

Brief Note on Acute Oxygen Therapy Questionnaire

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Description

Oxygen may cause serious consequences when administered wrongly. This study aimed to assess doctors' and nurses' knowledge of acute oxygen therapy and perceived delivery barriers. We conducted a cross sectional study among 202 healthcare providers (134 doctors and 68 nurses) in a Nigerian hospital. The validated Acute Oxygen Therapy Questionnaire (AOTQ), which consisted of 21 knowledge assessment questions, was self-administered by participants. Provider's knowledge was classified as good if the score.

Acute Oxygen Therapy

Overall, 26.7% had good knowledge of Acute Oxygen Therapy (AOT), 35.9% were aware, and 19.3% used the AOT guidelines. The commonest source of knowledge on oxygen therapy was medical/nursing school. The participants' mean knowledge score. Doctors in postgraduate training obtained the highest score among the participants. Most doctors and 23.5% of nurses considered oxygen as a drug. More doctors (52.2%) than nurses (14.7%) believed that a doctor's order was mandatory before oxygen administration, contrary to guidelines recommendations. Most nurses did not know that breathlessness does not always signify hypoxemia and that asymptomatic anemia was not an indication for oxygen. Concerning oxygen prescription, 39.7% of nurses and 64.2% of doctors knew that it should be prescribed to achieve a target saturation range rather than a fixed dose. In acute oxygen delivery in COPD, doctors and nurses exhibited poor knowledge of the appropriate device and flow rate. The reported barriers to oxygen delivery were: A shortage of oxygen supply, inadequate delivery devices, power outages and out of pocket costs.

A significant proportion of doctors and nurses had poor knowledge of acute oxygen therapy, poor awareness and infrequently used AOT guidelines, and reported pertinent delivery barriers that warrant educational and administrative interventions.

Oxygen accounts for about 21% of atmospheric air and is required by human body cells for function and survival. Inadequate blood oxygen can result in cellular dysfunction, organ failure, and death. Oxygen is like any other medical drug administered by doctors, nurses, and other healthcare workers; it can reduce mortality when used appropriately. When

administered wrongly, it may be harmful with severe consequences. Acute oxygen therapies are often instituted when there is hypoxemia or respiratory distress, suspicion of tissue hypoxia in conditions like severe anemia, severe sepsis, tissue poisoning, and shock. Too much oxygen was erroneously believed to have no untoward effect. However, recent clinical data from systematic reviews and randomized clinical trials on using acute oxygen therapy in patients with stroke and acute myocardial infarction have disapproved of this notion. Excessive oxygen administration can be harmful, especially in those pulmonary conditions associated with hypercapnic respiratory failure like COPD and pneumonitis from bleomycin or paraquat exposure.

Survey Instruments

The Acute Oxygen Therapy Questionnaire (AOTQ) was developed by a panel of pulmonologists, anesthesiologists, pediatricians, epidemiologists, and health educationists. It is a reliable and validated English language questionnaire to evaluate doctors' and nurses' knowledge of acute oxygen administration. The global content validity index was 0.85. The test retest reliability statistics showed a kappa coefficient of 0.546-0.897 ($P < 0.001$) and a percentage agreement of 80–98.3%, indicating high temporal stability in the target population.

The AOTQ has a total of 37 questions in eight sections consisting of knowledge; three on awareness and three on sources of information about oxygen therapy, two on time of last prescription and administration of oxygen therapy) and eight on demographics and professional profiles. The final five-section of this questionnaire included the following: Four questions on general knowledge of oxygen as a medical gas, five questions on recognition of hypoxemia and tissue hypoxia, four questions about indications for oxygen therapy with response options consisting of "true", or "false". In addition, two other sections on oxygen prescription and delivery practices contain four multiple-choice questions with one correct item, respectively. The weight for a correctly answered option is 1 point, and a "missing option" is considered an incorrect answer and scored 0.

An optional self-reported open-ended question asks participants to describe their experiences or feelings on the challenges of oxygen administration in the hospital ward and

emergency room. Questions about demographic and professional characteristics, time of last prescription and administration of oxygen, and sources of information about oxygen therapy had no assigned scores. Likewise, the questions about awareness and use of an oxygen therapy guideline and the open-ended questions have no scores. Instead, the score assigned to each respondent depends on the number of correct responses provided in the scoring. The AOTQ and its scoring are available in the supplementary materials.

Inappropriate administration can also lead to increased length of hospital stay, higher admission rates to high dependency units, and an increased risk of death. Uncontrolled oxygen administration, mainly when delivered at high concentrations, can worsen hypercapnia, primarily caused by hypoxic vasoconstriction. As a result of these documented harmful effects, safety agencies and several international respiratory societies have advocated for titrated oxygen therapy in this

vulnerable patient group. For safety reasons and accurate administration, the experts have opined that oxygen should be treated like any other prescription drug.

Our results show that less than one-third of the participants had good knowledge of Acute Oxygen Therapy (AOT). This result is supported by other studies showing significant knowledge gaps among healthcare staff. These findings could affect the assessment and optimal delivery of oxygen and the outcome of acutely ill patients. The poor understanding of AOT in this study was because most doctors and nurses lack awareness of and familiarity with the available international AOT guidelines and perhaps the absence of a local protocol and national guideline for oxygen administration. Another explanation for the unsatisfactory performance was the lack of sufficient attendance for Continuing Professional Development (CPD), as 20% of the participants in this study had attended training focused on acute oxygen therapy.