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Exploring the students' perceptions of factors that enable or constrain the learning of neurophysiology at a South African metropolitan university: a qualitative study

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ABSTRACT

Some undergraduate medical and biomedical students grasp neurophysiology easily while others struggle to understand neurophysiology, suggesting that that there are factors that enhance or constrain epistemic access to neurophysiology. Students that struggle with neurophysiology concepts often fail to progress in terms of knowledge building and find it difficult to integrate and associate the control of other systems by the nervous system. The aim of this study was to explore and describe the undergraduate biomedical students' perceptions of factors that enhance or constrain the learning of neurophysiology at a metropolitan university in South Africa.

This was a qualitative descriptive study in which a general thematic analysis approach was used. Semi-structured interviews were conducted with a purposive sample of 10 male and female undergraduate biomedical students studying Physiology and registered in the Faculty of Health Sciences at a metropolitan university in South Africa. Interview transcripts were coded using MAXQDA for data management and analysed using a general thematic analysis approach. Students' perceptions of the factors that enhance or constrain the learning of neurophysiology including troublesome knowledge and potential threshold concepts were identified and described.

Findings show that students identified prior learning of biological concepts in high school, availability of learning resources and practical sessions as enhancing the learning of neurophysiology while the amount of work to be covered, language and terminology, pre-requisite knowledge of physical sciences and the existence of troublesome knowledge and potential threshold concepts were identified as constraining factors in the learning of neurophysiology. Neurophysiology topics such as somatosensory and somatomotor pathways, functions of the different regions of the brain and special senses were recognised as

troublesome knowledge while the generation and propagation of action potentials was described as a threshold concept that acted as a barrier to the learning of neurophysiology.

We conclude that exploring the students' perceptions of the factors that enhance or constrain the learning of neurophysiology could improve epistemic access to neurophysiology knowledge. This study suggests how academics can design physiology teaching to support students in the learning of neurophysiology. Thus to improve learning outcomes in neurophysiology, it may be important to address the factors that constrain the learning of neurophysiology. Moreover, provision of targeted support and resources for students to overcome potential barriers to learning may be useful in the teaching of neurophysiology.