A qualitative study exploring experiences, attitudes, and wellbeing of university students of a period of restricted movement and self-testing during COVID-19 “Incoming Student Wellbeing and Benefits of Serial COVID-19 testing (ISWAB)” study [version 1; peer review: awaiting peer review]

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Abstract

Background: As part of Ireland’s response to the COVID-19 pandemic, travellers to Ireland were required to restrict movements on arrival. Worldwide compliance with measures such as quarantine and testing vary and are influenced by factors including an individual’s knowledge of trust in, and attitudes towards these measures. The aim of this study was to explore student experiences of restricted movements after entering Ireland from abroad and to assess the acceptability and feasibility of self-administered SARS-CoV-2 tests.

Methods: The Incoming Student Wellbeing and the Acceptability and Benefits of serial COVID-19 testing (ISWAB) study recruited university students who travelled into Ireland and were required by national public health guidance to restrict their movements. As part of the study, students were provided with SARS-CoV-2 self-test kits. This qualitative study explored the students’ attitudes to self-testing and restricted movements using focus groups and interviews. Ethical approval was obtained. Interviews were conducted until data saturation was reached. Interview transcripts were thematically
analysed.

**Results:** Of 41 ISWAB participants, 32 agreed to participate in a follow-up qualitative study providing written consent. One focus group, two group interviews and three individual interviews were conducted in August 2021, on Microsoft Teams. Among the 11 (seven male, four female) students interviewed, self-testing was considered feasible and acceptable. Facilitators of adherence to restrictions included: support with grocery shopping and study periods coinciding with quarantine. Barriers to well-being included: living alone, being an individual who leads a social lifestyle, and the number of days of quarantine completed.

**Conclusions:** This qualitative study demonstrated high levels of compliance with restriction of movement guidelines and self-testing, with limited impact on general well-being. Self-testing for SARS-CoV-2 was found to be practical and achievable for at home use by participants in this study. The findings of this study may inform future self-testing initiatives.

**Keywords**
COVID-19, Pandemics, Public health guidelines, Qualitative, Self-testing, Wellbeing

This article is included in the Coronavirus (COVID-19) collection.
Introduction
The World Health Organization declared COVID-19 as a pandemic on the 11th of March 2020. The first COVID-19 case in Ireland was identified on 29th February 2020. The pandemic continues to evolve globally, with the emergence of variants of concern (VOCs). These VOCs result in increased transmissibility, morbidity, mortality, and socio-economic disruption. Public health restrictions, vaccinations and non-pharmaceutical interventions were implemented globally, in response to the pandemic.

Public health interventions including school and third level-institution closures, national travel restrictions and physical distancing were first introduced in Ireland in March 2020. A high degree of public compliance with these restrictions was observed. Travellers arriving in Ireland, from February 2021, whether they were Irish or non-Irish residents were required by law to restrict their movements for 14 days. Before this, in July 2020, the Irish Government published a ‘green list’ of countries with low COVID-19 incidence. Passengers arriving in Ireland from non-green list countries had to restrict their movements for 14 days.

A recent rapid review suggests that the psychological impact of quarantine varies, is significant and can be long-lasting. However, it also acknowledges that the psychological impact of not following quarantine guidelines and facilitating viral spread may have had a greater negative impact. Another study, involving university students required to quarantine during the H1N1 epidemic concluded that quarantine did not have negative psychological effects after a period of seven days of quarantine.

Although self-testing was not routinely used in earlier phases of the COVID-19 pandemic in Ireland nor recommended by the National Public Health Emergency Team, self-testing became more widely accepted and used in later waves of the pandemic. The Health Information and Quality Authority released a report in September 2021 stating that self-administered antigen tests may have a role in preventing asymptomatic transmission of COVID-19. Early studies considered saliva as a reliable biological fluid suitable for diagnostic rapid SARS-CoV-2 tests. Further studies investigated the acceptability of self-administered finger-prick COVID-19 antibody tests and saliva tests. Study participants found these tests to be easy to use, convenient, informative, and cost-effective.

Literature in this area mainly focuses on the general population and on quantitative studies, investigating the efficacy of self-testing. Few studies focus on participants’ experiences of a time of restriction of movements combined with a self-testing regime. The aim of this study was to explore student experiences of self-isolation after entering Ireland from abroad and to assess the acceptability and feasibility of self-administered SARS-CoV-2 tests.

Methods
Ethical approval
Ethical approval for this study was first granted by the Clinical Research Ethics Committee of the Cork Teaching Hospitals (CREC) for the original ISWAB study on 08/09/2020 (Ref: ECM 4 (b) 08/09/2020 & ECM 3 (ii) 10/08/2021). The approval from this date included permission to contact participants about participating in a follow up qualitative study. Thereafter, permission to conduct focus groups and interviews as part of this qualitative study was later fully approved by CREC as an amendment on 04/08/2021 (Ref: ECM 4 (b) 08/09/2020 & ECM 3 (ii) 10/08/2021). Interviews took place only after this approval date. Participants provided written informed consent. This was signed and dated electronically over email by each individual who took part.

Study design
A qualitative study, using focus group and semi-structured interviews was conducted among participants in the ISWAB study. The ISWAB study recruited students arriving in Ireland from non-green list countries. According to government policy at the time all people arriving in Ireland from non-green list countries were required to restrict their movements for 14 days on arrival. The ISWAB study was designed to assess the acceptability and feasibility of serial testing for SARS CoV2. This qualitative study provides an assessment of students’ experiences and attitudes to self-testing and movement restriction.

A combination of interviews and focus groups were chosen for two primary reasons. The first was for pragmatic reasons, as participants were living in different time zones, it was important we found a time to suit everyone, so we could include the attitudes and opinions of as many individuals as possible. Allowing the option to join a group or arrange an interview at a different time was therefore pragmatic. Therefore, the number of participants in each session was determined by participant availability. Additionally, we hypothesised that using multiple data collection methods would increase the credibility of our studies’ findings through data triangulation.

An exact number of individuals from a certain gender/sex was not considered in the design of this study as the sample to recruit from was limited. We aimed to include all genders in this study as they each have their own attitudes and opinions on their experience in the ISWAB study.

Study sample and setting
ISWAB study participants were university students who entered Ireland from abroad and therefore, were subject to a restriction of movement period according to Irish government guidelines. All 41 ISWAB participants were invited to participate in this qualitative study and 32 agreed to participate. These 32 students were emailed an invitation to participate in a focus group or interview. The sample of 32 students was chosen because this qualitative study was based on the original ISWAB study. Ethical approval was only in place to contact those who had agreed at the end of the original study to be contacted about a follow up qualitative study.

Topic guide and interviewing
The interview topic guide (Table 1) was based on study objectives, existing research, and the experience of the research team. Additionally, the topic guide was based on the same themes as the survey sent to the participants in the ISWAB study. A pilot
focus group was conducted. No revisions were made to the topic guide following this and the focus group was included in the final analysis.

Data collection
All 32 ISWAB participants who consented to participate in the qualitative study were invited to attend an interview or focus group. These were conducted in August 2021, on Microsoft Teams by MMG. Focus groups and interviews were recorded and transcribed verbatim by MMG, with the permission of the participants.

Data analysis
Interviews and focus group data were analysed using Braun & Clarke’s inductive thematic analysis on NVivo software (RRID: SCR_014802) [release 1.5.1 (940)]18. An alternative non-proprietary software which could be used is Taguette. Inductive thematic analysis was chosen because inductive thematic analysis generally provides a broad and expansive analysis of the whole body of data collected and researchers felt this was the most suitable for the topic being analysed. Firstly, familiarisation with transcripts occurred. The authors decided it would be best to analyse interviews and focus groups together. Firstly, because the same topic guide was used for interviews and focus group and additionally because similar issues emerged from all interviews, regardless of whether a focus group (two or more participants), group interview (two participants), or one-on-one interview was conducted. MMG coded all transcripts independently using both semantic and latent codes. Codes were sent to another author (EB) who then subsequently and independently coded the transcripts. Themes were independently created, compared, discussed, and reviewed. MMG and EB then met to discuss any discrepancies between the themes generated. All authors agreed on a final set of themes and subthemes.

Data saturation occurred as a point was reached during analysis where no new themes emerged. Quotations representative of each theme and subtheme are available in the results section. Reporting was guided by the Consolidated Criteria for Reporting Qualitative Studies (COREQ) checklist19.

Reflexive statement
The main focus group facilitator and interviewer was a female researcher. This individual has experience in the area of health research and had undertaken previous training on conducting interviews and focus groups. An introduction and explanation of the rationale for conducting the interviews/focus groups facilitated in building a relationship between the researcher and participants. The researcher was also not known to the participants, which may have created a more comfortable environment for sharing attitudes and opinions.

Results
One focus group, two group interviews and three one-on-one interviews were conducted (37). Interview participants included: Seven male and four female subjects. Gender was based on self-report by participants. Interviews ranged from 21 minutes to 54 minutes. Participant quotes are represented by “P” and a number, which corresponds to the order in which participants were interviewed.

Predominant themes
Six main themes and 14 subthemes were generated from the data. The main themes were: Practicalities of following restrictions; Motivators and demotivators for following restrictions; Travel experience; Feasibility of self-tests as a long-term strategy; Experiences with self-testing; Health and well-being. See Table 2 for details.

### Table 1. Summary of interview topic guide

Table 1 is a condensed version of the interview topic guide used in focus groups, group interviews, and one-on-one interviews in this qualitative study. The area or topic of questions asked is seen in the first column and the issues which were discussed as a result of these questions is seen in the second column.

<table>
<thead>
<tr>
<th>Area</th>
<th>Issues discussed</th>
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<tbody>
<tr>
<td>Experience of restrictions</td>
<td>• Initial experience exiting the plane on arrival to Ireland</td>
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<tr>
<td></td>
<td>• Information acquisition about current restrictions</td>
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<tr>
<td></td>
<td>• Motivators/demotivators for following restrictions</td>
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<tr>
<td>Health and well-being during the quarantine period</td>
<td>• Overall feelings in quarantine compared to a usual/normal two-week period</td>
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<td></td>
<td>• Changes in feelings as time progressed into the two-week period</td>
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<tr>
<td></td>
<td>• Things which had an impact on the isolation period</td>
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<tr>
<td>Experiences of the self-testing process</td>
<td>• Self-administration of test</td>
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<td></td>
<td>• Instructional videos</td>
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<td></td>
<td>• Process of collecting and preparing samples</td>
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<td></td>
<td>• Receiving results</td>
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<td>Feasibility of self-testing for students</td>
<td>• Feasibility of self-testing for students</td>
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<td></td>
<td>• Comparison of self-test to a healthcare professional performed test</td>
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<td></td>
<td>• Positive things about the processes and suggested changes</td>
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**Note:** The table is not properly formatted in the provided text, but the content is included in the main body of the document. The table should be properly formatted in the final version of the document.
Participants discussed several sources of information regarding current COVID-19 public health guidelines. This information included travel-related information, as well as general guidelines and information about isolation rules in Ireland at their time of arrival. Most participants mentioned a government source such as the Health Service Executive (HSE), the Government of Ireland website, and Citizen’s Information. Citizen’s Information provides information on public services and on the entitlements of citizens in Ireland. Participants stated that they had to check these sources frequently, as restrictions were subject to change regularly and quickly. “I think so, yeah, we just looked at the HSE like right before we travelled because they were changing so frequently.” (P8)

Furthermore, some non-government sources were mentioned for providing guidance regarding both general and travel-related COVID-19 information. These included the International Student’s Office in the participant’s university, as well as the university itself and information from airlines.

“The international office was really helpful as well. If there’s any questions that we had about anything, even if it was, uh, like immigration related stuff, international office was really helpful on that.” (P1).

**Barriers and enablers to following COVID-19 public health guidelines.** Certain barriers and enablers to following restrictions were discussed by participants. This included discussion of restriction of movement periods, where participants were not actually positive for COVID-19 but had to restrict movements after entering Ireland from abroad. Not being confined to one single room and the ability to socialise with other members of the household were both mentioned as enablers. This occurred as several members of some households had travelled together to Ireland, and therefore could complete their restriction of movement ‘stay at home’ period at the same time, while socialising within the household. Therefore, as participants felt less alone, they explained that it was easier to follow other public health guidelines, for example, not seeing others outside of their household.

“Yeah, definitely being able to come out of our rooms and um, being able to socialise together really, really helped, like I feel like if we were inside our rooms, I don’t know how we could’ve done it” (P8).

One participant agreed with this point of view as they explained that quarantining alone when they arrived in Ireland was much more stressful than when they were previously quarantined in a household with others. This acted as a barrier to following public health guidelines.
“...it was the same in [country], we cannot leave our house or so. I had friends in [country mentioned] with me, so it was easy because, because I can socialise with them uh, but here, I didn’t have friends and just I was like, I just arrived in Ireland, and I was alone and then I had to stay at one place like for whole day, for like straight like 14 days, so that was quite, I think that was quite stressful...” (P2).

Additionally, the level of restrictions applied to the general population at the time was also mentioned as an enabler. For example, where establishments such as restaurants and bars were closed and the general population could not attend them, some participants found it easier to stay at home. Participants explained that this enabler was two-fold. Firstly, there was a sense that everyone was in the same situation, so although participants were restricting their movements, those who were not after travelling recently were in a similar situation to those who had. Additionally, as many parts of society were closed due to government guidelines there was not as much a desire to break the restriction of movement guidelines, as leisure activities in these establishments could not be carried out.

“It’s not like anything was open at the time anyway, so” (P4).

Those who completed their restriction of movement guidelines at a time when hospitality and leisure establishments could open explained that it was difficult to witness others engaging in activities they could not, due to public health guidelines at the time.

“...we can see our friends, some of the people who came before us already finished their quarantine, they were going out and we would be sitting inside the house and watching outside, so that was kind of like, ah, difficult feeling...” (P4)

In one case, a participant detailed how it was strange having to avoid family in the same household after returning to the family home from abroad, and how this acted as a barrier. It was difficult having travelled away from family and on return, having to avoid them. Additionally, the participant explains that when they arrived home, their presence affected how others in the household could act, as they too were required to restrict their movements.

“It was very strange, I have a big enough family, but it was very strange that they were like restricting their movements even though, like just because I was home and that but yeah, it’s a bit weird as well like having your own family avoid you for a while” (P10).

In other cases, participants mentioned how certain activities they needed to carry out were required to be done in person and this made following restrictions more difficult. In this way, following restriction of movement guidelines reduced certain opportunities and caused inconveniences if guidelines were followed. One participant explained how finding rental accommodation was made more difficult.

“Yeah, so for me it was like since I couldn’t find any house uh, like for as a permanent accommodation it was more for it was quite demotivating for me to ah, like ok like, I’m getting, like you know how the housing market of [Irish city] is, if you don’t go for a viewing, like you won’t get the place so, that was demotivating” (P7).

Another participant explained that they had a similar experience with obtaining a phone and phone plan. The lack of access to these services online caused a barrier which resulted in the participant having to enter a shopping centre to obtain what they required.

“...I also had to get a phone plan. So, I couldn’t do that in person, if I didn’t have, I mean I couldn’t do that online if I didn’t have a phone to begin with. So, I had to go to the mall and get, you know, a phone plan from there...” (P1)

Routine during restriction of movement period. Participants discussed several activities they undertook during their daily routine while restricting their movements. Many participants mentioned that keeping active was important for them, going for walks, particularly at quiet times or exercising inside.

“It was pretty easy like we just stayed in the house the whole time, we got our groceries delivered, we would like stay active inside and then we would like go for little walks (P8)“.

Others discussed how it was difficult to incorporate exercise into their routine, as workouts had to be undertaken at home, as opposed to being outside, going to the gym, or playing sports.

“...it was kind of tough like, you really lose the motivation to stay physically active when you’re in your room all day, you know. Um, it’s hard to like go from your bed to your desk, back to your bed and then like try and still be motivated enough to plan like an at home workout, you know...” (P6)

One participant explained how in a previous quarantine period in another country, outside exercise was prohibited, thus making the quarantine period and establishing a routine more difficult.

“...Yeah, I’d say definitely because in [country name], I don’t think we were allowed the small walks and things and that definitely, that quarantine felt a lot harder than this one...” (P9)

Some participants went shopping for groceries in person once-off or several times during the restriction of movement period.

“...Yeah, and I had to go to a shop and stuff just to buy the essentials...” (P11).

In general, it seemed that grocery shopping was incorporated into the routines of some participants, as more of an essential trip for food, not an attempt to leave their accommodation for other reasons.
Most participants mentioned that motivated not to contribute to a worsening situation.

Participants spoke about how it was demotivating having no choice but to leave the house for essential items. Many participants would not have had essential items available to them when they arrived in Ireland. Therefore, participants had to purchase items which could not be obtained online, in-person.

“You don’t know where you can get stuff and like, there mostly will be like a lot of things that you need once you land in a new place and definitely luckily for me, there were a lot of things that was already set up for me, by our landlord. He was very helpful, but it may not have been the case for others.” (P4)

Additionally, several participants discussed spending their time during this period completing assignments or studying for college examinations. The timing of the restriction of movement period for some participants meant that it coincided with the exam period. Participants stated that as result, they would have followed a similar routine, even if not restricting their movements.

“...I had established pretty much a routine at the time, I would wake up at like around noon, like again, kind of jet lagged, and I would literally just watch tv for a few hours with breakfast and um, I would kind of go into exam mode or study mode...” (P5).

Additionally, other participants mentioned that they planned the timing of their restricted movements. This was because if it was during an exam period, then their routine during restriction of movement would not have been much different to a regular exam week, which would mainly consist of studying. This meant that the restriction of movement period had minimal impact on routine, for those who planned it this way.

“...I timed my other quarantines like when I came home and then back in Ireland and then when I came back in May, they were all timed so that when I was in quarantine or isolation, I was studying for exams, anyway...” (P6)

Motivators and demotivators to following restrictions

Most participants mentioned that playing their part in preventing the spread of the virus in the population was important in motivating them to follow restrictions.

“I think kind of just the whole kind of public safety angle, basically, obviously it was another kind of intense time for covid restrictions and for the spread of Covid, so I was eager to not play my part in spreading it” (P5).

Participants explained that they did not want to be responsible for bringing in an extra case to the country and causing further spread, especially as cases numbers were high at the time in Ireland. In this way, participants indicated that they were aware of the epidemiological situation at the time and were motivated not to contribute to a worsening situation.

“I suppose what motivated me was at the time the cases were rising in Ireland. I remember coming in September, ahem, and I was conscious, of you know, being someone who, variants weren’t a thing at the time, but just bringing in a case um and you know spreading it so...” (P2)

Overall, participants were apprehensive and fearful regarding new variants of concern. The rate at which the Alpha, “U.K.” variant was spreading at the time motivated several participants to follow restrictions and reduce the risk of catching or spreading the virus.

“Yeah, the UK variant definitely kept us inside” (P8).

Concern was also expressed regarding keeping family members or those more vulnerable in society, safe. Participants highlighted that this was especially true considering the emergence of a new variant, of which little was known about at the time. There was an understanding among many participants that some members of society could become seriously ill from the virus, and that preventing this harm was a source of motivation for adhering to guidelines.

“...the main things that motivated me was just trying to keep my family safe, trying to keep my parents and that, my mom’s quite asthmatic, so I did feel like an awful lot of guilt coming home then and knowing there was this UK variant...” (P10).

One participant stated that being part of a study motivated them to follow restrictions as they knew they would be being tested and receiving results. There was a sense that personal responsibility was very important, and they felt that if one tested positive for the virus, there was blame or fault on the individual. That is, an individual could have prevented contracting the virus if they had followed the rules more carefully. Therefore, it was motivating to follow the rules.

“...just having like the ISWAB kit knowing that you’re part of a study kind of made you feel motivated to follow the restrictions because like if you saw other people that could like mess up or it’s like you could get covid and then it’s like why did you get covid? Because you didn’t follow the rules but I’m in a study, so I probably should have been following the rules so, I thought that was pretty motivating” (P8)

Contrastingly, many participants spoke of demotivators, which they suggested made them less eager to follow restrictions. Some participants mentioned others not following rules. One participant spoke specifically about those who were supposed to be enforcing rules, such as police, not abiding by them. It was explained that this situation was very frustrating and demotivating. This participant noted that if those who are policing the pandemic restrictions cannot practice the restrictions themselves, how are others to believe they are effective or worthwhile.
“Like, a bit upset for following everything, because for example, I was in like the tram system, and they have like, the like the, I don’t know what you call them, but like the subway police or the equivalent and they’re just walking around and there’s people with no mask and they don’t care and they’re like making jokes with them. And like if you’re not even gonna enforce your own rules, like so obviously then, like it’s really frustrating” (P3).

Participants also expressed how the perceived ‘high risk’ category of those who had travelled abroad was demotivating. In comparison to those who were constantly engaging in high-risk activities in Ireland, those who had travelled from abroad were subject to more restrictions, even if they came from a low-risk area, in some cases.

“…you could hear people having parties, but like, you know, even though, I suppose I was perceived as being higher risk because I came in from abroad. There were gatherings happening that, you know, would have been, multiple times riskier…where I was, the cases were very low compared to Ireland. So, I was kind of coming from a low risk to a medium risk area, so that was kind of, demotivated me…” (P2)

Health and well-being

Quarantine period. Overall, participants expressed differing experiences of their restricted movements. Some acknowledged that being confined to one space or having ‘cabin fever’ (P6) had a slight negative impact on them, with some stating that being confined to this area made it difficult to exercise.

“I try to be physically active for some period of the day everyday if I can um, so it was kind of tough like, you really lose the motivation to stay physically active when you’re in your room all day, you know” (P6).

Exercise appeared to play an important role in the well-being of participants. One participant explained that due to living in the countryside, the participant had access to more outside space, in a lowly populated area. Exercising in fresh air seemed to improve well-being levels among many participants. One participant found that completing “…a really early walk when I knew no one else would be out…” (P10) was helpful.

Another explained how even using the garden for exercise contributed to improved well-being during the restriction of movement period.

“…it’s nice that we have a backyard so we could do some exercise out there…” (P9)

For some participants, the restriction of movements period had a minimal impact on their health and wellbeing, with one participant explaining they did not find the process mentally challenging.

“Honestly, I was grand…I had days where I was just like ‘Oh God’ but that might be one day in the lot, and I can’t say that I wouldn’t have it during another two-week time.” (P11).

Finally, the anxiety caused by worrying about a potential COVID-19 infection after travelling was also mentioned. Participants noted that planes could be quite confined spaces, where COVID-19 could spread. Any sort of sickness or symptoms prompted some fears about testing positive for the virus while restricting movements. This caused stress in some participants.

“…I guess the psychological anxiety, cause you’re thinking, do I have covid? Do I not? Like any weird cough or any weird sneeze in the two weeks when you arrive, you’re like, oh no…” (P1)

“…You’d be almost wondering, do I, have it? You know um, cause and also when you come back, if you’re on, back from a plane ride, and I suppose it’s especially for people if they have more long-haul plane rides, you’d kind of be a bit sickly after them anyway…” (P2)

Self-testing. Some participants acknowledged the stress and anxiety caused by performing the tests themselves, rather than a healthcare professional. Some anxiety was also associated with waiting for the test results. Participants were apprehensive about what the result would reveal about their COVID-19 status, and its consequences.

“…it was still a little bit nerve wracking when you’re waiting for the bars to, waiting for the symbols to come up on the pinprick test…” (P2)

Additionally, some participants expressed concern related to incorrectly performing the test. One participant explained how they knew the kits were a finite resource and did not want to waste them by incorrectly performing the test.

“I was just a little stressed about maybe doing things incorrectly and then submitting my samples and then being kind of useless and then being like ‘what did I do all this for?’ you know they could’ve used the kit on someone else or, but other than that it was fine.” (P6).

However, most participants revealed that once the test was performed and appeared to work, they were relieved. Many of the participants also mentioned that the self-tests provided a sense of reassurance that they were not infected with COVID-19 currently in the case of the antigen test (saliva test) and had not been infected with COVID-19 in the past in the case of the antibody test (pin-prick test).

“It gave a nice reassurance for, just kind of like I obviously knew it was nothing official” (P11).

“…it was a relief to know that not only, that I didn’t have covid at the time, but I had never previously had covid which was a bit reassuring…” (P5)

Experiences with self-testing

Self-testing in general. The majority of participants indicated that the overall process of self-testing was feasible and “positive” (P1). Despite some problems with the pin-prick test, participants
were generally satisfied with the process indicating they would complete it again if required.

“I’d say the whole process overall was very easy.” (P2).

One participant mentioned that the days on which they were instructed to use the tests caused confusion. Additionally, they mentioned that throughout the process they forgot what days to complete the pinprick and saliva tests. Participants offered suggestions for improvements related to this, discussed in the theme (improvement to the process).

“Sometimes the days get mixed up” (P8).

**Pinprick test.** The majority of participants reported pain or discomfort with pin-prick tests. The gauge of the needle being a bit ‘thicker’ (P6) than what they expected was one reason suggested for this.

“I thought that was pretty easy as well, the prick hurt a little bit more than I expected it to, maybe...” (P6).

Additionally, some participants noted this increased pain may have been due to the area of the finger they pricked and that taking the sample became easier and more acceptable with practice.

“...but once I got that first time done like I was pretty confident that second time, it was like a breeze, so there was no issues...” (P4).

Finally, it seemed that those studying health or science-related disciplines found performing the test easier, perhaps because they had used the device before and had previous knowledge of these tests.

“The finger prick was super easy I had used those personally before for labs in undergrad and it wasn’t painful, super easy to understand” (P8).

**Saliva test.** Nearly all participants reported ease of use with saliva tests, even though, some experienced minor issues. These included having to secure the tube lid properly and not being able to brush their teeth for 30 minutes before taking the samples. However, overall, participants found saliva collection to be feasible and acceptable.

“I had no issues at all with the saliva sample” (P6).

“It was more like making sure you closed it really properly, like closed it properly, so it didn’t spill, or anything like that and yeah, I found them quite good” (P10).

**Instructions.** Almost all participants found the video instructions provided to be helpful in showing them how to perform the test correctly.

“The instruction was very clear, and also the videos of how to collect the samples and how to use the pricking needle that was really helpful” (P7).

One participant mentioned that a user’s preferred method of learning may have an impact on which format of instructions suited them best. They stated that video learning suited their learning style but offering a set of resources through different media might be useful for others.

“...I’m personally more of a video learner so like found that easier than like reading it, I guess it’s nice to give both options cause you don’t know...” (P9).

This point was made by another participant, who mentioned that because of their preferred method of learning, in-person demonstrations would have been a useful form of instruction for them.

“...but I think that’s a lot to do with how I learn as well, that having kind of like someone demonstrate it to me and see maybe how their twisting the mechanism for the lancet or that would’ve probably been helpful...” (P10)

Feasibility of self-tests as a long-term strategy

**Improvements to the process.** While most participants acknowledged that the process was acceptable and feasible overall, many offered suggestions that could be implemented to improve it. Some participants suggested a text message that serves as a reminder of when to conduct the test would be useful to remind participants of the testing regimen.

“I don’t know if it would even be feasible to like send out a text, um like reminders to do your test of the day or something” (P9).

Participants were speaking from experience when recommending this change to the process as they found it was possible to forget to take samples as per the protocol.

“...So, maybe to have like a reminder message sent out... it’s not very hard to keep track of collecting one sample in the morning, I just forgot a few times...” (P6)

Other participants suggested the use of a QR code to access instructions rather than a link printed on paper. Participants suggested that this would make the process of accessing the videos quicker and easier.

“I do like the ideal of like the QR codes and to the video. That would definitely help, but overall, I thought it was a great program” (P9).

**Self-testing compared to healthcare professional administered tests.** Overall, participants agreed that the saliva test was more acceptable than a healthcare professional administered Polymerase Chain Reaction (PCR) test. Participants noted
that someone else performing the swab into the nasal cavity and in the throat was quite invasive and more uncomfortable compared to self-testing via saliva collection and a pin-prick kit.

“...Yeah, I found, um, the ones we had to do with um, this study a lot less invasive than like the nasopharyngeal...” (P9)

One participant stated that they would choose to undergo whichever test was more likely to give an accurate result. They concluded that a professional swabber may perform the procedure more accurately, resulting in a more accurate result.

“...I suppose when someone else does it, and a professional kind of does it, so it seems like it’ll be done, it might be done better...” (P2)

Another participant raised the issue of people potentially tampering with the tests to avoid testing positive. Therefore, the accuracy of a self-test could be questionable.

“...if they were worried because they were starting to feel a little sick, they could have someone else fill in the tubes for them or you know, just fill it with a little bit of water or whatever it is. Just to get around possibly testing positive...” (P6).

Travel experience

Travel from abroad and to accommodation where self-isolating. Participants described mixed experiences of their journey to Ireland where they were subject to restrictions on arrival. Protective measures were put in place for transport. One participant explained that the university provided taxis from the airport to accommodation, and that only those going to the same household could share this transport. Otherwise, the student had to travel alone in a taxi. This was to minimise interaction and thus potential viral spread.

“...and then they had taxi services all lined up for us we all went individually, so each taxi only took you if you were living in the same household, uh, with other people, otherwise you had to go on your own...” (P6)

Another participant explained that when they travelled that everyone had to take a separate taxi even if they were travelling to the same quarantine location. This made participants feel safer with regards to COVID-19 spread as interaction and mixing with others was minimised.

“...Each individual student got their own cab. There were another two people coming to my same address, but all of us got a different cab... it was pretty safe, there was minimal interaction...” (P4).

One participant was being transported by a family member from the airport to their family home where they were self-isolating. They explained that they took numerous measures to prevent spread, including sitting as far away from each other as possible and wearing an FFP2 mask.

“...he was wearing like an FFP2 mask, not the FFP3 but the FFP2 masks and he collected me in my car and he had me sit in like the back seat and like at a diagonal, so I was as far away from him as possible...” (P10)

Restrictions in Ireland compared to other countries. All participants remarked that the restriction of movement or quarantine period in Ireland was less strict, than in other countries where they had completed similar periods. There were several reasons for this, for example, in Ireland, it was permissible to go for small walks outdoors, compared to other countries where travellers were confined to a single room or self-contained isolation area.

“Yeah, I’d say definitely because in [country name], I don’t think we were allowed the small walks and things and that definitely, that quarantine felt a lot harder than this one” (P9).

Additionally, participants stated that rules in Ireland were less strict overall, and this contributed to the restriction of movement period being less isolating compared to other countries.

“...I found the quarantine period in [country name] a lot more isolating than here...” (P9)

Discussion

Statement of key findings

This research, though exploration of participants experiences has found that students felt that self-testing for SARS-CoV-2 is practical and may aid in the public health response to SARS-CoV-2. The self-testing regime was deemed acceptable by most students, the majority of whom felt they demonstrated compliance with the self-tests. Additionally, this study demonstrated high levels of compliance with restriction of movement guidelines and self-testing, with limited impact on general well-being as expressed by students. The qualitative approach allowed the study team to obtain detailed and in-depth accounts of participants’ experiences and opinions of their period of restricted movements and use of SARS-CoV-2 self-test kits21.

Interpretation

Self-testing. The majority of participants found that using self-test kits to identify SARS CoV-2 infection was practical and acceptable. Overall, the performance of the testing procedures was highly accepted among those interviewed and they expressed that they would be willing to undertake self-testing again. This is similar to other studies undertaken in similar populations25,26. Most students expressed a preference for self-tests over a health care professional performed PCR test. However, the accuracy of the result from a professional versus self-testing was an important consideration for some students. Confidence in self-test results and false negatives are worth considering. One study conducted at a university suggested that just under 80% of participants felt confident in their PCR test results24. This is especially important if people will undertake activities or increase their social contacts depending on the test result. The convenience, accuracy, and invasiveness of testing
procedures must be considered to ensure maximum uptake of testing. Overall, self-testing for SARS CoV-2 was found to be useful for detecting the virus in the literature25,26.

Although participants expressed some difficulty with the pin-prick antibody test used to determine prior exposure to COVID-19, most of them noted that after practice, there was no issues with performing the test. Other studies investigating finger-prick tests indicated that the overall useability of these tests was high but some problems associated with use were noted27,28. A minority of participants referred to inconveniences, such as not being able to brush their teeth for 30 minutes prior to conducting the saliva test and other barriers including forgetting to take the test. These barriers were not noted in the literature29. These studies may make use of reminder mechanisms. However, these barriers did not deter participants from undertaking the test. Many participants explained the positive impact that the test result had. This occurred where a negative result left them feeling relieved as they knew they had not contracted COVID-19.

Several students mentioned that video instructions were particularly valuable in demonstrating how to use the tests30. Students also offered some improvements that could be implemented to the instruction process and to the process of the programme overall. Such improvements could be implemented into SARS CoV2-2 testing programmes going forward.

**Compliance with restriction of movement guidelines and impact on wellbeing.** High levels of compliance with restriction of movement guidelines were demonstrated in this study. Most students reported following public health guidelines as much as possible. This is in line with another study, which suggested that those aged between 18–24 years old were the most adherent age group for self-isolating after travel31. However, there were some activities mentioned by participants, which they indicated were essential to be completed. These activities, like shopping could not be completed online, in some cases and increased the participants’ contacts outside of the household. Other participants felt like they missed out on opportunities as they could not attend events or activities in person. A study conducted on a similar population indicated that the availability of social supports to support practicalities like shopping played a role in compliance with self-isolation measures32.

In contrast to other studies, this study suggests that restriction of movement guidelines and isolation periods had a minimal impact on general wellbeing. Other studies have shown that during the COVID-19 pandemic, young people have been particularly at risk for mental health issues33,34. According to the ISWAB study participants, the impact of this particular isolation period did not affect their mental wellbeing negatively for a substantial length of time. Almost all participants of this study noted that although restriction of movement periods in Ireland were easier to follow, as they were not as restrictive in comparison to other countries, there were still some burdens associated with this period, in Ireland. Exercise was mentioned as an important activity by many participants. With some stating that a lack of exercise impacted their wellbeing negatively and conversely, that the ability to undertake exercise positively impacted wellbeing. Studies have found that provision of green spaces and areas to exercise during restricted movements can help to mitigate negative effects on wellbeing33,34. Additionally, restricting movements with other people positively impacted wellbeing, while conversely restricting movements alone was generally associated with poorer wellbeing status. This may be because group isolation might alleviate some of the boredom and loneliness associated with isolation periods35.

For some participants, the restricted movement period fostered a sense of optimism and appreciation for their lives post-isolation. Overall, participants looked forward to completing their restriction of movement period so they could revert to their regular schedule.

**Strengths and limitations**

A limitation of this study was that participants were recruited from one university. Undertaking a multi-site study may provide results that are more nationally representative. Although, the attitudes and experiences discussed by students attending this university are likely to be common across Irish universities. A further limitation of this study is the small sample size (n=11). Selection bias may have occurred leading to the views of those willing to be interviewed being captured. However, consistency was present in the results as data saturation was reached. One strength is that both focus groups and group/one-on-one interviews were held. Firstly, as this study was conducted during the summer period, participants were not on campus, and most returned home overseas, thus different time zones needed to be considered. This approach meant that participants could share their experiences at a time which suited them, which is represented by the mixture of focus groups, group interviews and individual interviews. Secondly, the integration of focus group and interview data acted to enrich the data generated as themes explored broadly in a focus group could be discussed in more depth in a one-to-one interview36. Interviews and focus groups allowed for data triangulation. This process of the convergence of main themes enhances the trustworthiness of study findings36. The interviewer was not known to any participants, which encouraged open and insightful views of the participants’ experiences.

**Further research**

This study contributes to the developing body of research that self-testing for SARS CoV-2 is a useful method of detecting the virus and is practical for at-home use. In further work, it would be important to assess the usability of such tests in populations that differ from the one studied and with other infectious diseases. More research with a larger sample size could examine further the practicality and feasibility of conducting an at-home test. This study demonstrated high levels of compliance with restriction of movement guidelines and with limited impact on general well-being. Further research on levels of compliance during differing levels of restrictions could be useful, in
addition to studies which may examine any impact of restrictions on mental health/wellbeing in more detail.

Conclusions
This study offers a valuable insight into the experiences of university students during a period of restricted movements, their attitudes towards the period of restricted movements, and the acceptability and feasibility of self-testing for SARS-CoV-2. Firstly, this work shows that self-testing for SARS-CoV-2 may play a role in the public health response to the COVID-19 pandemic. This study should inform future self-testing initiatives as it demonstrates that among these participants a self-testing regime is acceptable and feasible for at-home use. Self-testing should be considered for inclusion in planning responses to outbreaks of infectious diseases.

Additionally, this qualitative study demonstrated high levels of compliance with restriction of movement guidelines. This study indicated that restriction of movement periods had a limited impact on general wellbeing. However, the implications and impacts of periods of restricted movements should be the subject of further research. Such research is needed to ensure that appropriate support is provided to university students and other members of the population, especially considering the ongoing nature of the SARS-CoV-2 pandemic.

Data availability
Underlying data

Data are available under the terms of the Creative Commons Zero “No rights reserved” data waiver (CC0 1.0 Public domain dedication).

Author contributions
McGovern M: conceptualization, formal analysis, methodology, Writing – Original Draft Preparation Burton E; conceptualization, formal analysis, methodology, supervision, Writing – Review & Editing. Fanning L; Writing – Review & Editing Killeen G; Writing – Review & Editing O’Sullivan K; Writing – Review & Editing. Video O’Mullane J; Writing – Review & Editing. Video; Fitzgerald AP; Writing – Review & Editing Byrne M; Conceptualization, Writing – Review & Editing Kearney PM; Conceptualization, Writing – Review & Editing. Supervision.

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