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Challenges Faced by Adolescents and Lung Function Technicians During Spirometry: A Qualitative Study

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Background: Spirometry is the gold standard test to diagnose airway diseases. Challenges in conducting lung function testing on adolescents are poorly understood.

Objective: To assess the challenges and obstacles faced by lung function technicians when conducting lung function assessments in adolescents.

Methods: This qualitative study was conducted on adolescents aged 13-14 from Anuradhapura with severe asthma during their asymptomatic period and three lung function technicians with adequate knowledge but no prior experience performing spirometry in adolescents. Severe asthma was defined according to the International Study of Asthma and Allergy in Childhood criteria, and participants were randomly selected after excluding those with contraindications. Spirometry was performed according to standard American Thoracic Society/ European Respiratory Society guidelines. Lung function technicians gave verbal instructions, demonstrated breathing manoeuvres, used incentives, and executed breathing manoeuvres with the adolescents for training. Two investigators observed each participant during spirometry, taking independent field notes based on the reactions, interactions, and behaviours. In-depth semi-structured interviews were conducted with each participant and technician following the tests. Thematic analysis was used.

Results: Data saturation was achieved with 15 adolescents (7 male, 8 female). The qualitative data were analysed under three major themes: comprehending instructions, executing breathing manoeuvres, and perspectives. All participants reported comprehending instructions clearly although the technical performance varied. Synchronizing breathing manoeuvres with adolescents achieved optimal performance, although it was exhausting for the technicians. The most challenging aspect was obtaining accurate readings in forced spirometry, particularly the forceful exhalation in the first second and maintaining it for over 6-seconds. None of the parents or adolescents had prior knowledge of lung function tests, leading to apprehension before the procedure. Once the adolescents understood the process, they were cooperative.

Conclusion: Demonstrations and synchronized breathing manoeuvres for training, in addition to instructions, improve the overall quality of test performance.

Keywords: Spirometry, Adolescents, Qualitative study