





The health-related quality of life of undergraduate health and rehabilitation sciences students at a South African university during the COVID-19 pandemic

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Background. University students were affected by the COVID-19 pandemic due to sudden changes in learning practices including remote learning and lack of academic and social support amid fears of being infected with SARS-CoV-2. The impact of the pandemic on the health-related quality of life (HRQoL) of students in South Africa (SA) is not known.

Objectives. To determine the impact of the COVID-19 pandemic on the HRQoL of undergraduate Department of Health and Rehabilitation Sciences (HRS) students at the University of Cape Town, SA.

Methods. A cross-sectional study was conducted between July and September 2022 during the fifth wave of COVID-19 caused by the Omicron variant in SA. An author-generated questionnaire and validated 36-Item Short Form Survey (SF-36) were administered to all registered undergraduate HRS students. One-way analysis of variance (ANOVA) and independent *t*-tests were computed to determine associations between HRQoL and participant characteristics.

Results. There were 101 participants in the study, the majority of whom were between 18 and 23 years old, female (92%) and English home language speakers (67.3%). Significant differences in HRQoL were found in year of study ($p=0.03$, general health (GH)); financial aid support ($p=0.02$, GH); gender ($p=0.01$, energy/fatigue (EF)); degree programme ($p=0.01$, role emotional (RE)); and mental health diagnosis ($p=0.02$; EF, $p=0.02$; RE, $p=0.02$).

Conclusion. The HRQoL of university HRS students was significantly impacted by the COVID-19 pandemic and was positively associated with gender, year of study, academic programme, financial aid status and COVID-19 diagnosis. Health educators should be aware of the impact of a pandemic on students' HRQoL. Improved academic and psychosocial support should be made available to students during such times of crisis.

Keywords: health-related quality of life; university students; health and rehabilitation sciences; COVID-19; pandemic preparedness and support

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Health-related quality of life (HRQoL) refers to an individual's perceived wellbeing in the physical, mental and social domains of health.^[1] It measures the influence of health status, medical treatment, and health policies on one's wellbeing. The assessment of HRQoL data helps to identify subgroups vulnerable to poorer perceived health and to guide interventions that aim at averting more serious health consequences.^[2] HRQoL is crucial in maintaining a healthy lifestyle and has been successfully used to assess the health status of university students. Functional levels of HRQoL in health sciences students are important in the fulfilment of their role as caregivers and professionals. Sociodemographic and contextual factors may result in a decline in a student's HRQoL. These factors include high academic load, overwhelming clinical platform duties, financial difficulties, long working hours and lack of social support.^[3]

On 11 March 2020, the World Health Organization (WHO) declared a global pandemic in response to the rapid spread of the highly infectious SARS-CoV-2.^[4] The pandemic brought drastic changes to the academic schedules of university students, with the introduction of remote learning, which was meant to reduce potential exposure to SARS-CoV-2 infection.^[5]

The imposition of a national lockdown to help curb SARS-CoV-2 transmission also disrupted students' normal routines and affected their HRQoL.^[6]

The extent to which the COVID-19 pandemic affected the HRQoL of health and rehabilitation sciences (HRS) students in South Africa (SA) remains uncertain. Given that students' mental health can affect their academic performance, it is crucial to gain an understanding of the impact of extraordinary crises such as COVID-19 on their mental health. The current study aimed to determine the impact of the COVID-19 pandemic on the HRQoL of undergraduate HRS students at the University of Cape Town (UCT), SA. The study adds to the body of knowledge on strategies that health science educators may employ to better support student wellbeing, particularly in times of a public health crisis.

Methods

A quantitative cross-sectional study was conducted at the Faculty of Health Sciences, UCT, between June and September 2022 during the fifth COVID-19 wave. All registered undergraduate students from the HRS programmes, i.e. Physiotherapy (PT), Occupational Therapy (OT), Speech

Language Pathology (SLP) and Audiology, were eligible and therefore approached to participate in the study. A required sample size of $n=253$ was determined using a stratified Fisher's formula^[7] to ensure sufficient statistical power.

Ethical approval for the study was obtained from the UCT Human Research Ethics Committee (ref. no. HREC 173/2022) and institutional approval from the UCT Department of Student Affairs before data collection commenced.

Data collection

Recruitment was conducted through classroom announcements, messages on university media platforms and posters placed on campus. All HRS students were also emailed an online survey link through the university learning management system. Consenting participants provided informed consent and could withdraw from the survey at any time. An author-generated questionnaire collected sociodemographic data of participants, including age, gender, study programme, year of study, financial aid support, self-reported COVID-19 and mental health diagnosis. The 36-Item Short Form Survey (SF-36), a validated and widely used tool to assess HRQoL, was administered to all participants. The SF-36 is divided into eight domains: physical functioning (PF); role physical (RP); body pain (BP); general health (GH); energy/fatigue (EF); social functioning (SF); role emotional (RE); and emotional wellbeing (EW). Each domain score ranges from 0 to 100, with 100 representing less pain, less limitation or a higher functioning.^[8]

Statistical analysis

Data were analysed using the Excel Data Analysis ToolPack (Microsoft, USA). Categorical variables were presented as percentages and frequencies and descriptive statistics as means and standard deviations (SDs). One-way analysis of variance (ANOVA) was used to determine significant associations between HRQoL subscales and participant variables. An independent *t*-test compared scores by gender. A *p*-value of ≤ 0.05 was considered statistically significant.

Results

Sociodemographic variables of participants

The sociodemographic variables of the participants are summarised in Table 1. A total of 143 students responded to the survey, representing a 56.5% response rate. Of these, 101 responses were fully completed and therefore included in the final analysis. Respondents were predominantly aged between 18 and 23 years (92.1%), female (83.2%), from the SLP programme (42.6%) and English home language speakers (67.3%). About half of the participants had been diagnosed with COVID-19 (41.6%), while 20.8% had a mental health diagnosis during the pandemic.

HRQoL of HRS students

Table 2 illustrates mean SF-36 domain scores. The overall mean scores for six of the eight domains were <60 , while the RE and EF scores were <50 . The highest mean scores were in the PF domain and the lowest in the RE domain. Four domains were higher than the norms given by Ware^[9] (PF, RP, BP, GH, indicating better HRQoL in these domains). Conversely, four domains were lower than the norms (EF, SF, RE, EW).

Associations between HRQoL domain scores and sociodemographic factors were determined (Table 3). Males scored higher in five domains (GH, EF, SF, RE, EW), while females scored higher in three domains (PF, RP,

BP). Male students scored significantly higher than female students in the EF ($p<0.01$) and EW domains, respectively ($p=0.01$).

The GH domain scores were statistically significant according to year of study ($p=0.03$). Third-year students achieved the highest scores and first-year students the lowest ($p=0.03$). Third-year students also achieved the highest scores in the BP and SF domains, while second-year students attained the highest scores in the EF, RE and EW domains. For degree programme comparisons, significant differences were found in the RE domain ($p=0.01$), where SLP students scored the highest and OT students the lowest.

Students on financial aid support scored significantly lower in the GH domain than those without such support ($p=0.02$). Students without financial aid support achieved higher scores in seven of the eight domains (not statistically significant). Students with a COVID-19 diagnosis scored significantly higher than those without a BP diagnosis ($p=0.01$). However, students with no COVID-19 diagnosis generally scored higher for most of the domains, except for RP and BP. Finally, students without a mental health condition scored significantly higher than those with a mental condition in the GH ($p=0.02$), EF ($p<0.01$) and RE ($p=0.02$) domains. Students without a mental health diagnosis scored higher for all domains. The HRQoL scores were not significantly associated with age.

Table 1. Sociodemographic variables of health and rehabilitation sciences students (N= 101)

Participant characteristics	Frequency (%)
Age, years	
18 - 20	53 (52.5)
21 - 23	40 (39.6)
>24	7 (6.9)
Gender	
Female	84 (83.2)
Male	12 (11.9)
Non-binary	5 (4.95)
Academic programme	
Speech and language pathology	43 (42.6)
Audiology	28 (27.7)
Occupational therapy	15 (14.9)
Physiotherapy	13 (12.9)
Unspecified	2 (2)
Year of study (all degrees/disciplines)	
1	29 (28.7)
2	20 (19.8)
3	29 (28.7)
4	21 (20.8)
Unspecified	2 (2)
Financial aid support	
Support	59 (58.4)
No support	41 (40.6)
Unspecified	1 (1)
COVID-19 diagnosis	
Yes	42 (41.6)
No	58 (57.4)
Unspecified	1 (1)
Mental health condition	
Yes	21 (20.8)
No	78 (77.2)
Unspecified	2 (2)

Table 2. SF-36 scores (N=101)

Domain	PF, mean (SD)	RP, mean (SD)	BP, mean (SD)	GH, mean (SD)	EF, mean (SD)	SF, mean (SD)	RE, mean (SD)	EW, mean (SD)
SF-36 score	92.3 (21.1)	65.8 (47.5)	76.9 (23.7)	64.6 (27.3)	43.9 (24.2)	64.1 (28.1)	40.4 (49.1)	55.9 (28)
SF-36 norms (Ware ^[9])	70 (27.42)	52.97 (40.78)	70.77 (25.43)	56.99 (21.11)	52.97 (40.78)	78.77 (25.43)	65.78 (40.71)	70.38 (21.97)

SF-36 = 36-Item Short Form Survey; PF = physical functioning; SD = standard deviation; RP = role physical; BP = body pain; GH = general health; EF = energy/fatigue; SF = social functioning; RE = role emotional; EW = emotional wellbeing.

Table 3. Associations between SF-36 scores and sociodemographic factors

Domain	PF, mean (SD)	RP, mean (SD)	BP, mean (SD)	GH, mean (SD)	EF, mean (SD)	SF, mean (SD)	RE, mean (SD)	EW, mean (SD)
Age, years								
18 - 20	89.9 (17.1)	58.2 (40.6)	75 (23.7)	62 (19.5)	43.5 (18.5)	65.6 (27)	42.9 (41.8)	54.9 (20.3)
21 - 23	94.8 (9.5)	73.7 (38.1)	79.9 (19)	66.5 (19.6)	42.4 (18.3)	61.5 (24.4)	31.5 (42.3)	56 (19.7)
>24	97.1 (5.7)	67.9 (40.1)	76.4 (16.1)	69.3 (20.1)	52.9 (12.5)	69.6 (6.7)	46.1 (44.7)	67.4 (10.9)
p-value	0.18	0.31	0.56	0.44	0.37	0.63	0.3	0.29
Gender								
Male	86.4 (28.1)	45.8 (46.3)	75.4 (22.6)	74.5 (21.2)	60.7 (12.7)	70.8 (27.4)	44.4 (49.9)	69.7 (17)
Female	93 (11.5)	65.5 (39)	78.5 (20.2)	63.3 (19.1)	41.5 (17.9)	63.9 (24.2)	39.5 (42.6)	54.7 (19.3)
p-value	0.45	0.17	0.66	0.09	<0.0*1	0.42	0.73	0.01*
Academic programme								
Audiology	89.5 (19.3)	66.7 (41.9)	83.7 (17.7)	69.5 (18.5)	42.9 (18)	75.9 (21)	42.9 (43.4)	54.3 (20.5)
Speech and language pathology	92.6 (13.3)	60.9 (38.9)	76.9 (22.5)	64.5 (19.9)	46.9 (15.8)	76.7 (20.2)	52.1 (50.1)	58.5 (44.5)
Physiotherapy	92 (11.6)	79.2 (38.2)	70.8 (20.3)	65 (17.6)	43.3 (22.7)	66.7 (16.3)	33.3 (42.6)	56.3 (19.8)
Occupational therapy	96.1 (4)	58.9 (41.1)	74.5 (17.5)	55.8 (19.1)	38.9 (19)	70 (16.9)	9.5 (27.5)	56.3 (18)
p-value	0.57	0.52	0.24	0.17	0.49	0.34	0.01*	0.85
Year of study								
1	91.6 (17)	57.8 (39)	73.3 (19.4)	58.4 (17.9)	42.4 (20.9)	59.1 (28.9)	41.7 (46.8)	57.4 (23)
2	88.4 (18.9)	67.5 (44.5)	71 (25.5)	61.8 (19)	47.8 (15.6)	74.4 (22.4)	58.3 (46.5)	58.1 (17.4)
3	93.4 (9.3)	67 (37.2)	83.3 (21.8)	72.6 (16)	43.3 (16.3)	66.4 (24.6)	37.9 (43.4)	53.4 (18.6)
4	95.5 (9.4)	71.1 (42.7)	81.6 (14.5)	64.8 (23.6)	41.5 (19.1)	59.4 (20.2)	26.3 (32.5)	56.6 (19.4)
p-value	0.45	0.6	0.1	0.03*	0.69	0.13	0.16	0.83
Financial aid								
Support	90.7 (16.6)	63.7 (40)	76.7 (20.7)	60.6 (19.5)	42.5 (18.2)	69.9 (21.2)	39.7 (43.1)	56.7 (20.7)
No support	94.8 (8.9)	66.7 (40.2)	77.6 (22.6)	69.8 (18.5)	45.6 (17.9)	70.9 (16.1)	40.8 (45)	55.6 (18.2)
p-value	0.16	0.72	0.84	0.02*	0.4	0.8	0.9	0.79
COVID-19 diagnosis								
History of COVID-19	91.8 (14.4)	73.7 (37.1)	83.7 (14.8)	61.6 (18.6)	41.5 (17.9)	62.2 (26.5)	36.9 (41.4)	51.9 (18.5)
No history of COVID-19	92.6 (14.1)	58.7 (41.2)	72.6 (24.3)	65.7 (20.3)	45.1 (18.4)	64.9 (24.0)	41.2 (44.9)	59.2 (20.3)
p-value	0.77	0.07	0.01*	0.31	0.33	0.6	0.64	0.08
Mental health condition diagnosis								
Yes	91 (16.51)	63.75 (38.4)	73.25 (21.7)	55.2 (23.1)	33.25 (14.5)	61.25 (23.96)	18.51 (36.5)	50.2 (20.25)
No	92.54 (13.63)	64.8 (40.5)	77.69 (21.3)	66.63 (18.0)	46.4 (17.9)	64.9 (25.5)	45.39 (44.1)	57.77 (19.45)
p-value	0.67	0.92	0.41	0.02*	<0.01*	0.56	0.02*	0.13

*Statistically significant differences (p<0.05).

SF-36 = 36-Item Short Form Survey; PF = physical functioning; SD = standard deviation; RP = role physical; BP = body pain; GH = general health; EF = energy/fatigue; SF = social functioning; RE = role emotional; EW = emotional wellbeing.

Discussion

This study sought to determine the impact of the COVID-19 pandemic on the HRQoL of HRS students at UCT. Overall HRQoL scores were higher than norms in the PF, BP, RP and GH domains, which are strongly associated with physical health, and low in the EF, SF, RE and EW domains,

which are strongly associated with mental health status. The finding of poor mental health status is consistent with previous research showing the heightened presence of mental health challenges among SA students, especially during the COVID-19 pandemic.^[10] Previous studies reported how students experienced psychological problems such as anxiety and

depression, which impacted negatively on their studies and resulted in low HRQoL scores during the COVID-19 pandemic.^[10,11]

Male students scored significantly higher than female students for the RE and EF domains, which are strongly associated with emotional wellbeing. Previous studies have attributed the poorer HRQoL scores in female health sciences students to increased levels of stress, higher rates of mental health problems, lack of support and a competitive academic environment within university settings.^[12,13]

Research conducted during the pandemic has illustrated that female students tend to have a higher perception of risk for COVID-19 and resultantly higher levels of anxiety than their male colleagues.^[11]

Significant differences in HRQoL were found in students across different years of study, particularly in the GH domain ($p=0.03$), where first-year students reported the lowest scores compared with more senior students. This finding is consistent with those in previous studies suggesting that students in lower years of study had a lower HRQoL, possibly due to the need to adapt and adjust to the transition from high school to university.^[14] Also worth noting is that the then first-year students had come to university after emerging from a final high school year that was significantly to be affected by school closures due to the spread of SARS-CoV-2. These stressful circumstances possibly impacted negatively on their HRQoL. Furthermore, second-year students scored the highest in the emotional function domains (SF, RE, EW). This outcome is similar to that of Latas *et al.*,^[15] who found that clinical students (second year and higher in HRS) had a better HRQoL because they had developed improved strategies to cope with and manage their academic workload.

Statistically significant differences were found for academic programmes in the RE domain ($p=0.01$), where SLP students scored the highest and OT students scored the lowest. Differences in HRQoL between degree programmes have previously been reported.^[9] There were no statistically significant differences in scores for the remaining seven domains. A similar trend was observed in previous studies, where Murakami *et al.*^[16] noted no significant difference between OT, SLP and PT students when assessing for the presence of physical and psychological stress. It can therefore be concluded that the absence of differences in the remaining seven domains between the academic programmes may indicate that the HRQoL scores are independent of the nature of the academic programme, which is to be expected, as HRS programmes are housed in one department with similar teaching methodologies and student support services.

Students who received financial aid support had overall lower HRQoL scores. This is in keeping with findings by Van den Berg and Raubenheimer,^[17] who reported that SA students on financial aid support had a lower HRQoL due to food insecurity and insufficient funds to cover tuition, accommodation and food. The students on financial aid support largely come from low-to-middle income households and therefore the pandemic could have had a greater socioeconomic impact on them. In addition, Van den Berg and Raubenheimer^[17] found that students often felt obliged to send home a portion of their financial aid allowance to support their families at the expense of their financial stability and wellbeing while at university.

The current study further revealed that participants with a COVID-19 diagnosis had overall lower HRQoL scores, except for BP scores, which were significantly better than those for students without a COVID-19 diagnosis. While the latter was unexpected, the result is consistent with research on long COVID by Coen *et al.*,^[18] who found that COVID-19 could temporarily blunt pain perception. However, participants without a COVID-19 diagnosis

reported higher HRQoL scores for the remaining seven domains, which is consistent with prior research by Poudel *et al.*^[19]

Students who had been diagnosed with a mental health condition scored significantly lower than those without such a diagnosis for the domains RE, EF and GH. This finding is consistent with that of Berghöfer *et al.*,^[20] who found that students with a mental health diagnosis had overall lower mean HRQoL scores. This may be due to such students experiencing elevated levels of emotional exhaustion, burnout, de-personalisation and low levels of personal accomplishment.^[19] Van der Walt *et al.*^[21] noted poorer HRQoL in health sciences students and identified a mental health condition, gender, sexual orientation and year of study as significant predictors. A detailed analysis of the mental health and substance use characteristics of the HRS students in this study is reported elsewhere.^[22]

Study limitations

A few limitations were noted in this study. Firstly, the small sample size and low response rate due to the limited data collection period could have affected the study's statistical power. Secondly, the questionnaire relied on self-reporting, with the risk of introducing recall bias. This was minimised by maintaining participant anonymity, the use of interval questions and clear and concise language in the questionnaire. The study was conducted at one university, which limits its generalisability to all departments of HRS in the SA context. Because of the cross-sectional design of the study, it is not possible to draw causal inferences. Despite these limitations, and to our knowledge, this is one of the first studies to assess HRQoL in HRS students within an SA university. It therefore adds significant knowledge to the body of work assessing the wellbeing of students, with the aim of improving their university experience.

Conclusion

This study successfully described HRQoL in a cohort of HRS students at UCT. Key observations revealed gender, year of study, academic programme, financial aid support, mental health status and COVID-19 diagnosis as factors that influence HRQoL status in students. These results can inform health science educators about the impact of crisis situations on the wellbeing and academic performance of students. Initiatives aimed at enhancing students' mental health and wellbeing should be prioritised. These initiatives, including mental health services and social support groups, could aid in promoting resilience and improving HRQoL in subsequent cohorts of HRS students at SA universities. Future longitudinal and interventional studies would be beneficial in understanding the cause-and-effect mechanisms that determine HRQoL in HRS students within the SA context.

Data availability. The data sets generated and analysed during the current study are available from the corresponding author upon reasonable request.

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ZSC and IN supervised the research project protocol development, data collection, analysis and write-up. All authors critically reviewed the manuscript.

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