un établissement de soins qui est réalisée par des professionnels, indépendante de l'établissement ou de ses organismes de tutelle, son objectif est d'évaluer l'ensemble de son fonctionnement et de ses pratiques, afin de garantir la sécurité et la qualité des soins donnés au malade et à instaurer une politique de développement continu de la qualité au sein de l'établissement. L'organisme accréditeur établit avec tous les acteurs du système de santé des normes et des référentiels, conçus pour apprécier les structures, les procédures et les résultats en termes de gain de santé et de satisfaction du patient.

Dans le cadre défini par l'ordonnance du 24 avril 1996, cette procédure est conduite par l'agence nationale d'accréditation et d'évaluation en santé (ANAES).

En se basant sur des référentiels, la procédure d'accréditation évalue le positionnement de l'établissement par rapport à des références thématiques qui sont:

1. Le patient et sa prise en charge
   - Droits et Information du Patient (DIP)
   - Dossier du Patient (DPA)
   - Organisation de la Prise en Charge du patient (OPC)

2. Management et gestion au service du patient
   - Management de l'Établissement et des secteurs d'Activité (MEA)
   - Gestion des Ressources Humaines (GRH)

3. Qualité et la prévention
   - Gestion de la Qualité et Prévention des Risques (QPR)
   - Vigilances Sanitaires et Sécurité Transfusionnelle (VST)
   - Surveillance, Prévention et contrôle du risque Infectieux (SPI)

   C'est une procédure qui aide à l'évaluation de la qualité au sein de l'établissement sur l'ensemble des thèmes, et qui permet de mesurer le niveau de structuration de la démarche qualité au plan institutionnel. Il est considéré comme un système de reconnaissance externe de la qualité qui structure une démarche explicitement définie par étape.

B. Objectifs

En application de l'ordonnance du 24 avril 1996, la procédure conduite par l'A.N.A.E.S. définie six objectifs principaux:

- L'appréciation de la qualité et de la sécurité des soins
- L'appréciation de la capacité de l'établissement à améliorer de façon continue la qualité des soins et la prise en charge globale du patient
- La formulation de recommandations explicites (l'A.N.A.E.S, 2003)
- L'implication des professionnels à tous les stades de la démarche qualité
- La reconnaissance externe de la qualité des soins dans les établissements de santé
- L'amélioration de la confiance du public.

b) Le champ d'activité de la procédure

La procédure d'accréditation concerne tous les établissements de santé: publics et privés, civils et, potentiellement, militaires, les établissements assurant l'prise en charge au titre de l'hospitalisation à domicile, ceux exerçant une activité de dialyse, les réseaux de soins et les groupements de coopérations sanitaires entre établissements de santé.

L'accréditation ne s'applique pas actuellement aux activités médico-sociales, même lorsque celles-ci, et c'est le cas des hôpitaux locaux, s'exercent au sein d'un établissement de santé.

Elle s'applique à l'établissement au sens juridique du terme et concerne l'ensemble des structures et des activités d'un établissement.

c) Les étapes de ladémarche

La phase d'auto-évaluation se considère comme le cœur de la procédure d'accréditation, elle aide à construire un diagnostic de l’existant à travers une démarche participative basée sur le référentiel A.N.A.E.S. Les résultats de cette auto évaluation se soumettent à l'A.N.A.E.S. Une équipe d'experts
visiteurs, dont le nombre varie en fonction de la taille de l’établissement, se déplace ensuite sur site afin d’évaluer la dynamique d’amélioration de la qualité en s’appuyant sur les résultats de l’auto évaluation. Ces experts sont tous des professionnels de santé en exercice, formés par l’A.N.A.E.S.

Dans les deux mois qui suivent la visite, le rapport rédigé par les experts se transmet à l’établissement de santé, qui peut faire des remarques ou de donner des précisions.

Une analyse du rapport et des observations de l’établissement est ensuite faite par le collège d’accréditation de l’A.N.A.E.S. qui formule ses conclusions dans un rapport d’accréditation. Celui-ci comprend d’éventuelles recommandations, voire d’éventuelles réserves assorties de précisions sur les modalités de suivi.

VI. Les Enjeux de l’Accréditation

- Des enjeux réglementaires
  Les établissements ont l’obligation de s’engager dans la procédure en signant un contrat d’accréditation avec l’A.N.A.E.S.

  Il s’agit également, notamment grâce à l’examen des fiches de sécurité, de permettre à l’établissement de se mettre davantage en conformité avec les normes en vigueur. C’est le cas par exemple de la sécurité incendie, de la pharmacie, de la sécurité de l’air ou de l’eau.

- Des enjeux liés à l’amélioration continue de la qualité
  Le but est de constituer une démarche pérenne, qui permet de créer une véritable culture institutionnelle de la qualité dans l’établissement.

- Des enjeux organisationnels
  L’accréditation permet de développer une approche transversale de l’organisation et non plus un modèle de management vertical. Mobilisation des personnels, développement des interfaces, décloisonnement, l’objectif est de mettre en place une culture de partage des responsabilités.

- Des enjeux de positionnement de la structure
  La publication du rapport du collège sur Internet et sa transmission à l’A.R.H. impacte l’image et le positionnement de l’établissement dans son bassin d’attraction. En interne, comme vis à vis de la population locale.

- Des enjeux pour le patient
  Il s’agit de créer un lien de confiance avec le patient, en une structure capable de mettre en place et de respecter un ensemble de procédures d’amélioration de la qualité et de la sécurité des soins.

- Des enjeux budgétaires et financiers
  Il n’existe pas encore de liaison claire et officielle entre l’accréditation d’un établissement et l’allocation de ses ressources. Cependant, les coûts liés à la non qualité peuvent être réduits.

VII. Les Perspectives


⇒ Une deuxième procédure expérimentale simplifiée et comprenant davantage l’appréciation de la qualité du service médical rendu est mise en œuvre depuis 2004 avec les établissements volontaires ayant transmis leur premier cycle.

VIII. Méthodes de la Qualité Hospitalière Inspirées du Monde Industriel

Il existe trois méthodes principales de la qualité développées dans l’industrie: le contrôle final a posteriori; l’assurance qualité et la qualité totale.

- Le contrôle final a posteriori

  Le contrôle final a pour mission de mesurer la qualité du produit final et son aptitude à satisfaire les clients externes et internes. Il n’est pas utilisé actuellement dans le secteur de santé, mais certaines approches traditionnelles de la qualité des soins se sont inspirées de lui.

7 A.N.A.E.S., « Dossier de presse accréditation », Paris : Juin 2003 – contact.presse@anaes.fr
La qualité a comme objectif de satisfaire les besoins du client, ainsi l’entreprise s’engage à produire des biens et services qui sont conçus pour répandre aux attentes des consommateurs. Tous les moyens de contrôle et de correction entrepris par l’entreprise s’intègrent dans ce même objectif.

L’assurance qualité propose des procédures de contrôle et dispositifs préventifs qui ont comme rôle de s’assurer de la qualité du produit durant tous les niveaux de production. Le contrôle ne se fait plus qu’en bout de chaîne de fabrication.

Dans les années 1980, l’application du principe de l’assurance qualité au domaine hospitalier apparaît aux États-Unis, au Royaume-Uni, puis au Pays-Bas, le processus de l’audit se base sur l’évaluation et l’observation de toutes les activités de soins en référence à des normes et standards préétablis., par la suite la norme ISO 9001 voit le jour dans le domaine industriel et ne trouve pas de difficultés à s’intégrer au milieu hospitalier, mais il est constaté rapidement plus tard que cette norme est peu appropriée aux pratiques cliniques, donc une troisième approche se manifeste qui est l’accréditation,

• Qualité totale

Les bases de la qualité totale ont été mises en évidence par l’assurance qualité évoquée précédemment qui sont:

• Le contrôle de la qualité débute dès la conception du produit jusqu’à la livraison au consommateur.
• Le contrôle de la qualité implique toute personne qui intervient dans le processus de fabrication.

Cette approche est fondée sur cinq principes fondamentaux:

• Se focaliser sur le client, l’un des principes clés de l’assurance qualité.
• Se baser sur l’approche processus avec une vision préventive,
• Impliquer toutes les fonctions dans la démarche qualité.

• Se donner comme but l’amélioration continue, tiré de la notion 0 défauts.
• Faire participer l’ensemble du personnel.

Cette approche est appliquée dans les établissements de soins à l’échelle de l’unité ou dans le champ de la qualité spécifique, en se basant principalement dans cette approche sur la roue de Deming, « PDCA-Plan Do Check Act »
Évaluation des différents modèles

Les outils de contrôle à postériori restent les moins efficaces, en effet dégager le problème après sa survenu ne suffit pas pour assurer la qualité des soins, car ils ne permettent pas d’anticiper les défaillances et erreurs.

Les méthodes de l’assurance qualité sont perçues d’une manière contrastée, les audits des professionnels de santé sont efficaces et contribue à l’amélioration des pratiques professionnelles, et sont facile à accepter par les acteurs de soins notamment les médecins, tandis que l’efficacité de l’outil de l’accréditation est toujours remise en cause, et n’est pas facile à tolérer par les médecins qui exigent une autonomie professionnel, et affirment que ce n’est qu’une machine administrative lourde en application.

Les outils liés à la qualité totale, principalement le PDCA ont donné de bons résultats au niveau de l’amélioration de la qualité des soins, ceci dit leur application est restreinte à des unités ou domaines spécifiques.

La réussite des facteurs et méthodes de qualité au milieu hospitalier demeure un sujet qui exige encore plus de recherches afin de rapporter des réponses plus claires.

Aux États-Unis, une étude publiée en 2011 développe un modèle conceptuel; le modèle MUSIQ (Model for understandingsuccess in quality) qui identifie cinq catégories de facteurs qui contribuent au succès d’un management qualité, ces catégories sont: l’environnement externe, l’organisation elle-même, les microsystèmes, les équipes de soins et des facteurs divers tels que des événements marquants ou le développement de plans stratégiques.

D’autres recherches sont toujours effectuées dans ce sens, car le domaine de soins attend toujours des réponses plus précises sur les facteurs de succès de la qualité des soins.

Les trois méthodes de l’amélioration de la qualité conçues dans le domaine industriel ont tous été adoptés dans le milieu hospitalier, le contrôle final et l’assurance qualité sont l’une des méthodes qui ont été acceptées par les professionnels de santé mais leur efficacité reste incertaine. Le modèle de la qualité totale a prouvé son efficacité mais à un niveau spécifique (unités de soins ou qualité spécifique), son efficacité dans tout le système de soin reste à discuter.

IX. Conclusion

A travers cet article, nous avons défini les bases de la qualité des soins et les points essentiels pour son application dans le milieu hospitalier pour enfin identifier les bases et méthodes tirés de la qualité industrielle et appliquées dans le management hospitalier.

Nous concluons que la mise en place d’un système de management de la qualité nécessite l’application et le respect des principes fondamentaux.

La réussite de la conception et l’exécution d’un système de management de la qualité hospitalière demande un changement organisationnel, mais aussi l’implication du personnel et l’investissement des moyens humains et matériels.

Bibliographie

8. (s.d.).
Improvement on Packaging and Referencing Tuberculosis Samples- Experience in Zambezia, Mozambique

By D. Malamule, E. Manguene, B. Mutandiua, C. Madeira, A. Abdula, J. Conjera, I. Nasseco, S. Viegas, A. Baptista & J. Melo

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Abstract- With 552 new cases of tuberculosis (TB) per 100,000 people per year, Mozambique is among the 14 countries globally with the highest estimated incidence of TB; however, Mozambique has one of the lowest case-detection rates in the world, identifying only 45% of all estimated cases of TB, well below the World Health Organization (WHO) target of 70%. In Mozambique, as in other low-income countries, missed cases of TB have been attributed in part to difficulties transporting TB samples quickly and appropriately. A secure referencing system of biological samples from the periphery health facilities to referral labs at the district/provincial/central level is crucial to ensure access to Tuberculosis (TB) tests with timely and reliable results within the diagnostic network. Sputum spillage of 6% is a challenge faced during sputum referral and transportation system in Zambezia Province in Mozambique. It is common that samples are packed in inappropriate closed boxes, resulting in spillover and loss with high biological risk of possible primary TB transmission.

Keywords: referral, packaging, sample, tuberculosis.

GJMR-K Classification: DDC Code: 616.995 LCC Code: RC311

Improvement on Packaging and Referencing Tuberculosis Samples Experience in Zambezia Mozambique

Strictly as per the compliance and regulations of:
Introduction

Equitable access to quality and timely diagnosis linked to appropriate care is critical for ensuring health for all. However, access to testing is the weakest link across the patient care-seeking pathway [1]. On the other hand, specimen referral systems play a critical role in ensuring access to laboratory services by allowing patients to receive care and treatment at one location, while their specimens are transferred to various levels of a tiered laboratory system for testing [2].

Delivering patient-centred and equitable diagnostic testing services is complex. Despite significant investments over the past decade to strengthen diagnostic systems, particularly for HIV and tuberculosis (TB), critical gaps and weaknesses remain [3, 4, 5].

Referral systems can efficiently increase access to diagnostics in areas where testing is not available, prevent the need and associated costs for patients to travel, and lead to equity in access to health care. Furthermore, tests centralized or regionalized testing and a robust specimen referral system may be more cost-effective than placing staff, procuring, and maintaining equipment to conduct testing at lower levels [2].

The goal of a diagnostic network to deliver the right amount of testing, in the right place, at the right time, for the right people and at an affordable and sustainable cost, ensuring that accurate test results are delivered in a timely manner to inform patient care and public health decision-making, on a scale consistent with national goals and strategies. The present study aimed to evaluate the efficiency of the new secondary package for biological sample, locally developed in Maputo-Mozambique to respond the challenge of spillage, reducing the loss of sputum for TB diagnostic.
II. Method

a) Study design and area

To prevent spillage of samples, Local TB Response (LTBR)/FHI360 collaborated with National TB Reference Laboratory (NTRL) to design and pilot use of individualized, water and leak-proof insulated secondary packaging and ensure triple packaging for TB specimens transport as recommended. The secondary packaging was piloted in 5 districts of Zambezia province (Quelimane, Namacurra, Morrumbala, Lugela and Pebane), two with good access roads and other three with poor access roads, what may contribute to increase samples spillage during twelve weeks. LTBR ADPP activists and motorbike riders were trained on usage of the secondary package to transport sputum samples from remote communities and/or peripheral Health Facilities to Health Facilities with laboratory services, using bicycle and motorbikes with cooler boxes.

b) Brief Information about Zambezia

Zambezia Province is located in central Mozambique, bordered by Nampula and Niassa Provinces to the North, Malawi and Tete Province to the West, Sofala Province to the South and the Indian Ocean to the East. It has an area of 105,008 Km², with Quelimane as its capital city. The Province is divided in 22 Districts and 6 Municipalities. As of 2017, Zambezia has a total population of 5,164,732, which is equivalent to roughly 19% of the national population (INE). About 52.05% of the population is female. The economy is dominated by subsistence agriculture; a few of the cash crops include cashews, sesame seeds and cotton. Artisanal fishing and livestock production are also important subsectors in the socioeconomic life of the population for employment, income and food security. Other important sectors include tourism (eg Gilé National Reserve, Namuli Mountain and Primeiras e Segundas Environmental Protected Area), trade and manufacturing. Zambezia Province is responsible for 9% of Mozambique’s Gross Domestic Product (GDP) and 61.76% of the population of the Province is living below poverty line [6].

c) The role of community activists selected

Local staffing requirements were identified and a programme of staff training was developed. Local community outreach worker was prior employed through the project TB Response in order to access all affected communities with known or suspicious TB cases. For this study, we used the same people and in meantime, laboratory technician and a TB coordinator were appointed and trained on use of the secondary package.
Using approach for tuberculosis treatment, the activists hired by TB Response play a similar role as DOTS in tuberculosis treatment and control. Basically, they are well-trained health care worker or other designated individual (excluding a family member) who provides the prescribed TB drugs and watches the patient swallow every dose, gives instruction on sample collection and follow the contacts of people with DR TB or DS TB, delivering the prescribed medication, checking for side effects, watching the patient swallow the medication, documenting the visit and answering questions.

The strategy has been successful, it helps prevent TB from spreading to others, decreases the risk of drug-resistance resulting from erratic or incomplete treatment, decreases the chances of treatment failure and relapse.

The big challenge noted during these activities was the boxes used by the activists to transport sputum from the community to health facility avoiding spillage. Because of improvised boxes got from the pharmacy, not all sample reached the lab properly for testing and some were rejected.

To evaluate the efficiency of the new developed secondary package vs improvised boxes, specific forms were adopted to record in the lab when sample were delivering. In each district, not all activists received the new box to allow comparison result. It is, if a district selected had 4 or 5 activists, only 2 received the new boxes and others still using the improvised. It was a group control with new boxes and study group with the improvised boxes.
III. **RESULTS**

The outcomes of usage of the new package could be evaluated after three months of pilot from April to June 2022, when the sample was transported in both ways as explained above. To improve TB sample referring system in the 4 supported provinces, TB Response Project in collaboration with the National Tuberculosis Reference Laboratory designed a compartmentalized and robust secondary packaging to prevent spills in 5 districts of Zambezia piloted by Activists and motorbike riders.

During the pilot, 2689 TB sample was transported and only 46 were rejected in the laboratory due to spillage using the improvised boxes. Data’s were weekly reported and analyzed per district as we can see below.
Two districts (Morrumbala and Namacurra) have 0 rejections. The Health facility with more rejected samples were Impaca (6) and Naburi (5) both in Pebane district, all associated with the improvised boxes. No spillover or rejected sample notified for all districts, using the new secondary package.

Namacurra was the district that had a lot of irregularity in the report, having reported data only in weeks 1, 3, 5, 9 and 12. A total of 108 originated were referenced, without any rejection.

Comparing the improvised boxes used by the activists and motorbike riders, we can see that they are not appropriate leak-proof seal. In case of spill is common to lose the patient opportunity to test and minimize the chance of spreading TB. Although the first approach in packaging sample must be follow the international standards, related to triple packaging as recommended, the required material is scarce in the country. This is why people try to adopt easy solution to deliver the samples for testing.

**IV. DISCUSSION**

The interpretation of the microbiological results depends, to a great extent, on the quality of the samples received for study. Therefore, an appropriate management of the samples is necessary to achieve an optimal diagnosis in Microbiology [7]. The analyzable substances are all the biological samples available, from sterile fluids, samples from different organs or systems, such as faeces, urine, sputum, Broncho alveolar lavage, aspirates, biopsies and exudates from different locations or superficial or deep lesions, and hospital devices, such as catheters and prostheses [8].

There is a great variety of containers in which microbiological samples can be collected, with a common characteristic to all of them being that they are sterile and with a leak-proof seal [7]. The issue in the process of sample transportation, a part of the type of container, avoid spillage must be considered. As in other low-income countries, missed cases of TB have been attributed in part to difficulties transporting and handling TB specimens and Mozambique is not an exception [9]. Road infrastructure is poor and at times impassable and also contribute for spill increasing and loss of specimen [10].

The handling of the samples should only be carried out by trained and qualified personnel, who should also be in charge of their safekeeping and organization of the transportation [11]. Since samples are transported by couriers who do not take care of the samples and sometimes do not show evidence of training in biological sample management, this may be associated with the high number of spills, given the road situation also.

To transport all infectious substances, the basic triple packaging system must be used. This transport system comprises three layers: Primary container, which is the primary leak-proof and watertight container that contains the sample. This container should be wrapped in absorbent material with the capacity to absorb all the fluid in case of breakage or leakage; Secondary container, resistant, watertight, leak-proof container that encloses and protects the primary container. Several wrapped primary containers can be placed in a secondary container, but sufficient absorbent material must be used to absorb all the fluid in case of breakage or leakage and Outer container, where the secondary
containers are placed in outer transport packages provided with a suitable cushioning material. The outer containers protect the contents from the external elements, such as physical damage, while the package is in transit [12].

Given the severity of the TB epidemic, innovative solutions are needed to ensure that patients have the diagnosis needed for clinical management and for public health measures [13]. Considering the different situations of spill management, safe transport of samples and safety of personnel, the secondary packaging was designed with the objective of covering these needs identified during the process of sending samples in the country.

Everyone has a responsibility to manage the potential for occupational exposures. Responsibility for the cleaning of body fluid spillage should be clear within each care setting. Following a spill, sampling programs play a vital role in documenting the extent of contamination and providing valuable information to inform clean-up strategies [14].

V. Conclusion

The use of the secondary packaging by activists and motorbike riders are substantially improving TB sample referencing and reducing dramatically spillage. The stroke rate also remained at 2%. Eighty-nine percent (89%) of the rejected samples are caused by spills due to the use of TDR boxes, improvised for the transport of samples.

References Références Referencias


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Measure the Specialized Quality of Services Provided by the Hospitals and Overall Satisfaction of the Patients of Select Multi – Speciality Hospitals in Coimbatore City

By Dr. M.R. Chandrasekar

Abstract- The present study has empirically investigated of measure the specialized quality of services provided by the hospitals and overall satisfaction of the patients of select multi – speciality hospitals in Coimbatore city. The study also considered Parasuraman, Zeithaml and Berry have identified the service quality as crucial (Reliability, Responsiveness, Assurance, Empathy, Tangibles). Hence the present study focused on Patients’ Satisfaction framed (Parasuraman et al.) by incorporating modifications according to the native settings and to measure the level of satisfaction towards specialized services and DNC services (Doctors, Nursing and Clinical). These are included in the study to fill in the research gap which is not specifically handled with the service quality aspects and satisfaction dimensions also. The study was undertaken to find out whether the hospital (Multi – speciality Hospitals) under study has any systematic management system followed for providing better services to its customers (patients). For this purpose, a structured questionnaire was designed to collect information from the patients of Hospital in Coimbatore city. Therefore, the objective is to study patient satisfaction towards services rendered by the select multi-specialty hospitals in Coimbatore city. The research design of this study is descriptive research.

Keywords: inpatients, service quality of the hospitals, patients’ satisfaction and DNC services.

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Keywords: inpatients, service quality of the hospitals, patients' satisfaction and DNC services.

I. Introduction of the Study

Medical assistance is a need for each and every human being irrespective of demographic or social settings. Health problems pose a serious threat to health, and require specific treatment and management to cure the problem. Medical care aims not only at improving health status but also to respond to patient needs and wish to ensure their satisfaction with care. The quality of service by a hospital is the number one factor that will either turn a customer/patient away or ensure satisfaction and faith. More and more hospitals are competing for greater shares in the market, and customer-driven quality management is becoming the preferred method for improving the performance of hospitals. Patient judgement on medical care also contributes to medical outcomes. In the case of in-patient care, it has been clearly shown that satisfied patients are more likely to cooperate with treatment, to maintain a continuing relationship with a practitioner and thus enjoy a better medical prognosis. This happens consistently in multi-speciality hospitals which adequately provide support to patients.

Service Quality is defined as a “Global judgment or attitude relating to the overall superiority of the service” (Parasuraman et al.). In service organizations, customer perceived service quality is considered as one of the key determinants of business performance (Parikh). The issue of how best to conceptualize and operationalize service quality is still a subject of heated debate (Cronin and Taylor). However, it is generally agreed that Service Quality is a multi-dimensional or multi-attribute construct. Good service quality means that the customers’ perception on service performance meets or exceeds their expectations or what the service firm should provide. The applicability of SERVQUAL in a different culture is to be considered. Consumers varied in both their overall expectations with regard to service quality and their expectation of each of the service quality dimensions as a result of cultural orientation.

II. Objective of the Study

1. To measure the specialized quality of services provided by the hospitals and overall satisfaction of the Patients of select multi – speciality hospitals in Coimbatore.

III. Statement of the Problems

Hospital is a place where people who are ill or injured are treated and taken care of by specialized doctors, staff and nurses. In the past, the hospitals were set up as charity institutions, especially for poor and weaker sections. The only function of those institutions was to care for the sick and poor. The patients also approached the hospitals with disinclination, anxiety and
fear of death, but today the hospitals are set up with a motto to serve all sections of the society. The set-up of the hospitals has been spoiled by preferential treatment. Some hospitals are running with below average staff and doctors, and the hospitals are under-utilizing their staff due to improper management, policies and other medical requirements. In other words, the managerial administrative atmosphere is sick at times. Most of the patients often prefer medical treatment in Government hospitals, some private clinics, dispensaries and primary healthcare centers, while they fail to provide quality health care services both the curative and promotive cares and some of them offer poor quality service. The above scanning of the problems reveals that the concept of health services has changed a great deal. Thus, there is a widespread belief that better management of health services is essential if higher quality health care services both the curative and promotive cares will lead to greater success. Best services will lead to greater success.

IV. Need for the Study

The service industries, so as to bring themselves to a better position in the market, promote promotional programs, provide advanced equipment’s and render high quality services to their patients. It is also important to note here that only if these services are able to create a good positive impact on the target group, they will be successful and vice-versa. In this study the opinion was collected from the patients of select multi-speciality hospitals in Coimbatore city.

V. Hypothesis of the Study

- There is no significant difference between hospitalization of in-patients for treatment and specialized services (T-Test and ANOVA).
- There is no significant difference between demographic variables and patients.

VI. Literature Review

Sharama O.P. (1970) in his research concludes that in the present era of scare hospital resources, high cost of hospital operations and increasing demand of hospital services, the development of patient satisfaction assumes great significance for the hospital administrations. The public, general patients and their relatives can be almost fully satisfied in existing conditions available in hospitals. The study suggests no extra funds are necessary. Change in attitude and approach is required. Fitzpatrick and Hopkins (1983) stated that expectations have affective and cognitive components and are multidimensional. They are the result of complex cognitive processes, modified by previous experiences and other influences. Some investigators focus on what patients think will happen (probability or realistic expectations) and others on what patients would like to happen (value or ideal expectations). Predicted or expectancy probability expectations are judgments about the likelihood of an event occurring, for example based on past experience, self-confidence or perceived difficulty of the goal.

a) Service Quality

The position of the patient in the hospital is that of a paying guest. The person going to medical attention provisions for physical comfort and protection. Every arrangement and every people working in the hospital are aiming at the same goal of patient care. Therefore, the service quality dimension.

b) Dimensions of Service Quality

- **Tangibles**: The appearance of physical facilities, equipment’s, appearance of personnel and communication materials.
- **Reliability**: The ability of hospital to perform the promised service dependable and accurately (that is, when something is promised, it is done and provision of services at the time promised). Responsiveness: The willingness of hospitals personnel to help (patients) and provide prompt service.
- **Assurance**: The knowledge and courtesy of hospital employees and their ability to inspire trust and confidence.
- **Empathy**: The caring individualized attention the hospital provides to its customers (patients) (that is, employees understand specific needs and employees give personal attention).

VII. Research Methodology

The objective and systematic method of finding solution to a problem systematic collection, recording, analyzing, interpretation and reporting of information about facts of a phenomenon under study”. The sources of data included both primary as well as secondary data. Questionnaires were used for the primary data collection whereas secondary data collection was made based on the information provided by the hospital officials. Questionnaire was adopted as research instrument. The questionnaires were administrated through distribution specific to the patient’s undergoing treatment in the select multi-speciality hospitals. The survey was conducted among various patients who are specifically taking treatment in the select multi speciality hospitals in the study area. The sample size of the study is 810 inpatients. The sampling technique selected for the study is on multi stage sampling method. The researcher has circulated the instrument only to the in-patients for data collection. The objectives framed for the present study formed the basis of the identification of the relevant statistical techniques such as Structural Equation Modeling (SEM) with the support of AMOS 16 to deliver statistical implications.
VIII. Limitations of the Study

The respondents felt time and cost constraints during data collection. The study is conducted to know the facilities provided in the hospital of the patient’s views and the information provided by the patients are expected with some personal bias.

IX. Analysis and Results

This study attempted to understand the reasons for taking the services from select multi-specialty hospitals for which categorical variables are classified based on illness, treatment, affordability and service quality aspects. Followed by descriptive statistics using weighted mean, three specialized service quality constructs viz (DNC) Doctor, Nursing and Clinical services are analyzed along with the overall satisfaction of the services provided by the select hospitals as dependent variable are further compared using correlation and regression analysis.

X. Model and Conceptual Framework

A theoretical model is projected to compute the Service quality with regards to Patients Perception and Expectation heading to overall Satisfaction of Services delivered excellently by private multi-specialty hospitals of Coimbatore City. The intermediation outcome is calculated by means of unique service provisions such as Doctors, Nurses and Clinical services. The dependent variable is the Overall Satisfaction of the patients surveyed and model computed by means of Structural Equation Modeling (SEM) with the support of AMOS 16 to deliver statistical implications.

Conceptual Model Measuring Direct and Mediation Effect of Patients Service Quality Perception and Overall Satisfaction Mediated by Specialized (DNC) Services

a) Descriptive Statistics on Specialized Services (Doctors, Nursing and Clinical Quality + Safety)

Frequency is measured for three constructs in which agreement level was found to be the dominant among patients’ opinion towards doctors, nurses and clinical services is also considered as DNC services. Therefore, for the likert type five-point scale all positive set of items carry weightage from 5 to 1 for the agreement to disagreement levels therefore an appropriate rank using a weighted average is computed that explains the best and least rating by the patients for all three constructs.

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Strongly Disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly Agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The doctors are always kind and caring about my health that makes me feel easy to get medical care in the hospital</td>
<td>Count</td>
<td>64</td>
<td>115</td>
<td>115</td>
<td>159</td>
</tr>
<tr>
<td>Row N %</td>
<td>7.90%</td>
<td>14.20%</td>
<td>14.20%</td>
<td>19.63%</td>
<td>44.07%</td>
</tr>
</tbody>
</table>

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Measure the Specialized Quality of Services Provided by the Hospitals and Overall Satisfaction of the Patients of Select Multi – Speciality Hospitals in Coimbatore City
Patients’ opinion towards specialized doctors’ services reveals that the doctors are always kind and caring about the patient health which makes the patients to feel easy to get medical care in the hospital for which 44.07% strongly agreed, 19.63% agreed, 14.20% disagreed and opined neutral and the remaining 7.90% strongly disagreed to the statement. Patients’ opinion about doctors exhibits professional skills and elevates trust in the hospital for which 33.70% strongly agreed, 19.26% agree, 25.93% opined neutral, 14.20% disagreed and 6.91% strongly disagreed. Patients’ opinion about doctors and nurses team work reassures the expected quality of service in the select hospitals for which 37.53% strongly disagreed, 17.04% opined neutral, 16.30% agreed, 16.17% strongly agreed and 12.96% disagreed. Patients’ opinion about doctors properly diagnoses and explain the disease and further treatment in the select hospitals for which 42.35% strongly disagreed, 19.63% stated neutral, 18.64% disagreed, 10% strongly agreed and 9.38% agreed. Patients’ opinion about doctors are neither haste nor rude to detail of the patient about health condition and duration of stay for treatment for which 29.38% opined neutral, 19.51% strongly disagreed, 19.26% strongly agreed, 17.41% agreed and 14.44% disagreed. Patients’ opinion about doctors visiting the patients as a daily routine and also ensures immediate attention in case of emergencies for which 38.89% strongly disagreed, 21.60% disagreed, 20% disagreed, 11.85% agreed and 7.65% strongly agreed.

Patients’ rating on doctors service construct and subsequent ranking using weighted average shows first rank towards “The doctors are always kind and caring about my health that makes me feel easy to get medical care in the hospital: \( M = 3.77 \)” followed by “Doctors exhibit professional skills and elevates trust in the hospital: \( M = 3.58 \)” followed by “Doctors and nurses team work reassures the quality of service in this hospital: \( M = 2.60 \)” then “The doctors always properly diagnose and explain the disease and further treatment: \( M = 2.26 \)” followed by “The doctor is neither hasty nor rude to detail the patient about the health condition and duration of stay for treatment: \( M = 3.02 \)” then “The doctor’s visit the patients as a daily routine and also ensure immediate attention in case of emergencies: \( M = 2.29 \)” and finally “The doctors always properly diagnose and explain the disease and further treatment: \( M = 2.19 \)”
disease and further treatment: M=2.26°. Cronbach’s value (α=0.844) shows high reliability for the doctors’ service construct.

### Nursing Services (Frequency Analysis)

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>The nurses treat me with courtesy and respect</td>
<td>Count 475</td>
<td>123</td>
<td>118</td>
<td>58</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>Row %</td>
<td>58.64%</td>
<td>15.19%</td>
<td>14.57%</td>
<td>7.16%</td>
</tr>
<tr>
<td>The nurses listen carefully to me when I address any problem</td>
<td>Count 461</td>
<td>161</td>
<td>93</td>
<td>49</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Row %</td>
<td>56.91%</td>
<td>19.88%</td>
<td>11.48%</td>
<td>6.05%</td>
</tr>
<tr>
<td>The nursing staff respond immediately to my call bell</td>
<td>Count 493</td>
<td>144</td>
<td>110</td>
<td>33</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Row %</td>
<td>60.86%</td>
<td>17.78%</td>
<td>13.58%</td>
<td>4.07%</td>
</tr>
<tr>
<td>The nurses explain things in a way that I could understand</td>
<td>Count 399</td>
<td>182</td>
<td>139</td>
<td>52</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Row %</td>
<td>49.26%</td>
<td>22.47%</td>
<td>17.16%</td>
<td>6.42%</td>
</tr>
<tr>
<td>Sufficient nurses are on-duty to assist the patients in the hospitals</td>
<td>Count 453</td>
<td>126</td>
<td>151</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>Row %</td>
<td>55.92%</td>
<td>15.56%</td>
<td>18.64%</td>
<td>4.94%</td>
</tr>
<tr>
<td>I have confidence and trust in the nurses treating me</td>
<td>Count 531</td>
<td>105</td>
<td>110</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Row %</td>
<td>65.56%</td>
<td>19.66%</td>
<td>13.58%</td>
<td>3.95%</td>
</tr>
</tbody>
</table>

Patients’ opinion towards specialized nursing services in the select hospitals reveals that the nurses treat patients with courtesy and respect in the select hospitals for which 58.64% strongly agreed, 15.19% agreed, 14.57% opined neutral, 7.16% disagree and the remaining 4.44% strongly disagreed. Patients’ opinion is that the nurses listen carefully to patients when they address any problem in the select hospitals for which 56.91% strongly agreed, 19.88% agreed, 11.48% opined neutral, 6.05% disagreed and 5.68% strongly disagreed. Patients’ opinion is that nursing staff respond immediately to patients call bell for which 60.86% strongly agreed, 17.78% agreed, 13.58% opined neutral, 4.07% disagreed and 3.7% strongly disagreed. Patients’ opinion is that staff nurses explain things in the way that the patients could understand for which 49.26% strongly agreed, 22.47% agreed, 17.16% opined neutral, 6.42% disagreed and 4.69% strongly disagreed. Patients’ opinion on sufficient staff nurses are on duty to assist the patients in the hospitals for which 55.92% strongly agreed, 15.56% agreed, 18.64% opined neutral, 4.94% disagreed and 4.94% strongly disagreed. Patients’ opinion on having trust and confidence in the treatment given by nurses in the select hospitals for which 65.56% strongly agreed, 12.96% agreed, 13.58% opined neutral, 3.95% disagreed and 3.95% strongly disagreed.

### Nursing Service (Weighted Mean)

* (α=0.875)
The nurses explain things in a way that I could understand. Sufficient nurses are on-duty to assist the patients in the hospitals. I have confidence and trust in the nurses treating me. Patients rating on nursing service construct and subsequent ranking using weighted average shows first rank towards “I have confidence and trust in the nurses treating me: M=4.32”; “The nursing staff respond immediately to my call bell: M=4.28”; “The nurses treat me with courtesy and respect: M=4.16”; “The nurses listen carefully to me when I address any problem: M=4.16”; “Sufficient nurses are on-duty to assist the patients in the hospitals: M=4.13”; “The nurses explain things in a way that I could understand: M=4.05”. Cronbach’s value (α=0.875) shows high reliability for the nursing service construct.

Clinical Quality and Safety Services (Frequency Analysis)

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Strongly</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical services are intentionally patient-centered</td>
<td>Count</td>
<td>126</td>
<td>177</td>
<td>236</td>
<td>170</td>
</tr>
<tr>
<td></td>
<td>Row N %</td>
<td>15.56%</td>
<td>21.85%</td>
<td>29.14%</td>
<td>20.99%</td>
</tr>
<tr>
<td>Effective doctor-patient communication to promote compliance in medication</td>
<td>Count</td>
<td>125</td>
<td>150</td>
<td>310</td>
<td>184</td>
</tr>
<tr>
<td></td>
<td>Row N %</td>
<td>15.43%</td>
<td>18.52%</td>
<td>38.27%</td>
<td>22.72%</td>
</tr>
<tr>
<td>Psychological support to get rid of the emotional anxiety and fear</td>
<td>Count</td>
<td>157</td>
<td>165</td>
<td>330</td>
<td>144</td>
</tr>
<tr>
<td></td>
<td>Row N %</td>
<td>19.38%</td>
<td>20.37%</td>
<td>40.74%</td>
<td>17.78%</td>
</tr>
<tr>
<td>I feel healthy and protected environment to ensure patients safety and effectiveness of the hospital</td>
<td>Count</td>
<td>84</td>
<td>190</td>
<td>304</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>Row N %</td>
<td>10.37%</td>
<td>23.46%</td>
<td>37.53%</td>
<td>25.06%</td>
</tr>
<tr>
<td>The hospital guarantee safety to dispose hazardous medical waste</td>
<td>Count</td>
<td>82</td>
<td>141</td>
<td>315</td>
<td>237</td>
</tr>
<tr>
<td></td>
<td>Row N %</td>
<td>10.12%</td>
<td>17.41%</td>
<td>38.89%</td>
<td>29.26%</td>
</tr>
</tbody>
</table>

Patients’ opinion towards specialized clinical services in the select hospitals reveals that the clinical services are intentionally patient-centered for which 29.14% opined neutral, 21.85% disagreed, 20.99% agreed, 15.56% strongly disagreed and the remaining 12.47% strongly agreed. Patients’ opinion about the effective doctor patient communication to promote compliance in medication shows 38.27% opined neutral, 22.72% agreed, 18.52% disagreed, 15.43% strongly disagreed and the remaining 5.06% strongly agreed. Patients’ opinion about psychological support to ally the emotional anxiety and fear shows 40.74% opined neutral, 22.72% agreed, 18.52% disagreed, 15.43% strongly disagreed, and the remaining 17.78% agree and the remaining 1.73% strongly agreed. Patients’ opinion about feeling healthy and protected environment to ensure patients safety and effectiveness of hospital shows 37.53% opined neutral, 25.06% agreed, 23.46% disagreed, 10.37% strongly disagreed and the remaining 3.58% strongly agreed. Patients’ opinion about the hospital guarantee safety to dispose hazardous medical waste shows 38.89% opined neutral, 29.26% agreed, 17.41% disagreed, 10.12% strongly disagreed and the remaining 4.32% strongly agreed.
### Clinical Quality and Safety Service (Weighted Mean)

<table>
<thead>
<tr>
<th>Opinion</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical services are intentionally patient-centered</td>
<td>2.92</td>
<td>1.243</td>
<td>2</td>
</tr>
<tr>
<td>Effective doctor-patient communication to promote compliance in medication</td>
<td>2.83</td>
<td>1.098</td>
<td>4</td>
</tr>
<tr>
<td>Psychological support to get rid off the emotional anxiety and fear</td>
<td>2.62</td>
<td>1.040</td>
<td>5</td>
</tr>
<tr>
<td>I feel healthy and protected environment to ensure patients safety and effectiveness of the hospital</td>
<td>2.88</td>
<td>1.014</td>
<td>3</td>
</tr>
<tr>
<td>The hospital guarantees safety to dispose hazardous medical waste</td>
<td>3.00</td>
<td>1.022</td>
<td>1</td>
</tr>
</tbody>
</table>

Patients rating on clinical service construct and subsequent ranking using weighted average shows that the first rank towards “The hospital guarantee safety to dispose hazardous medical waste :: M=3.00”; “Clinical services are intentionally patient- centered :: M=2.92”; “I feel healthy and protected environment to ensure patients safety and effectiveness of the hospital ::M=2.88”; “Effective doctor-patient communication to promote compliance in medication :: M=2.83” and finally, “Psychological support to ally (get rid of) the emotional anxiety and fear :: M=2.62”. Cronbach’s value ($\alpha=0.846$) shows high reliability for the clinical service construct.

### XI. Suggestions and Recommendations

- Employee discipline and appearance were satisfying the tangibility aspects not only at the individual level but also at the hospital administration level. Still, patients’ feel that the multi-speciality hospitals should concentrate neatness, Hospital-acquired infections increase the risk of death and disease, and add to the cost of care and the duration of stay in a hospital. Standard precautions are essential to prevent hospital-acquired infections. These include washing hands with soap and water or alcohol-based hand rub before and after examining a patient, safely storing and disposing of infectious waste and sharp objects, and sterilizing and disinfecting instruments it controls the communicable spreading disease in the hospitals.

- The selected multi-speciality hospitals give reliability to the in-patients as they were satisfied with the staff accessibility, immediate response on calls or emergency. Though, few patients feel that hospitals should give more attention to the emergency patients with priority and readiness.

### XII. Conclusion

In present scenario, different types of hospitals face a lot of problems and the patients are the ultimate sufferer. The most of the patients often prefer medical treatment in Government hospitals, few in private clinics, dispensaries and primary healthcare centers, while they fail to provide quality healthcare services. So that I purposively select multi-speciality hospitals, to measures the patient’s perception and expectation of Service Quality (SERVQUAL) scale according to the native settings and to measure the level of satisfaction towards specialized services and DNC services (Doctors, Nursing and Clinical). Healthcare system is a noble cause for the society while the three services such as Doctors’ Services (professional), Nursing Service (Assisting professional) and Clinical Services (supporting in all spheres such as administration, safety of patients, etc.). Hence modern healthcare services have to be improved a lot more than from what they were used to be few years ago. Patients in the modern days are not merely patients suffering from ailments; they are in search of treatment options, with good service related to their health and well-being. A good health care service will definitely assure higher level of patients’ satisfaction than the difference identified from the results. Therefore, considering these suggestions will further help to improve the facilities to retain the goodwill of the hospitals lending to the welfare of the society.

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Empowering Public Health Nurses for UHC, Perspectives on Effectiveness of Leadership Hubs

By Dan C.O. Kaseje, Beverly M. Ochieng, Eulalia Kahwa & Nancy Edwards

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Abstract- Nurses, as key stakeholders and linchpins in the provision of quality care in lower and middle-income countries, tend to be absent from research and policy processes. Their contribution to the health policy processes is constrained by limited meaningful engagement with other professionals. Policies developed without nursing input may lack essential information about systems gaps and strengths.

A leadership hubs intervention involving four stakeholder groups - nurses and nurse managers; researchers; community representatives; and decision makers was implemented in four countries (Jamaica, Kenya, South Africa and Uganda) to stimulate vertical and horizontal leveraging within and across levels of power and authority. The aim was to enhance nurses' engagement in evidence-informed policy making by increasing their ability to collaborate and lead within and across specific levels in the health system. This paper describes the model and the perspectives of nurses and other stakeholders on leadership hubs' efforts to achieve change in HIV care policy and practice in the workplace.

Keywords: leadership hubs, leveraging change, connectivity, policy change and quality of care/services, nursing.

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Empowering Public Health Nurses for UHC, Perspectives on Effectiveness of Leadership Hubs

Dan C.O. Kaseje*, Beverly M. Ochieng*, Eulalia Kahwa & Nancy Edwards

Abstract: Nurses, as key stakeholders and linchpins in the provision of quality care in lower and middle-income countries, tend to be absent from research and policy processes. Their contribution to the health policy processes is constrained by limited meaningful engagement with other professionals. Policies developed without nursing input may lack essential information about systems gaps and strengths.

A leadership hubs intervention involving four stakeholder groups - nurses and nurse managers; researchers; community representatives; and decision makers was implemented in four countries (Jamaica, Kenya, South Africa and Uganda) to stimulate vertical and horizontal leveraging within and across levels of power and authority. The aim was to enhance nurses’ engagement in evidence-informed policy making by increasing their ability to collaborate and lead within and across specific levels in the health system. This paper describes the model and the perspectives of nurses and other stakeholders on leadership hubs’ efforts to achieve change in HIV care policy and practice in the workplace.

Methods: Qualitative methods were used to examine hub experiences among the network of leadership hubs, within the workplace and in the healthcare system regarding the perceived impact of hubs and successes and challenges with system networks and linkages. Three focus groups were conducted in each country. Bi-monthly progress reports and field notes about hubs were prepared by each country.

Findings: Participants recognized the benefits of horizontal and vertical connectivity, thus leveraging change through evidence-based policy processes. Nurses developed more interest in research and policy. They experienced growth in their careers towards greater autonomy in decision making through inter-connectivity within and across levels of authority and power in the health system. Nurses reported improvements in quality of services and policies for action-oriented initiatives they identified and led.

Conclusion: The study demonstrated the potential of leadership hub empowerment model to improve knowledge, skills, resources, participation and influence in decision-making processes within workplaces and at the health system level. The study lends support for our model of evidence-based engagement and connectivity.

Keywords: leadership hubs, leveraging change, connectivity, policy change and quality of care/services, nursing.

1. Introduction

Complex and enduring health system challenges such as providing quality care for those living with HIV/AIDS have proven resistant to approaches focused on single system-level inputs (program funding, workplace policies, staff training, or service delivery models). Multilevel engagement requires new kinds of deliberate interconnectedness that brings together actors from different levels (Bryson et al, 2006; McGuire 2006). Vertical and horizontal collaborative approaches are “more flexible, inclusive, and more adaptable to operating with greater speed” (McGuire, 2006). PAHO/WHO (2008) states that in order to address health equity issues novel strategizing about mechanisms that leverage and re-construct individual and institutional linkages of power, authority and expertise within the health system may positively affect service delivery at the frontlines of care.

Nurses and midwives form the backbone of health care systems around the globe, and their contribution is recognized as essential to delivering safe and effective health care, (Martinez & Martineau 1998, Dovlo 2007). They have an obvious contribution to make to broaden the evidence base for policies and practice. However, studies suggest that their technical knowledge and experience do not systematically inform policy decisions (Walker & Gilson, 2004; Juma et al, 2014; Richter et al., 2013). Nurses, as key stakeholders and as linchpins in the provision of quality care tend to be absent from the research processes related to HIV policy development and implementation. This reduces relevance and uptake of research evidence, and affects decisions about resource allocation within resource-constrained systems. The International Council of Nurses has raised particular concerns over the minimal representation of nurses at national, regional, and international health policy forums (ICN 2008).

Nurses have working relationships up and down layers of the health system within ministries of health. They regularly relate to physicians, NGOs active in HIV care, community members and community health...
workers. These linkages could be tapped to galvanize collaborative synergy. However, persisting gender, racial and power relations and historically top-down approaches in nursing and medicine have limited the role of nurses as decision makers and constrained collaboration both within the nursing profession (between nurses at higher and lower levels of authority) and among nurses, physicians, and health system decision makers. Nurses tend to have limited meaningful engagement with other professionals and with political and policy actors and processes across levels of the health system (Asuquo et al. 2013; Juma et al., 2014; WHO, 2006).

Furthermore, although nurses generally are well-prepared educationally and play a leadership role within clinical environments, their contribution to the health policy process is constrained by inadequate research capacity, limited experience with knowledge translation and limited opportunities for dialogue with policy makers and a nurse-centric rather than a health-system orientation to their practice (Phaladze, 2003; Juma, P., Edwards, N., & Spitzer, D. (2014). This paper describes experiences with a “leadership hub” model for enhancing nurses’ engagement in evidence-informed decision-making by increasing their vertical and horizontal linkages within and between levels in the health system and the pathways by which change is achieved. A total of 12 leadership hubs were established from 2009-2012 in four countries (Jamaica, Kenya, South Africa, Uganda) in the project “Strengthening Nurses’ Capacity in HIV Policy Development in Sub-Saharan Africa and the Caribbean” (Edwards et al 2016, Davison et al. 2013, Edwards 2007). Hubs brought together four stakeholder groups - nurses and nurse managers, researchers, community representatives, and decision makers – to stimulate collaborative action on local health challenges. The paper presents qualitative findings on the perspectives of leadership hub members on how their experiences with leveraging vertical and horizontal connectivity evolved over the life of the project, changes that arose in networks and relationships between stakeholders across levels of power and authority, and the impact on nurses’ policy engagement to achieve workplace and health system change.

a) The Leveraging for Change Model

The “leveraging for change” model, which was developed for the project, aimed to empower nurses in research and policy making. This drove the structure of leadership hubs. This model posits that influencing sustainable health systems change requires catalyzing both horizontal and vertical dimensions of knowledge, skills, authority, voice, and influence across a range of stakeholders in the change initiative. The extent of change that occurs is related to both the horizontal level (knowledge and skills at one level of individuals and peers, the extent of diversity) as well as the degree of vertical connectivity – the magnitude of engagement across levels of power within the system hierarchy as well as the difference between the levels involved. Both dimensions contribute to a momentum of change in policy consciousness and influence (Edwards et al 2016).

The connectivity represented in the model draws from the collaborative public management approaches described by (McGuire, 2006; Bryston et al, 2013) suggesting potential synergies that arise by bringing together different actors and harnessing the power across levels of the system. We hypothesized that the interconnectedness across different levels of the system could lead to sustainable improvements to workplace policies and practice. Leadership hubs were formed to deliberately bring together nurses at the same level (horizontal connectivity) and across different levels (vertical connectivity) to address building blocks previously described by WHO (WHO 2008, WHO 2010c, WHO, 2013a). Connectivity referred to building relationships of involvement and participation and engaging nurses beyond traditional reporting structures thereby enhancing their participation in decision making. Capacity building built confidence, skills and prompted engagement.

II. Methods

a) Leadership hubs

Leadership hubs were established in 12 districts/parishes across the four study countries (Kenya, Jamaica, South Africa and Uganda). Hubs were comprised of four stakeholder groups with individual members drawn from varying system levels of authority from frontline positions to nurse managers and decision-makers representing district/parish, regional, and national ministries of health. By bringing the different levels together in to one structure, the leadership hub was expected to address issues that constrain nurses’ policy involvement at their workplaces and in the health system through participatory engagement. This approach was expected to address historical inequities relating to rigid socialization of nurses into implementers of decisions made by others in more powerful positions by virtue of their profession and/or positions.

Each leadership hub was then linked to other leadership hubs in the same country through participation in joint capacity building workshops and leadership hub meetings. Such joint activities occurred more than three times every year. The hubs were linked to other structures such as the local branches of the Nursing Associations, and the District or Parish Health Management teams by being directly represented on the leadership hubs, and local learning institutions. In some countries, hubs were supported-by the project’s
National Advisory Committees which offered additional linking opportunities.

Connectivity was established through regular team meetings, joint training and interpretation of research findings, hub engagement in dissemination of research and policy, communication through newsletters and communiques, face to face and electronic meetings and networking hubs within countries. Further, the leadership hubs were linked across study sites in Africa and the Caribbean through a project quarterly e-newsletter, teleconferences and an international conference.

b) Data collection

Qualitative methods were used to examine hub experiences with horizontal and vertical connectivity among the networks of leadership hubs, within the workplace and in the healthcare system. Three sets of data were drawn upon. Three focus groups were conducted with leadership hubs in each country. The first soon after the leadership hubs were formed, then mid-term and end-point. Interview guides evolved over the research period. The first interviews focused on the purpose of the hubs, members’ expectations and the contributions they brought to the hub. At mid-term, discussions centered on changes in their capacity to undertake and use research in their practice and to influence policy. At the end of the intervention the discussion aimed to examine what influenced their achievements in the workplace environment, what linkages they had built and what challenges they had encountered. The interviews were conducted by co-investigators and research assistants, face to face.

c) Data analysis

Bi-monthly progress reports and field notes about hubs were prepared by in-country research assistants identifying contextual factors, hub activities and challenges, to inform the research team and in-country program directors during the project. A sample of reports (2 per country, one at mid-project and at end of project) were analyzed, by themes and sub-themes guided by study objectives. All interviews were recorded and transcribed verbatim. Matrices were used to identify outputs, outcomes and impact results that hub members described as linked to/associated with intervention elements (e.g. hub meetings, networking activities, mentorship and coaching). Thematic results were organized into a framework that built on and extended the structure of our original leveraging for change model. This allowed us to examine connectivity pathways to change in policy and practice that emerged from our data.

d) Findings

The emerging pathways for policy influence and change that were invoked through the leadership hub model, described by the study participants included: 1. learning mechanisms leading to policy consciousness (e.g. a consciousness about the chain of policy influence), 2. Relationship-building and networking that developed inter and co-dependent connections (horizontal and vertical) to act jointly/as a collective leading to solidarity and gaining legitimacy as policy actors and influencers 3. vantage positioning for participation in policy processes, supporting boundary spanning engagement beyond historical social, gender, and professional hierarchical power relations. Hub members referred to hub experiences that were especially informative and salient. Table 1 summarizes pathways and outcomes of policy influence and change.

Table 2 details the actors who participated in the National Advisory Committee and leadership hubs at all levels (horizontal structures) represented by rows and in the vertical structures, from the pillars of the health system (WHO 2006) represented by columns. Through the hubs the actors were able to relate at same levels, horizontally and across levels, vertically. Leadership hubs facilitated bonding both horizontally and vertically.

As Table 2 shows, the most dominant actors were nurses, mostly managers, as they appeared in most frequently in vertical and horizontal structures. At the national level the least numerical representation on national advisory committees were nurses from the governance pillar. The majority were nurse managers from management structures and health facilities and professional nursing association leaders. No front line nurses participated as members of the national level structures. The leadership hub at the national level was dominated by the national referral health facility level 6, nurse managers.

At the provincial level, the leadership hubs were still dominated by senior nurse managers, and professional nurses with the highest proportion coming from the management pillar, as compared to the national referral level 6 where service delivery nurses were more. Service delivery managers were next in proportion. At this level no governing actors were present in the leadership hubs. Nursing association presence was minimal at this level except for South Africa. Similarly the leadership hubs at the district level, was dominated by nurse managers from the management, service delivery pillars and nursing association pillars, making the district a nodal level in developing connectivity facilitated by leadership hubs. This was the last level at which nursing associations appeared in the hubs. At level 3 nurse managers from the management and service delivery were present. At level 2 participation in leadership hubs was from frontline nurses, this being the last level from which they participated. Actors most challenging to connect with emerge from this picture that there were no governors in the hubs coming from provincial and district levels. Similarly, level 1 was least present in the hubs in most
pills and at most levels. As in table 2 all the pillars, their composition and function occur at all levels, from community to national referral. All the pillars forming the vertical connectivity involve all six levels in the health system in terms of composition and function.

There were country differences in the profile of hub members by levels, suggesting different recruitment strategies in the different countries, with implications for the kind of connectivity and change that hubs would have across levels. For example: Kenyan and Jamaican hubs included representation from higher levels in the health service delivery system, levels 4 and 5 representing a key resource to draw on. South African hubs on the other hand were primarily drawn from much lower levels in the system and therefore lacked this built-in connection with higher-level institutions, this could have led to the differing degrees of success that countries had with establishing and sustaining their hubs, and achieving the kind of change and connectivity that was originally envisioned. In Kenya, a larger number of organizations were represented on the hubs because often there were only 1 or 2 hub members coming from one particular institution. In Jamaica, a smaller number of organizations were represented on the hubs because several members tended to come from particular institutions. This could have impacted on the effectiveness of connectivity and hub success in terms of contribution to organizational change.

e) Learning mechanisms pathway

Policy and leadership training was described. Leadership Hubs provided a powerful learning mechanism which enabled all members to learn from facilitators as well as from one another. Notably participants identified that training was conducted in safe environments, allowing them to build confidence, skills and trust as hub members. Through the learning mechanisms research and policy issues became clearer when the hub members met together with other leadership hubs from other countries since they would learn from the practical experiences of everyone. "And because our leadership hub has different categories and stakeholders that we have encompassed in the leadership hubs, you tend to learn so many things that the other group members will have come with the experience, because of different stakeholders you tend to learn more from their experiences and their knowledge". (South Africa nurse).

Hubs brought together various perspectives, which improved hub members’ understanding of research and policy, decisions and actions. Leadership hubs established interconnections that promoted mutual, experiential, peer learning which proved to be efficient, effective and sustainable based on shared experiences, values and solidarity driven by multilevel, multi-context relationships.

Hub members came to realize that policy making was for everybody and at many levels, home, community and workplace. While participating in the hub project, they realized that hub members could be involved in formulating policies at workplaces. They reported being able to understand the policy process working with frontline nurses. They reported improved ability to interpret and influence the change appropriately. Respondents noted that the hubs had increased their capacity to disseminate policy information, backed by research evidence; since they better appreciated the value of policies in guiding activities in the workplace.

"I think that this hub is learning we would just be able to disseminate more information on a timelier basis"; (Jamaican respondent).

This was enhanced when they started receiving results from the study and were able to relate them to policy issues, such as clinical practice. The other achievement was learning from how hub members passed knowledge and skills to others to change the way things were done. They also achieved integration of services.

"Because now it’s not only that program coordinators are part of this Leadership hub. People that are hands-on, the front line nurses that are also part of this"; (South African respondent).

Respondents appreciated how the research findings could inform their activities. This led to some actions such as sharing policy information to encourage practice improvements, such as those intended to reduce HIV and AIDS stigma and discrimination. Hub members described being able to work together within and between levels of care

"I work in the office, she works in the level three health facility, so I think coming together in this hub has enabled us to understand one another better and even appreciate the issues that come up on policy implementation"; (Kenyan nurse).

This finding suggests that although there are policies but the structures of dissemination and application are not functioning. The hub participants recognized that there are nurses at policy making levels, such as the national chief nurse, represented nurses.

Respondents reported having promoted implementation of a number of existing policies because of hub discussions. "The best clinical services that people talk about will not be the best so long as we don’t have applicable, applied clinical research by nurses. -For nurses to do this, they need to be trained on research methodology and changing their attitudes towards research activities because some would feel that it is hectic and needs a lot of time. So the nurse manager needs to support frontline nurses to conduct as many
Nurse participants spoke of developing a new perspective on their own capacity to engage in policy: “It’s a resource you know, like right now the national nurse leadership are my bosses but I could be having and sharing with them confidently just by talking. We know one another, sharing sometimes even having meals together. You know that one even if you have a problem you have the courage even just to talk to them coz you’re going to see somebody who you have been with” (Kenyan nurse).

Respondents felt that the leadership hubs greatly enhanced their personal and professional development following increased interactions among themselves. Accelerated personal and professional development, enhanced resilience in crises. Some mentioned the benefits of specific learning activities such as an international hub teleconference, organized by the research teams with Kenya, Jamaica and South Africa.

Hub membership enabled them to access policies that were key to their practice but which they were hitherto unaware of. “The stakeholders you can help them during the meeting, here management meetings and you can invite the hospital directors, the head of nursing, the admin or the district health team” said a Jamaican nurse respondent.

Further, they felt able to assess policy statement as Hubs, since they had learnt the processes of developing a policy. “Before the hub we were just looking at such written documents in the shelves but now we know the document are for implementation for good reasons. Besides we can now review them or even formulate our own statements to ensure relevance and effectiveness”, (Ugandan nurse).

Hub membership improved their communication skills, members gained confidence to talk in public. Respondents appreciated opportunity to exchange ideas whenever they met, and a chance to interact with other countries through visits or electronic communication. Being in the hubs made them realize that nurses in other settings faced similar problems. Unity across countries enabled them overcome some problems. Interacting with the partners outside the country added to the effectiveness of their network. “We haven’t been involved in policy formulation but at least now the nurses know what their rights are as regards to HIV/AIDS management. They would demand, demand for protective and which never used to be the case before”, (Ugandan nurse).

Learning pathway outcomes: They expressed evidence of enhanced recognition, respect leading to inclusion in decision making across structures and across settings. They reported being empowered with evidence. “I have managed to relate very well with my colleagues and share with them information concerning infection prevention and I think that was an opportunity for me”.

The leadership hubs enhanced members’ recognition of medical professionals “I could see that they are interested in us making inputs”, (South African nurse).

They reported that being involved in the hub actually earned them respect in the workplace, and leaders sought their opinions when making decisions. Thus, being in the hub had made them more productive. Communication between the hub and supervisors was good, they would remind them of meetings.

"And on our field of working, leave alone nursing, even on the medical profession, most of our bosses like the District Medical officer of Health (DMOH) and senior nursing officers do actually recognize me and somebody with potential which I attribute to the influence brought to me in the nursing profession in the Hub itself”.(Kenyan respondent).

Hub members cited a number of incidents in which they were able to influence decisions “Through collaborations with Ministers of Health, Chief Nursing Office, Ministers office, we have been able to make an impact, especially from the visits we have done with our decision-makers within the healthcare service. The strategic position or placements of the leadership hub members have greatly influenced our interactions, with not just secondary care but also with primary care. And with primary and secondary care we have what we would look at intersectoral collaboration with other persons from the Ministry level as well as the parish level, and local level in dealing with the different issues identify in the policy process”, (Jamaican respondent).

Hub members reported being empowered with evidence: “I have managed to relate very well with my colleagues and share with them information concerning infection prevention and I think that was an opportunity for me”, (Ugandan nurse respondent).

Respondents highlighted that through the hub initiative, the nurses in charge, who were hub members, were empowered with the right information and were therefore able to influence workplace policies to improve clinical practice:

"Then in our meetings, clinical committee meeting, management meeting, we always discuss issues related to HIV/AIDS prevention and management and the... we also budget for some of the protectives that are required in HIV/AIDS” (Ugandan respondent).

Leadership hub members spoke of what they had gained from discussing commonalities and differences in health policies and programs across the study countries: “Yeah, I think we have got to increase the collaboration and networking within hub countries, hub membership
countries and partners in the project. We have shared the knowledge and skills during the teleconferences and we have found that we need to be involved in decision-making, and we have also tried to advocate for policy will be the fact that evidence to be put in action”.

Further, respondents mentioned bringing different districts together to share experiences, members learnt from one another across districts, they gained more confidence as stakeholders in HIV management. They all cited the knowledge of research that they gained from training. Some described a boost in their personal motivation to go further in research and education, to strengthen their capacity for research management. "The fact that we have identified the gap, in terms of creating follow-ups of HIV patients and then we came with the topic on itself to do a project on that problem. I think it is an achievement because if at the end of the research we come up with a solution which could rectify that problem" (SA respondent).

They learnt that stigma was a cross cutting issue, and other new experiences such as the use of community health workers, and birth attendants. "We had a teleconference last year and it was through those discussions that we found out that we had similar problems as it relates to how we involved our nurses in research and nurses in the decision-making process" (SA respondent).

Additionally they learnt how to solve problems and address challenges by sharing experiences with other hub members from other districts. "It has contributed to our hub because somewhere we could be stuck, we do not know how to go on, then you call another hub and ask them how they have tackled this problem then they tell you how they have managed and that can give you an encouragement" (Ugandan respondent).

Some reported that learning problem-solving skills reduced their dependency on other levels or professions at their workplaces. Leadership hubs increased nursing voice in decision and policy making and provided feedback loops critical for continuous improvement in workplace performance. "I would say that the hub give us some level of freedom, feeling of sameness has occurred. When we interact with the people at the provincial level, am saying that there is some level of sameness, equality when you interact with people at the provincial level, the staff at the provincial level that is the Public Health Officer (PHO) office, you interact with the DPHN, i.e. the District Public Health Nurse you feel that you are comfortable and also that you are recognized as a frontline nurse. It breaks the feeling of lowness, the feeling that you are just a mere nurse. It has really strengthened the feeling that even as frontline nurses you can also be heard. You can share on one table, and share your views and ideas and it can be appreciated by nurses of higher level or authority" (Kenyan nurse).

They expressed commitment to policy processes, going forward, because they had been strengthened through multi-disciplinary and cross level inter-connections. "To me as a frontline nurse it has empowered me to talk to other people at my place of work" (Ugandan nurse).

f) Relationship and networking pathway

In all study countries, except South Africa, the formation of the hubs initially proceeded rapidly. Front line members of hubs were quickly involved in capacity-building activities/workshops. Over the course of the project, participants described building relationships across levels in the health system. Respondents felt that they had formed strong teams of shared objectives and had become more responsible in guiding others at workplaces.

The multi-stakeholder composition of the hubs was repeatedly described as important. It provided connectivity both horizontally and vertically. Hubs enabled members of a team to understand each other's work better.

"This is really good for us that we are working together with the other departments because having spoken to doctors and we have spoken to medical technicians, and pharmacists and all the other persons and persons are becoming excited about the whole concept of HIV/AIDS and other policy development that has somewhat become enhanced", Jamaican respondent.

Hub members in all countries described opportunities for interactions at the national level. Both intra- and inter-country communications were identified as important. This included face-to-face meetings, hub newsletters, country communiques and skype calls.

"We have interacted… especially for me it has been a good interaction with the nurses who work at the grassroots. Because some of the hub members came from health centres, and that was a very good experience for me to hear from them and also for us to have our input. I think it has changed their performance; it helps them appreciate their profession and their role in research and policy. Because people think policy is only for those people up there but policy development starts from grassroots". Kenyan respondent.

They explained their interaction with community members because they were represented in the hubs. They explained the linkages among—the community, Ministry of Health, the Nursing Associations and academic institutions. They also described relationships at different system levels and from community to district as they—worked together.

"You realize that at the community it’s not easy to interact, bearing in mind the conflicting roles at the point of
meeting them, Me being a manager I am in contact mostly with the nurse managers, supervisors and the frontline" Kenyan respondent.

Another participant described the benefits of getting a grassroots perspective as a hub member. They expressed a desire to convene hub meetings and invite the learning institution sponsoring the research, thereby taking ownership of the agenda and the process.

Respondents identified a number of networks: within the leadership hubs themselves, networks with the health facilities, then networks with our international team of researchers. They noted that such networking enhanced their knowledge and skills in implementing program activities. Some respondents felt that their networks started with their work places. In some situations the hubs when formed brought together pre-existing networks and linkages, from different districts, and different work places.

"I think it is very rich and it is open where everybody’s opinion is respected and the one is right to voice his or her opinion without being made to look like a fool or something like that" a South African respondent.

They shared ideas, experiences, activities and challenges and how to overcome them. During hub meetings, members appreciated having a national hub representative, and the registrar of nurses present when sharing across many countries. Meetings had been reinforced by newsletters produced quarterly. "We also shared our challenges and experiences with our national chair that is National Advisory Committee, and they were very supportive", a Kenyan nurse respondent.

Being a member of the hub provided opportunities for a number of members to attend national and international conferences. "We’ve been able to get a presentation to WHO and this was as a result of one of our visits that we made to the stakeholders at Ministry of Health, and that in essence has influenced effectiveness of policy changes within the healthcare system" a Jamaican manager.

"Having an opportunity to meet other Hub members from different parts of the world and then you present your work and it is criticized positively, I think that is an achievement" Kenyan nurse.

Among key issues discussed was how to sustain the network, by having partners who can support the work of hubs, through strengthening relationship with interested parties. As a result they had decided to lobby with nurse leaders at national level to have a research desk in the department of nursing, to regularize and sustain nursing research.

"And we have been able to share and to hear things that we were not aware of before. We have been able to meet with stakeholders and share ideas. We have been able to have training for some of our ancillary staff who are at the frontline in terms of infection control but had not been trained. And we have been able to link up with CHART [Caribbean HIV/AIDS Regional Training] to have them do our training for us". Kenyan respondent

Respondents reported that hub members decided on utilization of the research findings to improve services. They gave an example of a hub which decided to develop an awareness center, and gave feedback to the top decision makers.

"I want to say it was challenging but on the other hand also very educative" Kenyan respondent.

They also stressed the importance of involving top management. "If you are introducing something new, then you have to know that you have the different persons that you have to go through. So once you have passed it through your CEO, your Operations Managers and your Directors of Nursing Service and your Senior Medical Officers and have discussion with the relevant stakeholders. And they say ok go ahead and let us evaluate after you have implemented it" (Jamaican nurse).

This was done by most hubs, particularly those that were located in national capitals. When research results became available they also disseminated them to different persons within the hub and beyond. Respondents reported that hub members decided on utilization of the research findings to improve services. They gave an example of a hub, which decided to develop an awareness center, and gave feedback to the top decision makers.

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Respondents expressed their appreciation of the role of networking in strengthening their exchange of ideas and skills, as well as expanding their influence beyond their own institutions. They described better understanding the situation and more effectively lobbying for changes in policy and practice through their newly formed networks. They had benefitted from networking within and beyond their places of work, solving problems through networking.
“There are various activities but one of them has been conducting research at lower levels and involving the community and policy makers. It has also been interactive meetings between the hub members and those concerned and those who might be affected and getting the information from them and it has also been a question of sharing activities and information and through that way, information flow has been frequent and useful to those concerned”. A Kenyan participant spoke of how members of her leadership hub linked with the Chair of the National Advisory Committee and the Registrar of the Nursing Council.

“I got the chance to … interact with the topmost cadres and that is the commissioner of nurses and her deputy. We are on one table and I also interacted with some of the top hub members whom we would not have a chance to work with”. Similarly, a Ugandan respondent stated:

“We also shared our challenges and experiences with our national chair that is NAC [National Advisory Committee], and they were very supportive”.

The top management was willing to be involved in hub. “We can constantly get assistance and support whether it be for literature, I send requests to them and I find they are willing to put in their input” (Jamaican respondent).

The leadership hubs enhanced relationships within levels (horizontal) and across otherwise rigid barriers of professional, institutional and health systems structures (vertical connectivity), breaking down historical hierarchies and power relations, enabled by regular communication using multiple approaches. Hub members, mostly nurses, reported interacting with decision-makers in new ways as individuals as well as institutions.

“It has made me meet the Registrar of the nursing council which I have never done before, which is valuable because it means that nursing has been brought to another level because of the hub and I think things are moving on very well” (Kenyan nurse).

Leadership hub members spoke of generally working well with each other and across districts, sharing experience, expertise and information as well as encouraging one another. Hub networking complemented existing relationships:

“We have friends in different places and we have communication in whatever is happening in different facilities and organizations, so those friends are contributing ideas…” (Jamaican nurse).

“In terms of linkages and collaborations, I think we have had opportunities to share experiences with some of other Hubs within our provinces. We have been able to see how different Hubs work” (Jamaican nurse).

They reported having increased their sphere of influence. “I got the chance to be in the hub and I interacted with the top most cadres and that is the commissioner of nurses and her deputy we are on one table and I also interacted with some of the top hub members whom we would not [normally] have a chance to work with” (a Ugandan nurse).

Leadership hubs improved policy consciousness and therefore implementation.

“Now I can question any policy issues that are coming up and therefore we have to have implementation and formulation, [with] the knowledge that we have gained we realize that we have a role to play in policy implementation and formulation and that makes me interact more with policy makers” (Kenyan nurse).

g) Relationship, connectivity outcomes

The hub members expressed enthusiasm about bringing changes especially in the policies that were not conducive to nursing practice. Their objective was to improve nursing services through solidarity and connectivity. Together they felt able to improve workplace situations through lobbying that was informed by research and backed up by hub-linked networks. The community representatives in the hub gave the community members feedback and information on what was expected of them. This strengthened solidarity:

“I saw a lot of people sharing and acknowledging each others’ strengths. I saw leadership just coming up each time this person is presenting on behalf of the group. So in my view their relationship really improved, and they were able to identify leadership qualities that are in different persons so they were able to utilize the person in a different way” (Kenyan nurse).

Respondents appreciated the opportunity to share with Leadership Hub members from other countries. They shared ideas, experiences, activities and challenges and how to overcome them:

“Sharing is very rich. It makes us exposed and makes us even encouraged to grow to other areas [involving people other than nurses]… it needs the team work for us to pass the seeds to many [other] states. We need a lot of team work, so we need other people to bring us the resources and the administrators to implement what we have planned” (South African nurse).

“Especially being the leader of the hub I have been supported to network with the internationally sponsored teams” (Ugandan administrator).

“We were able to express ourselves to show them what we have been doing here so it was a wow for me; it even motivated us”. {Ugandan community representative}

The respondents expressed a strong view that connectivity enabled them to face challenges. The hubs strengthened evidence-based decision making, including policy making. The international dimension of connectivity enhanced credibility of the leadership hubs in the health system.
Connectivity contributed to our hub because somewhere we could be stuck, we do not know how to go on, then you call another hub and ask them how they have tackled this problem then they tell you how they have managed and that can give you an encouragement” a Ugandan respondent.

h) Unique vantage positioning for participation in policy processes pathway

Many respondents felt that the leadership hubs enabled nurses to bring their unique vantage point as a contribution to policy. They contributed relevant information based on their experience with daily health system realities. Their perspectives helped improve health services and policies, through informed choices and decisions. Leadership hubs provided vantage positioning leveraging access and contribution of frontline nurses, or nurses at various levels to decision making fora and structures, supported by evidence and workplace realities, to improve policy relevance, quality, uptake and implementation. Nurses described highlighting issues specific to the workplace context and the realities of policy dissemination and implementation that negatively impacted care if left unconsidered. A South African nurse gave an example of contradictory policies, which simultaneously promoted provider-initiated HIV testing, and voluntary counselling and testing (VCT).

“There is this policy, they are calling it the ‘provider initiative’, whereby a nurse first tests then counselling comes later. Yet VCT still lingers, and makes patients refuse testing because policies are just clashing with each other” (South African nurse).

Respondents described various enablers for change that were triggered by the enhanced horizontal and vertical connections they experienced through the hubs. They better understood the chain of policy influence and how to position themselves, not only as hub members, but also in their working situations.

“Being part of the leadership hub has afforded me the opportunity to be policy conscious. When I am interacting with frontline nurses, middle level or senior managers, [they are] always asking if there is a policy guiding whatever we are engaged in and whether we are guided by it” (Jamaican nurse).

They described a deeper awareness of both opportunities and challenges for nurses’ engagement in policy change processes. Nurses emphasized the need for bottom-up approaches to policy processes

“Well, I would say that we are used to policy coming from up [National level] to here [District level]. But since I joined the hub, I have learnt that policy can be developed at a lower level. They can be developed in such a way that whatever you have on the ground or if you have challenges or inputs; we can still table those inputs and challenges right back from the working area back to the national level” (Kenyan nurse).

Legitimacy and credibility of the hubs and their policy role was established through connections with the National Advisory Committees. As the work of the hubs progressed, this legitimacy was reinforced by various actors. This in turn shaped hub members’ perceptions of having and being part of an extended network and accompanying spheres of influence. Respondents observed that some of the policies were unrealistic in local contexts, besides different contexts may require different policies, in which front-liners and managers were involved, since health issues and geographical considerations were different. They pointed out that the chief nursing officer and her/his deputies were always at the policy meetings. Yet what emerged as policy was often not comprehensible to frontline nurses. Linkage to frontline nurses would facilitate formulation, dissemination and implementation of relevant policies because of shared ownership. The respondents noted that implementing improved policies would help to strengthen the entire nursing interventions. Research would inform this process, making policies evidence-and experience-based. Hubs would be well placed to guide research, to ensure relevance and validity of findings, within contexts.

“We have friends in different places and we have communication in whatever is happening in different facilities and organizations, so those friends are contributing, ideas on what we ask them they just contribute”. South African respondent.

Relevance was reinforced by opportunities to not only learn how to develop policies but also to effect them. They noted that their hub involvement was very beneficial to their institutions. There were possible ripple effects on colleagues at the workplace. “In terms of linkages and collaborations, I think we have had opportunity to share experiences with some of other Hubs within our provinces that we have been able to share and see how different Hubs work” (a Jamaican Nurse).

Nurses spoke about the disconnect they saw between their central role in providing care and their distance from policy decision-making structures that had a direct impact on the provision of quality care and a healthy workplace environment. They spoke about being relied on only as implementers of health policies, with little role in the policy development or decision-making processes.

“They should consult us even if it comes from above, since we are the ones to implement, while they are sitting there and doing nothing for us” (South African nurse).

The entrenched top-down approach in the health professions was raised by some leadership hub members as a hindrance to their contribution to policy
development: Historical legacies of strong hierarchical power structures within the nursing profession and between healthcare professions (especially between physicians and nurses) were raised as a challenge to nurses being able to contribute to policy discussions. Respondents spoke of the expectation by decision makers and physicians that nurses’ role in the clinical environment was to follow orders rather than to question or contribute. They emphasized the need to identify and confront the historical disconnect between nursing roles and their participation in policy making, rigid hierarchical professional structures, entrenched top-down approaches within and beyond nursing structures fueled by gender and power relations, nursing education and socialization. Many respondents mentioned persistent resistance to change among nurse managers, based on the rigid organizational structures of the health system.

"Policy makers on top do not listen to us down here because we are little people so getting them to change their ways, it’s going to be a hard task. It’s going to be a challenge at first for them to really listen because they are accustomed to doing the policy themselves" (Jamaican nurse).

Respondents spoke of how the leadership hub structure provided a neutral ground for stakeholder collaboration without the constraints of formal system interactions:

"Hub has brought a neutral ground whereby we are not seeing each other as, in terms of levels or categories, we are seeing each other as members, as a team, as a family who have a common thing to share, so the fear, the feeling of fears guilt that maybe I am going to be brought down [are minimized]. Because initially we knew each other as District Public Health Nurse (DPHN), as the Nursing Officer in-Charge, the Public Health Officer (PHO) at the health facility level, but now it has brought us to accept each other as human beings as well" (Kenyan respondent).

Additionally, participants described persisting socio-cultural and gender power relations that influenced the participation of nurses, in their experience, in the processes of policy review and formulation:

"In old times, the nature of our training as nurses, we were supposed to be submissive. We are not supposed to challenge doctors. It is not easy for a nurse to tell the doctor that ‘you have gone to represent us many times why don’t we take a nurse this time, given that nurses tended to be women and doctors to be men’" a Kenyan nurse.

This was further complicated by scheduling of work, as people work in shifts. From the beginning hub members anticipated lack of time to be a major challenge that would affect their participation.

"It might be daunting because of time management and constraints in terms of what we have to do in our substantive positions, because persons at that policy level tend to think that their time is so valuable, and that they really have got the answers already", Jamaican respondent.

Respondents described lack of vertical feedback loops which meant that while nurses experienced first-hand the impact of workplace safety and quality of care due to results of gaps in policy or inadequate dissemination or implementation, there were no mechanisms to channel their frontline evidence:

"there is no upwards feedback from the nurse going up and changes are made. So there has to be a change in such a manner that a nurse can post his or her contribution towards policy formulation and policy change" (Kenyan nurse).

They noted that many policies did not take into account the different professional categories in the health sector. This affects policy implementation by health facilities. Different professional categories may require different levels of implementation training.

"if you have not participated in the policy formulation, you only receive and follow and you end up failing because of inadequate understanding of it" (Ugandan nurse).

Respondents noted that the differences in levels of formal educational attainment between healthcare professions played a role in who might be considered able to contribute to policy discussions:

"… usually when you bring a policy you want someone who’s an expert in that particular area, but most of our nurses have been having diplomas, diplomas, diplomas. They have a rich experience, but…in terms of expertise, it’s a little bit different, so I don’t think much has changed because of the education status of the nurses we have in the country" (Ugandan nurse).

Additionally, the impact of the nursing shortage and limited resources on clinical environment were both identified as constraints to participating in policy-related activities. This was magnified by the limited personnel and material resources at workplaces, making workload unmanageable:

"Some of us don’t have the time because of the pressing work that we do" (Jamaican respondent).

Respondents felt that responsibilities for research and policy could be built into the functions of the nurses’ administrators. They felt that all nurse managers at every level should highlight research and policy among their tasks. Some hubs lobbied for space to operate, by demonstrating positive benefits of working in leadership hubs.
"When I come to meetings I actually represent the nursing council and in those meetings have always said the importance of research to the nursing council. Nursing Council [at] this time is out to support nursing research so during our meetings we have been given very good comments, which have made the hub members change the design or change somehow so that it's logical it looks like it is vivid" (Kenyan nurse).

III. DISCUSSION

In recent years, there has been increased recognition of the need for greater involvement of nurses in policy and decision making (Kunaviktikul 2014; Richter et al., 2013) as a necessary ingredient for improving client care and strengthening health services provision. Numerous World Health Assembly resolutions (WHA 49.1 and WHA 54.12), the International Council of Nurses, the Pan-American Health Organization, have strongly recommended greater input by nurses. Three pathways for leveraging change emerged from the leadership hub experiment. These are congruent with the hub model of horizontal and vertical interconnections described by Edwards et al (2016), to enhance their participation in research and policy making.

a) Learning mechanisms and outcomes

Interconnections provided effective learning mechanisms, which resulted in increased policy consciousness, and stronger ability to engage. Learning was augmented by bringing hub participants from different levels of the health system to learn together. Leadership hubs established interconnections that promoted mutual, experiential, peer learning, which proved to be efficient, effective and sustainable based on shared experiences, values and solidarity driven by multilevel, multi-context relationships. This influenced workplace policies, performance, motivation which reduced burnout sustaining excellence in service delivery. This view is supported by the work of Alimo-Metcalfe (2012). Team building enhanced learning in various levels of linkages. In return, members of the hub felt confident and empowered in research and policy development. Barzegar et al. (2020) emphasized the importance of enhancing the policy awareness among nurses.

Deliberately structured hubs with vertical and horizontal dimensions became an engine or leverage for transformational change in the health system. Alimo-Metcalfe (2012) further says that quality improvement requires engaging leadership behaviours in the way they work together, involving a variety of actors in a relationship; with regular communication to all participating stakeholders, taking joint action as needed. According to John Benington and Jean Hartley (2009) success in driving both quality and efficiency improvement, demands new levels of co-operation and partnership-working across systems, notably between hospital and community services and between health and social care. Leadership hubs in this study, promoting ‘adaptive leadership’ to tackle tough, complex, cross-cutting problems as described by (Heifetz and Linsky 2009).

Connectivity generated learning mechanisms, created safe environments, provided neutral grounds for learning more about research and policy generation, and created a profound policy consciousness about how to influence decision-making processes. Mutual experiential learning among hub members motivated them to take advantage of opportunities for accelerated professional growth and development. Realization of their own potential to contribute to policy processes with newly acquired skills led to empowerment, and increased confidence, recognition, respect, improved participation in joint policy undertaking, building support from key players. These findings are congruent with those of Innes and Booher (1999). Studies by (Emslie 2007; Storey et al 2010) indicate that systems whose decision-making structures engage staff from various levels in decision-making raise satisfaction and hence performance. Thus leadership hubs through connectivity improved self image among participants and hence increased their engagement and performance.

b) Relationships, networking and their outcomes

The hub model developed inter and co-dependent connections (horizontal and vertical), which led to solidarity and legitimacy as policy actors and influencers. Findings highlight the importance of bringing together and integrating varying perspectives within and across levels of the health system to improve research, policy influence and practice as observed by David Welbourn and colleagues (2012). It enhanced nurses’ voices in policy making, as they were consulted more. They learnt problem solving skills, and enhanced inter-dependency on other levels and professions. Stimulating team work among colleagues, stimulated support from senior staff, encouraged communication within the work environment, and provided members with skills and knowledge shared through leadership hubs. The various linkages were a great motivation for nurses in their work places. These findings are supported by Barzegar and colleagues who observed that increasing partnerships with nurses at the upper levels of health services management encourages participation in policy processes and development (Barzegar et al. 2020).

Factors influencing connectivity included hub composition and profile of hubs. This is consistent with the findings of Goodrich and Levenson (2012) who found that bringing together staff from various disciplines to meet once a month to reflect on the non-clinical aspects of their work, discuss difficult emotional and social issues arising out of patient care day-to-day
improves motivation and workplace performance. In our model the hub process appeared to confront participants with gaps in their practice, which were unacceptable. They had no option but to take steps to address the gaps. This phenomenon has been described by Yvo and Nuens (2007). This enhanced their authority, autonomy, and sustainable engagement. Bringing together and integrating varying perspectives within and across levels of health system improves policy influence and practice, also noted by David Wellbourn and colleagues (2012). Nurses’ contributions to the policy process facilitated better formulation, dissemination and implementation because of shared ownership and relevance, given the information and evidence from nursing practices to help them realize cost-effective and high quality health care as observed by Vonderheid et al. (2001). It is therefore necessary that nursing expertise is fully integrated into all levels of the relevant decision-making processes.

c) Vantage positioning and outcomes

The study established that the leadership hubs enabled nurses to bring their unique perspectives to contribute informed policy outcomes, relevant to the frontline contexts of service delivery. Many researchers suggest that that technical knowledge and experience of nurses is often excluded from policy decisions (Walker & Gilson, 2004; Juma et al, 2014; Richter et al., 2013). Nurses, as linchpins in service provision tend to be absent from policy development. From this study the leadership hub model appears effective in enhancing the quality of policy making processes by including nursing experiences from the frontlines as advocated by (ICN 2008).

The findings suggest that connections with the National Advisory Committees enabled the legitimacy and credibility of the hubs and their policy role. This, in turn, shaped hub members’ perceptions of having and being part of an extended network and the accompanying spheres of influence as described by (Bryston et al., 2013). Our findings suggest that Leadership hubs were able to bring together nurses at the same level (horizontal connectivity) and across different levels (vertical connectivity) of the health systems to address building blocks described by WHO (WHO 2008, WHO 2010c, WHO, 2013a), thus enhancing their vantage positioning for engagement at different levels.

The findings highlighted the disconnect between their central role of nurses in service provision and their exclusion from policy decision-making that had a direct impact on the quality of care and workplace environment. This brings out the urgent need to systematically bring in the technical knowledge and experience of nurses to inform policy decisions as described by (Richter et al., 2013) being key stakeholders in the provision of quality care. The study underscored the effectiveness of leadership hubs to address the entrenched top-down approach in the health professions built on the historical legacies hierarchical power structures within the healthcare professions that has limited their contribution to policy processes. A mechanism described by (McGuire, 2006; Bryston et al, 2013).

Another obstacle to nurses participation in policy processes addressed by the leadership hubs was the persisting socio-cultural and gender power relations described by (Asuquo et al 2013; Juma et al., 2014; WHO, 2006) who assert that nurses tend to have limited meaningful engagement with other professionals and with political and policy actors. According to our findings the hubs also addressed the lack of vertical feedback loops, denying the health system the first-hand information from the experience of nurses to improve policy review dissemination and implementation, as they form the backbone of health care systems around the globe, and their contribution is recognized as essential to delivering safe and effective health care, (Martínez & Martineau 1998, Dovlo 2007) and improve health systems performance Virginia Gunn et al (2018).

IV. Conclusion

This analysis indicates that our hub empowerment model improved nurses’ knowledge, skills, influence and participation in decision making processes at workplace and health system. The study demonstrated the benefits of horizontal and vertical connectivity, in leveraging change through evidence-based engagement, identified and described. Clear pathways by which the model works emerged. These pathways should be examined in future research in other settings.

Encouraging a leadership model that seeks to distribute influence and decision-making throughout the structures is essential to accelerate achievement of health related SDGs, healthy lives and wellbeing by all, leaving no one behind. Leadership needs to be developed in ways that break down rather than reinforce silos, with managers and clinicians training and working together. The hub models enhanced growth in their career towards greater autonomy in decision making through inter-connectivity within and across levels of authority and power in the health system. The study has shown that quality and efficiency improvement demands new levels of co-operation and partnership-working across systems, as promoted by hubs promoting ‘adaptive leadership’ to tackle tough, complex, cross-cutting problems.

V. Recommendation

“Ties that bind” were created by establishing formal communication channels through technology and informal channels through face-to-face interaction,
coordinating activities across organizations. Nursing, Medical and the Health Professional associations could apply the hub model to enhance nursing participation and influence to accelerate achievement of universal health care, by engaging networks and structures of nursing, other health professionals and the health sector for transformation. These changes could be sustained by integrating the hub model into existing structures in health and professional systems.

**Declarations**

**Ethics approval and consent to participate**

Ethics approval was obtained from 15 research ethics boards in Canada and all study countries. The study protocols were reviewed and approved by relevant institutional ethics review boards in the Canada, University of Ottawa and 14 other research ethics boards in Canada and study countries. Great Lakes University of Kisumu Ethical Review Board approved the study in Kenya. The national research clearance certificate and permit was obtained from National Commission for Science, Technology and Innovation (NACOSTI). Letters of permission were obtained from all health institutions involved in the study.

**Informed Consent Statement:** All participants provided written informed consent to participate in the study.

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Consent for publication: All authors read and approved the final manuscript.

**Availability of data and materials:** The datasets used and/or analysed during the current study are available from the Corresponding author on reasonable request.

**Competing interests:** The authors declare no conflict of interest.

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**Conflicts of Interest:** The authors declare no conflict of interest.

**Authors Contribution**

**DCOK and NE:** Designed the study, managed the research process, supervised all aspects of the study and the team members, participated in the analysis of data, development of the analysis framework, and synthesized the contributions from other authors into the manuscript. They both supervised the writing of the paper and the writing team.

**BMO:** Contributed into drafting the manuscript and synthesized the contributions of the other authors into the first draft of the manuscript. She further engaged actively in the revision of the manuscript in response to critiques from co-authors and took the lead in editing the manuscript based on internal peer reviewers’ comments.

**EK:** Reviewed and contributed to the editing of the final manuscript draft and made suggestions and inputs towards the final draft.

All authors have read and approved the manuscript.

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Table 1: Emerging connectivity policy change pathways

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<td>Built knowledge, skills, trust, Policy, awareness consciousness / cycle/ influence, Professional growth, Empowerment, realized own potential</td>
<td>Increased confidence, professional recognition, respect, improved performance, influence and participation</td>
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<tr>
<td>Connectivity relationship and networking that developed inter and co-dependent connections (horizontal and vertical) to act jointly/as a collective Multi-stakeholder composition Multi-level interactions linkages, Intra and Inter-country communication face to face, electronic and newsletter New relationships, collaboration, representation, enhance relationships at work place, Teams with common objectives, sharing results</td>
<td>Built solidarity, gained legitimacy as policy actors, influencers Bottom up information valued, Appreciation of roles in policy, Sharing challenges and solutions, Integration of perspectives, appreciation of diversity Participation Access to resources Access to research findings, Evidence empowered, critiqued each other, improved relations within and between levels, sustainability</td>
<td>Performance improvement Increased professional recognition and mutual respect, Enhanced voice in policy making, influence, authority, consulted, better at problem solving, reduced dependency on other levels and professions, stigma and discrimination reduced Policies, more relevant to context, better understood, disseminated and implemented</td>
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</table>
At tending conferences, meetings with peers and mentors, institutionalization

3. Connectivity vantage positioning for participation in policy processes, supporting boundary spanning engagement beyond historical social, gender, and professional hierarchical power relations

Institutional benefits, support to Hub members, Dissemination of findings, rights, Vertical feedback loops & channels, Addressing historical disconnect between nursing and policy making roles. Break down of Rigid entrenched top down hierarchical policy & professional, structures, Opportunity; Address differential educational qualification, workload

Expanded sphere of influence, credibility, Enhanced confidence Value, relevance of ideas from bottom, better lobbying, Shared ownership, Use of research findings Broken down hierarchies, contextualization of research and policy Provided feedback loops for continuous improvement Social capital, Solidarity, better scheduling work, ability to confront historical legacies

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<td>Chief Nurse. Policy Manager, HIV Coordinator (3) Nursing tutor, DPHN, Provincial Nursing Officer, Registrar (2), Nursing Council, MOH Manager HIV, Director of Social service, HIV, Public Service HIV coordinator</td>
<td>President, Nursing association ii, Chairman NNA, DENOSA</td>
<td>Senior Medical Officer, Assistant Commissioner of nursing, Public Health Nurse</td>
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<tr>
<td>Hub</td>
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<td>DENOSA</td>
<td>Senior Nurse Officer, Head Nurse (2), HR officer, HIV coordinator, frontline nurse</td>
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<td>Provincial nurse supervisor, Provincial Nurse, Assistant Commissioner of Health Services,</td>
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Acknowledgments

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The following is the official style and template developed for publication of a research paper. Authors are not required to follow this style during the submission of the paper. It is just for reference purposes.
Manuscript Style Instruction (Optional)

- Microsoft Word Document Setting Instructions.
- Font type of all text should be Swis721 Lt BT.
- Page size: 8.27” x 11”", left margin: 0.65, right margin: 0.65, bottom margin: 0.75.
- Paper title should be in one column of font size 24.
- Author name in font size of 11 in one column.
- Abstract: font size 9 with the word “Abstract” in bold italics.
- Main text: font size 10 with two justified columns.
- Two columns with equal column width of 3.38 and spacing of 0.2.
- First character must be three lines drop-capped.
- The paragraph before spacing of 1 pt and after of 0 pt.
- Line spacing of 1 pt.
- Large images must be in one column.
- The names of first main headings (Heading 1) must be in Roman font, capital letters, and font size of 10.
- The names of second main headings (Heading 2) must not include numbers and must be in italics with a font size of 10.

Structure and Format of Manuscript

The recommended size of an original research paper is under 15,000 words and review papers under 7,000 words. Research articles should be less than 10,000 words. Research papers are usually longer than review papers. Review papers are reports of significant research (typically less than 7,000 words, including tables, figures, and references)

A research paper must include:

a) A title which should be relevant to the theme of the paper.
b) A summary, known as an abstract (less than 150 words), containing the major results and conclusions.
c) Up to 10 keywords that precisely identify the paper’s subject, purpose, and focus.
d) An introduction, giving fundamental background objectives.
e) Resources and techniques with sufficient complete experimental details (wherever possible by reference) to permit repetition, sources of information must be given, and numerical methods must be specified by reference.
f) Results which should be presented concisely by well-designed tables and figures.
g) Suitable statistical data should also be given.
h) All data must have been gathered with attention to numerical detail in the planning stage.

Design has been recognized to be essential to experiments for a considerable time, and the editor has decided that any paper that appears not to have adequate numerical treatments of the data will be returned unrefereed.

i) Discussion should cover implications and consequences and not just recapitulate the results; conclusions should also be summarized.
j) There should be brief acknowledgments.
k) There ought to be references in the conventional format. Global Journals recommends APA format.

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*It is necessary that authors take care in submitting a manuscript that is written in simple language and adheres to published guidelines.*

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The title page must carry an informative title that reflects the content, a running title (less than 45 characters together with spaces), names of the authors and co-authors, and the place(s) where the work was carried out.

**Author details**

The full postal address of any related author(s) must be specified.

**Abstract**

The abstract is the foundation of the research paper. It should be clear and concise and must contain the objective of the paper and inferences drawn. It is advised to not include big mathematical equations or complicated jargon.

Many researchers searching for information online will use search engines such as Google, Yahoo or others. By optimizing your paper for search engines, you will amplify the chance of someone finding it. In turn, this will make it more likely to be viewed and cited in further works. Global Journals has compiled these guidelines to facilitate you to maximize the web-friendliness of the most public part of your paper.

**Keywords**

A major lynchpin of research work for the writing of research papers is the keyword search, which one will employ to find both library and internet resources. Up to eleven keywords or very brief phrases have to be given to help data retrieval, mining, and indexing.

One must be persistent and creative in using keywords. An effective keyword search requires a strategy: planning of a list of possible keywords and phrases to try.

Choice of the main keywords is the first tool of writing a research paper. Research paper writing is an art. Keyword search should be as strategic as possible.

One should start brainstorming lists of potential keywords before even beginning searching. Think about the most important concepts related to research work. Ask, "What words would a source have to include to be truly valuable in a research paper?" Then consider synonyms for the important words.

It may take the discovery of only one important paper to steer in the right keyword direction because, in most databases, the keywords under which a research paper is abstracted are listed with the paper.

**Numerical Methods**

Numerical methods used should be transparent and, where appropriate, supported by references.

**Abbreviations**

Authors must list all the abbreviations used in the paper at the end of the paper or in a separate table before using them.

**Formulas and equations**

Authors are advised to submit any mathematical equation using either MathJax, KaTeX, or LaTeX, or in a very high-quality image.

**Tables, Figures, and Figure Legends**

Tables: Tables should be cautiously designed, uncrowned, and include only essential data. Each must have an Arabic number, e.g., Table 4, a self-explanatory caption, and be on a separate sheet. Authors must submit tables in an editable format and not as images. References to these tables (if any) must be mentioned accurately.
Figures

Figures are supposed to be submitted as separate files. Always include a citation in the text for each figure using Arabic numbers, e.g., Fig. 4. Artwork must be submitted online in vector electronic form or by emailing it.

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Although low-quality images are sufficient for review purposes, print publication requires high-quality images to prevent the final product being blurred or fuzzy. Submit (possibly by e-mail) EPS (line art) or TIFF (halftone/photos) files only. MS PowerPoint and Word Graphics are unsuitable for printed pictures. Avoid using pixel-oriented software. Scans (TIFF only) should have a resolution of at least 350 dpi (halftone) or 700 to 1100 dpi (line drawings). Please give the data for figures in black and white or submit a Color Work Agreement form. EPS files must be saved with fonts embedded (and with a TIFF preview, if possible).

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Tips for Writing a Good Quality Medical Research Paper

1. Choosing the topic: In most cases, the topic is selected by the interests of the author, but it can also be suggested by the guides. You can have several topics, and then judge which you are most comfortable with. This may be done by asking several questions of yourself, like "Will I be able to carry out a search in this area? Will I find all necessary resources to accomplish the search? Will I be able to find all information in this field area?" If the answer to this type of question is "yes," then you ought to choose that topic. In most cases, you may have to conduct surveys and visit several places. Also, you might have to do a lot of work to find all the rises and falls of the various data on that subject. Sometimes, detailed information plays a vital role, instead of short information. Evaluators are human: The first thing to remember is that evaluators are also human beings. They are not only meant for rejecting a paper. They are here to evaluate your paper. So present your best aspect.

2. Think like evaluators: If you are in confusion or getting demotivated because your paper may not be accepted by the evaluators, then think, and try to evaluate your paper like an evaluator. Try to understand what an evaluator wants in your research paper, and you will automatically have your answer. Make blueprints of paper: The outline is the plan or framework that will help you to arrange your thoughts. It will make your paper logical. But remember that all points of your outline must be related to the topic you have chosen.

3. Ask your guides: If you are having any difficulty with your research, then do not hesitate to share your difficulty with your guide (if you have one). They will surely help you out and resolve your doubts. If you can't clarify what exactly you require for your work, then ask your supervisor to help you with an alternative. He or she might also provide you with a list of essential readings.

4. Use of computer is recommended: As you are doing research in the field of medical research then this point is quite obvious. Use right software: Always use good quality software packages. If you are not capable of judging good software, then you can lose the quality of your paper unknowingly. There are various programs available to help you which you can get through the internet.

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6. **Bookmarks are useful**: When you read any book or magazine, you generally use bookmarks, right? It is a good habit which helps to not lose your continuity. You should always use bookmarks while searching on the internet also, which will make your search easier.

7. **Revise what you wrote**: When you write anything, always read it, summarize it, and then finalize it.

8. **Make every effort**: Make every effort to mention what you are going to write in your paper. That means always have a good start. Try to mention everything in the introduction—what is the need for a particular research paper. Polish your work with good writing skills and always give an evaluator what he wants. Make backups: When you are going to do any important thing like making a research paper, you should always have backup copies of it either on your computer or on paper. This protects you from losing any portion of your important data.

9. **Produce good diagrams of your own**: Always try to include good charts or diagrams in your paper to improve quality. Using several unnecessary diagrams will degrade the quality of your paper by creating a hodgepodge. So always try to include diagrams which were made by you to improve the readability of your paper. Use of direct quotes: When you do research relevant to literature, history, or current affairs, then use of quotes becomes essential, but if the study is relevant to science, use of quotes is not preferable.

10. **Use proper verb tense**: Use proper verb tenses in your paper. Use past tense to present those events that have happened. Use present tense to indicate events that are going on. Use future tense to indicate events that will happen in the future. Use of wrong tenses will confuse the evaluator. Avoid sentences that are incomplete.

11. **Pick a good study spot**: Always try to pick a spot for your research which is quiet. Not every spot is good for studying.

12. **Know what you know**: Always try to know what you know by making objectives, otherwise you will be confused and unable to achieve your target.

13. **Use good grammar**: Always use good grammar and words that will have a positive impact on the evaluator; use of good vocabulary does not mean using tough words which the evaluator has to find in a dictionary. Do not fragment sentences. Eliminate one-word sentences. Do not ever use a big word when a smaller one would suffice.

Verbs have to be in agreement with their subjects. In a research paper, do not start sentences with conjunctions or finish them with prepositions. When writing formally, it is advisable to never split an infinitive because someone will (wrongly) complain. Avoid clichés like a disease. Always shun irritating alliteration. Use language which is simple and straightforward. Put together a neat summary.

14. **Arrangement of information**: Each section of the main body should start with an opening sentence, and there should be a changeover at the end of the section. Give only valid and powerful arguments for your topic. You may also maintain your arguments with records.

15. **Never start at the last minute**: Always allow enough time for research work. Leaving everything to the last minute will degrade your paper and spoil your work.

16. **Multitasking in research is not good**: Doing several things at the same time is a bad habit in the case of research activity. Research is an area where everything has a particular time slot. Divide your research work into parts, and do a particular part in a particular time slot.

17. **Never copy others’ work**: Never copy others’ work and give it your name because if the evaluator has seen it anywhere, you will be in trouble. Take proper rest and food: No matter how many hours you spend on your research activity, if you are not taking care of your health, then all your efforts will have been in vain. For quality research, take proper rest and food.

18. **Go to seminars**: Attend seminars if the topic is relevant to your research area. Utilize all your resources.

19. **Refresh your mind after intervals**: Try to give your mind a rest by listening to soft music or sleeping in intervals. This will also improve your memory. Acquire colleagues: Always try to acquire colleagues. No matter how sharp you are, if you acquire colleagues, they can give you ideas which will be helpful to your research.
20. **Think technically:** Always think technically. If anything happens, search for its reasons, benefits, and demerits. Think and then print: When you go to print your paper, check that tables are not split, headings are not detached from their descriptions, and page sequence is maintained.

21. **Adding unnecessary information:** Do not add unnecessary information like "I have used MS Excel to draw graphs." Irrelevant and inappropriate material is superfluous. Foreign terminology and phrases are not apropos. One should never take a broad view. Analogy is like feathers on a snake. Use words properly, regardless of how others use them. Remove quotations. Puns are for kids, not grunt readers. Never oversimplify: When adding material to your research paper, never go for oversimplification; this will definitely irritate the evaluator. Be specific. Never use rhythmic redundancies. Contractions shouldn’t be used in a research paper. Comparisons are as terrible as clichés. Give up ampersands, abbreviations, and so on. Remove commas that are not necessary. Parenthetical words should be between brackets or commas. Understatement is always the best way to put forward earth-shaking thoughts. Give a detailed literary review.

22. **Report concluded results:** Use concluded results. From raw data, filter the results, and then conclude your studies based on measurements and observations taken. An appropriate number of decimal places should be used. Parenthetical remarks are prohibited here. Proofread carefully at the final stage. At the end, give an outline to your arguments. Spot perspectives of further study of the subject. Justify your conclusion at the bottom sufficiently, which will probably include examples.

23. **Upon conclusion:** Once you have concluded your research, the next most important step is to present your findings. Presentation is extremely important as it is the definite medium though which your research is going to be in print for the rest of the crowd. Care should be taken to categorize your thoughts well and present them in a logical and neat manner. A good quality research paper format is essential because it serves to highlight your research paper and bring to light all necessary aspects of your research.

**Informal Guidelines of Research Paper Writing**

**Key points to remember:**

- Submit all work in its final form.
- Write your paper in the form which is presented in the guidelines using the template.
- Please note the criteria peer reviewers will use for grading the final paper.

**Final points:**

One purpose of organizing a research paper is to let people interpret your efforts selectively. The journal requires the following sections, submitted in the order listed, with each section starting on a new page:

*The introduction:* This will be compiled from reference matter and reflect the design processes or outline of basis that directed you to make a study. As you carry out the process of study, the method and process section will be constructed like that. The results segment will show related statistics in nearly sequential order and direct reviewers to similar intellectual paths throughout the data that you gathered to carry out your study.

*The discussion section:* This will provide understanding of the data and projections as to the implications of the results. The use of good quality references throughout the paper will give the effort trustworthiness by representing an alertness to prior workings.

Writing a research paper is not an easy job, no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record-keeping are the only means to make straightforward progression.

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Mistakes to avoid:

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- Submitting a manuscript with pages out of sequence.
- In every section of your document, use standard writing style, including articles ("a" and "the").
- Keep paying attention to the topic of the paper.
- Use paragraphs to split each significant point (excluding the abstract).
- Align the primary line of each section.
- Present your points in sound order.
- Use present tense to report well-accepted matters.
- Use past tense to describe specific results.
- Do not use familiar wording; don't address the reviewer directly. Don't use slang or superlatives.
- Avoid use of extra pictures—include only those figures essential to presenting results.

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Choose a revealing title. It should be short and include the name(s) and address(es) of all authors. It should not have acronyms or abbreviations or exceed two printed lines.

Abstract:

This summary should be two hundred words or less. It should clearly and briefly explain the key findings reported in the manuscript and must have precise statistics. It should not have acronyms or abbreviations. It should be logical in itself. Do not cite references at this point.

An abstract is a brief, distinct paragraph summary of finished work or work in development. In a minute or less, a reviewer can be taught the foundation behind the study, common approaches to the problem, relevant results, and significant conclusions or new questions.

Write your summary when your paper is completed because how can you write the summary of anything which is not yet written? Wealth of terminology is very essential in abstract. Use comprehensive sentences, and do not sacrifice readability for brevity; you can maintain it succinctly by phrasing sentences so that they provide more than a lone rationale. The author can at this moment go straight to shortening the outcome. Sum up the study with the subsequent elements in any summary. Try to limit the initial two items to no more than one line each.

Reason for writing the article—theory, overall issue, purpose.

- Fundamental goal.
- To-the-point depiction of the research.
- Consequences, including definite statistics—if the consequences are quantitative in nature, account for this; results of any numerical analysis should be reported. Significant conclusions or questions that emerge from the research.

Approach:

- Single section and succinct.
- An outline of the job done is always written in past tense.
- Concentrate on shortening results—limit background information to a verdict or two.
- Exact spelling, clarity of sentences and phrases, and appropriate reporting of quantities (proper units, important statistics) are just as significant in an abstract as they are anywhere else.

Introduction:

The introduction should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable of comprehending and calculating the purpose of your study without having to refer to other works. The basis for the study should be offered. Give the most important references, but avoid making a comprehensive appraisal of the topic. Describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will give no attention to your results. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here.

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XVII
The following approach can create a valuable beginning:

- Explain the value (significance) of the study.
- Defend the model—why did you employ this particular system or method? What is its compensation? Remark upon its appropriateness from an abstract point of view as well as pointing out sensible reasons for using it.
- Present a justification. State your particular theory(-ies) or aim(s), and describe the logic that led you to choose them.
- Briefly explain the study's tentative purpose and how it meets the declared objectives.

Approach:

Use past tense except for when referring to recognized facts. After all, the manuscript will be submitted after the entire job is done. Sort out your thoughts; manufacture one key point for every section. If you make the four points listed above, you will need at least four paragraphs. Present surrounding information only when it is necessary to support a situation. The reviewer does not desire to read everything you know about a topic. Shape the theory specifically—do not take a broad view.

As always, give awareness to spelling, simplicity, and correctness of sentences and phrases.

Procedures (methods and materials):

This part is supposed to be the easiest to carve if you have good skills. A soundly written procedures segment allows a capable scientist to replicate your results. Present precise information about your supplies. The suppliers and clarity of reagents can be helpful bits of information. Present methods in sequential order, but linked methodologies can be grouped as a segment. Be concise when relating the protocols. Attempt to give the least amount of information that would permit another capable scientist to replicate your outcome, but be cautious that vital information is integrated. The use of subheadings is suggested and ought to be synchronized with the results section.

When a technique is used that has been well-described in another section, mention the specific item describing the way, but draw the basic principle while stating the situation. The purpose is to show all particular resources and broad procedures so that another person may use some or all of the methods in one more study or referee the scientific value of your work. It is not to be a step-by-step report of the whole thing you did, nor is a methods section a set of orders.

Materials:

*Materials may be reported in part of a section or else they may be recognized along with your measures.*

Methods:

- Report the method and not the particulars of each process that engaged the same methodology.
- Describe the method entirely.
- To be succinct, present methods under headings dedicated to specific dealings or groups of measures.
- Simplify—detail how procedures were completed, not how they were performed on a particular day.
- If well-known procedures were used, account for the procedure by name, possibly with a reference, and that’s all.

Approach:

It is embarrassing to use vigorous voice when documenting methods without using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result, when writing up the methods, most authors use third person passive voice.

Use standard style in this and every other part of the paper—avoid familiar lists, and use full sentences.

What to keep away from:

- Resources and methods are not a set of information.
- Skip all descriptive information and surroundings—save it for the argument.
- Leave out information that is immaterial to a third party.
Results:
The principle of a results segment is to present and demonstrate your conclusion. Create this part as entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Use statistics and tables, if suitable, to present consequences most efficiently.

You must clearly differentiate material which would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matters should not be submitted at all except if requested by the instructor.

Content:
- Sum up your conclusions in text and demonstrate them, if suitable, with figures and tables.
- In the manuscript, explain each of your consequences, and point the reader to remarks that are most appropriate.
- Present a background, such as by describing the question that was addressed by creation of an exacting study.
- Explain results of control experiments and give remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or manuscript.

What to stay away from:
- Do not discuss or infer your outcome, report surrounding information, or try to explain anything.
- Do not include raw data or intermediate calculations in a research manuscript.
- Do not present similar data more than once.
- A manuscript should complement any figures or tables, not duplicate information.
- Never confuse figures with tables—there is a difference.

Approach:
As always, use past tense when you submit your results, and put the whole thing in a reasonable order.

Put figures and tables, appropriately numbered, in order at the end of the report.

If you desire, you may place your figures and tables properly within the text of your results section.

Figures and tables:
If you put figures and tables at the end of some details, make certain that they are visibly distinguished from any attached appendix materials, such as raw facts. Whatever the position, each table must be titled, numbered one after the other, and include a heading. All figures and tables must be divided from the text.

Discussion:
The discussion is expected to be the trickiest segment to write. A lot of papers submitted to the journal are discarded based on problems with the discussion. There is no rule for how long an argument should be.

Position your understanding of the outcome visibly to lead the reviewer through your conclusions, and then finish the paper with a summing up of the implications of the study. The purpose here is to offer an understanding of your results and support all of your conclusions, using facts from your research and generally accepted information, if suitable. The implication of results should be fully described.

Infer your data in the conversation in suitable depth. This means that when you clarify an observable fact, you must explain mechanisms that may account for the observation. If your results vary from your prospect, make clear why that may have happened. If your results agree, then explain the theory that the proof supported. It is never suitable to just state that the data approved the prospect, and let it drop at that. Make a decision as to whether each premise is supported or discarded or if you cannot make a conclusion with assurance. Do not just dismiss a study or part of a study as "uncertain."
Research papers are not acknowledged if the work is imperfect. Draw what conclusions you can based upon the results that you have, and take care of the study as a finished work.

- You may propose future guidelines, such as how an experiment might be personalized to accomplish a new idea.
- Give details of all of your remarks as much as possible, focusing on mechanisms.
- Make a decision as to whether the tentative design sufficiently addressed the theory and whether or not it was correctly restricted. Try to present substitute explanations if they are sensible alternatives.
- One piece of research will not counter an overall question, so maintain the large picture in mind. Where do you go next? The best studies unlock new avenues of study. What questions remain?
- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

When you refer to information, differentiate data generated by your own studies from other available information. Present work done by specific persons (including you) in past tense.

Describe generally acknowledged facts and main beliefs in present tense.

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