

An Exploratory Investigation of Cardiopulmonary Parameters ICU Patients Receiving Physiotherapy Rehabilitation in A Tertiary Teaching Hospital in Ghana

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Abstract:

Background: Given the high morbidity and mortality associated with critical illness, coupled with the limited evidence on cardiopulmonary responses to physiotherapy rehabilitation among intensive care unit (ICU) patients in resource-constrained tertiary hospitals in Ghana, this study provides empirical data to guide evidence-based rehabilitation strategies, optimize patient recovery, and improve clinical outcomes in ICU care. This study explored changes in cardiopulmonary parameters during physiotherapy in adult ICU patients at a tertiary teaching hospital in Ghana.

Methods: An exploratory study was conducted among 23 adult (mean age: 40.5±16.5years) ICU patients who went through a standard 44 physiotherapy sessions for 5 months with a mean length of ICU stay of 18.9±21.5days. Heart rate, respiratory rate, blood pressure, and oxygen saturation were measured pre- and post-intervention.

Results: Heart Rate ($103.3 \pm 19.4 < 106.5 \pm 19.4$ bpm) p-value=0.004, Respiratory Rate ($21.8 \pm 7.8 < 23.2 \pm 8.0$ bpm) p-value=0.079, Diastolic Blood Pressure ($84.9 \pm 12.7 > 84.8 \pm 13.3$ mmHg) p-value= 0.916, Systolic Blood Pressure ($136 \pm 2.8 < 138.79 \pm 21.8$ mmHg) p-value= 0.916, SpO₂= (97-100 < 98-100%) p value=0.367. Heart rate increased significantly following physiotherapy (p=0.004), while respiratory rate, blood pressure, and oxygen saturation showed no significant changes. Transfer and active mobilization elicited greater cardiovascular responses, whereas passive and respiratory techniques were associated with improved hemodynamic stability. Patient age, ICU stay, comorbidity burden, and session duration did not significantly influence cardiopulmonary responses.

Conclusion: ICU patients demonstrated heterogeneous baseline cardiopulmonary profiles, while physiotherapy interventions produced mild acute physiological responses, mainly reflected by increased heart rate. Cardiopulmonary responses were influenced more by physiotherapy interventions than by patient-specific factors.

Keywords:

Cardiopulmonary, Intensive Care Unit, Intervention, Physiotherapy, Rehabilitation.