Summer 2024

Reducing Wait Times for Psychiatric Intakes

Ryan Brad Carsten
University of South Carolina - Columbia

Reducing Wait Times for Psychiatric Intakes

By

Ryan Brad Carsten

Psychiatric Mental Health Certification

University of South Carolina, 2019

Masters in Nursing, Family Nurse Practitioner

South University, 2015

Submitted in Partial Fulfillment of the Requirements

For the Degree of Doctor of Nursing Practice in

College of Nursing

University of South Carolina

2024

Accepted by:

Dr. Rachel Bush, Committee Chair

Dr. Beverly Baliko, Committee Member

Dr. Emma Griffin, Committee Member

Abstract

Problem Statement: Early intervention for mental illness is vital to a swift recovery and extended wait times for mental health treatment have proven to be a barrier to early intervention. **Purpose:** The purpose of this quality improvement project was to determine if wait times for psychiatry intakes at the University of South Carolina (USC) Student Health Center Psychiatry Services can be reduced and kept under 1 week by utilizing the Specific Timely Appointments for Triage (STAT) model. This model consists of clinicians scheduling a specified number of intake appointments based on the typical demand for service. Students were booked in the earliest possible appointment and bypassed triage as the provider is assuming the role of triage and will be providing interventions as indicated. **Method:** A pre-post study design was used to compare psychiatric intake wait times from past semesters to wait times during the semester that the intervention occurred. **Inclusion Criteria:** All students referred for psychiatry intake and all students presenting to the clinic seeking psychiatry intake were included in the study. **Analysis:** Paired t-tests completed with Intellectus used to evaluate whether the participants experienced a reduction in psychiatry wait times. A cost analysis was conducted to determine the sustainability of the STAT model over time. **Implications for Practice:** Reducing wait times for students seeking psychiatric intake will lead to early interventions, higher satisfaction scores, and overall better outcomes for students seeking psychiatric intake. Another expected outcome of this project is a greater utilization of psychiatric services by students. Once the perceived barrier of waiting for care is removed, more students will likely seek psychiatric services than in previous semesters. Reducing wait times will also lessen the pressure on providers to provide high quality, rapid, and cost-effective interventions for patients in need of mental health treatment.

Keywords: STAT, Student Health Center, wait times.

Reducing Wait Times for Psychiatric Intakes

Early identification of mental illness along with the proper treatment can improve the well-being of those suffering with mental illness (Cacheda et al., 2019). Depression among college students is generally not managed well and only about 50% of those with depression receive treatment (English & Campbell, 2019). In fact, an inability to accommodate new referrals without delay has been named as a reason some college health centers are reluctant to screen for depression and other mental health disorders among their student population more often (English & Campbell, 2019). The Healthy Minds Study included 76,406 survey respondents from various universities found that 41% of respondents had depression and 36% had anxiety. The study also found that 29% had taken psychiatric medications over the previous year (Healthy, 2023). The American College Health Association surveyed colleges across the nation and 55,292 students responded from 125 different institutions. Out of those who responded, 11% reported difficulty finding an appointment as a barrier to seeking mental health treatment. It was also found that 36% of these respondents reported anxiety as a barrier to performing academically and 26.8% reported depression as a barrier to academic performance (American, 2024).

Extended wait times also impact providers. Longer wait times often apply pressure to primary care providers to provide care that may be outside of their scope (Marshall et al., 2023). Longer wait times also leave the specialist providers such as psychiatry feeling burned out as they often feel unable to appropriately care for their patients (Marshall et al., 2023).

Reducing wait times for psychiatric intakes at a major university student health center in South Carolina will allow for earlier treatment of mental health disorders among the student population. Wait times will be reduced by utilizing the Specific Timely Appointments for Triage (STAT) model, a model that calculates how many new appointments per week are required to keep up with demand (Harding, et al., 2020). The key elements of the STAT model are to protect intake appointments, utilize short-term interventions to reduce any backlog of patients waiting on an intake, and adjust schedules to

accommodate demand (Harding, et al., 2020). This could lead to increased utilization of psychiatric services by the student population as studies have found that when adolescents have extended wait times, they are less likely to attend their appointments when they eventually get them (Clark et al., 2018). Studies have also found that facilities are more likely to avoid screening for depression when they do not have the ability to see their patients promptly (English & Campbell, 2019).

Background

Suicide is a leading cause of death among college universities and limited access to mental health care has been named as a risk factor for suicide (Suicide, 2020). According to the (USC) graduate school (2022), out of 226 graduate student survey respondents, 38% rated their mental health as fair or poor while 48% reported accessing mental health services on campus. There are more than 13 million individuals attending four-year colleges in the United States and estimates suggest that mental health problems are responsible for around half of all annual withdrawals (English & Campbell, 2019). Depression has been linked to dropping out of school and is associated with lower grade point averages. When depression is combined with anxiety, grades fall even further (Suicide, 2020). A review of the USC charting system revealed that in 2023, the psychiatry department at USC saw 1,677 new patients (Point and Click, 2024). Most of those patients were experiencing anxiety and the second most common illness treated was depression. It is also not uncommon for the students to have both anxiety and depression. In 2023, the USC had an enrollment of 36,538 and there were 1,677 students seen by the psychiatry department at student health (Point and Click, 2024). This represents 4.6% of the total population at USC. There were 2 full time nurse practitioners, 1 resident psychiatrist, and 1 full time psychiatrist in 2023 and they each had 2 intake spots available for new patients per day except for the resident. The resident often had as many as 4 intakes per day, usually 4 days per week.

During this project, there were 2 full time nurse practitioners. Intake spots are reserved for new patients and are 1 hour long. Students are referred to psychiatry by other departments such as primary

care, counseling services, and women's health. Psychiatry intakes are completed in person and via telepsychiatry. The platform for the intake appointment is determined by patient preference, provider preference, and the type medications indicated. If a student is taking stimulant medication, this requires an in-person appointment prior to initiating medications.

Extended wait times for mental health services have been considered a barrier to individuals seeking and receiving care (Cacheda et al., 2019). Polls have been found that extended wait times are a barrier to seeking mental health care (Iskra et al., 2018). Wait times for someone to receive mental health services varies wildly from facility to facility and it has been found that wait times at some facilities can be as high as 18 months (McMahan et al., 2022). Wait times for initial psychiatric intake appointments at the University of South Carolina Student Health Center (SHS) can sometimes reach 7-14 days (E. Porter, personal communication, May 10, 2023). This could be due to a variety of factors including not enough providers with available intake spots on their schedule. This ongoing issue of extended wait times for mental health services has led to the following clinical question: Can wait times for psychiatry intakes at the University of South Carolina Student Health Center Psychiatry Services be reduced by utilizing the STAT Model?

Literature Search Strategy

Studies that reported interventions that reduced wait times for psychiatric intakes were included in the search. Multiple databases were included in the search and included PubMed, CINAHL, Medline, PsychINFO, PsychiatryOnline, PsycArticles, PsycTESTS, a general search of The University of South Carolina online library. Search terms for this study included "wait times", "interventions wait times", "wait list", "extended wait", "reducing wait times", "new patient", "high demand wait times", "increasing new patient", "long wait", "managing wait times", "managing wait list", "specific timely appointment", and "STAT". Search results were limited to articles less than 5 years old and only included articles written in English.

These searches returned hundreds of articles and they were further narrowed down to only full text articles that explored interventions to reduce wait times in healthcare settings. Fifteen articles were ultimately selected for the evidence table. There were 4 level I articles, 2 level II articles, and 9 level III articles included (see Appendix A).

Literature Review and Synthesis

The articles included in this study support the notion that the STAT model can reduce wait times for services. The STAT model has also proven to be sustainable over a 12-month duration at reducing wait times (Harding et al., 2020). Harding et al. (2020) evaluated 8 sites that implemented the STAT model after previously utilizing a waiting list to manage the demand for their services. It was found that there was a 29% reduction in waiting time across eight sites over a 12-month period. Based on the evidence, the STAT model has the potential to reduce wait times by up to 34% while incurring little to no costs to the organization. The evidence reviewed also suggested that many interventions that address the structure of patient scheduling will reduce wait times (Ansell et al., 2017).). A study by Naiker et al. (2018) found that focusing on operational efficiency had a positive impact on reducing the time patients had to wait on intake appointments. This included focusing on scheduling initiatives like aligning supply to meet demand. Pisharody et al. (2022) conducted a study that evaluated the impact adding additional appointments had at a radiology clinic during busy holiday hours and it was found that adding the additional appointments did correlate with reduced wait times for services. Harding et al. (2016) observed the effects implementing the STAT model had at an outpatient physiotherapy office and it was found that wait times were reduced 22% after implementation of STAT. A study conducted by Harding et al. (2019) found that staff members at facilities where the model had been introduced acknowledged the decrease in wait times and reported feeling more productive. One study attempted to reduce wait times for psychiatry appointments by increasing the number of providers, which can be costly (Naiker et al., 2018). Common themes in the research were patient satisfaction, long wait times for services, patient

satisfaction, and financial costs to the organization. Many approaches utilize systems that require the prioritization of patients based on their acuity level. Other systems utilize a waiting list, and some facilities even have staff hired to manage these waiting lists (Naiker et al., 2018).

The STAT model utilized for this study takes a different approach. Rather than making changes to the staff that are already in place, this model focuses on making changes to the way patients are scheduled.

Theoretical Framework

The Health Promotion Model (HPM) theory was applied to this project. The Health Promotion Model aims to explain factors underlying an individual's motivation to engage in health-promoting behaviors (Nursing Theory, 2023). For this reason, and because perceived extended wait times have been considered a barrier to care, the Health Promotion Model supports utilizing STAT.

The HPM suggests that people actively regulate their own behavior, and ~~they~~ will commit to participate in behaviors that they think will provide them benefit. This model tends to focus on past behaviors and personal factors such as biological, psychological, and socio-cultural as being predictors of future behavior (Nursing Theory, 2023). Long wait times have been a barrier to care in the past for patients with mental illness so hopefully the reduced wait times associated with the implementation of STAT will remove this barrier. If students believe that that they will be seen with reduced wait times, they will likely participate in health promoting behavior in the future.

Based on this information, the purpose of this quality improvement project was to determine if the use of STAT reduces the Student Health Center's psychiatric intake wait times for students at the University of South Carolina compared to the previous method of providers maintaining 2 intakes per day. The description of employing STAT using the Plan-Do-Study-Act (PDSA) model follows.

Methods

Model

The Plan-Do-Study Act (PDSA) Model, a four-stage problem-solving model used for improving a process or carrying out change will be used as the specific implementation steps that will be taken to implement the project intervention (STAT) aligns with the four stages of the PDSA Model (Agency, 2020). A description of this alignment follows:

Plan: This project was carried out with the assistance of a few team members at the University of South Carolina Student Health Center. A case manager, front desk staff, the department supervisor, and 2 psychiatric nurse practitioners were involved. The case manager assisted with gathering data regarding wait times during previous semesters. The front desk staff was involved in the day-to-day scheduling of patients for psychiatric intakes. The department supervisor agreed to allow the provider**s'** schedules to be altered to accommodate more intake appointments as needed based on the demand for services. All students seeking an intake with psychiatry were also included. The wait times of patients each week were assessed every Friday by one of the two providers. These wait times were compared to the previous year. This information was used to determine when an extra intake needed to be added and to assess if the project was successful or not.

Do: Wait times for psychiatry intakes were monitored and it was determined when wait times were the greatest during the semester in the prior two years. When wait times exceeded one week, the two full time providers each had one extra intake spot added to their schedule each day. This equaled 10 extra intake appointments per week to accommodate the higher demand. If the wait time exceeded one week at any time after the one extra intake spot was added to the provider's schedule, one additional spot was added to each provider's schedule, providing a total of 20 extra intake spots per week to accommodate the increase in demand. Additional intake spots were limited to a maximum of four per day on each provider's schedule to reduce the potential for provider burnout. The current standard is

two intake spots on each provider's schedule per day. Providers in this setting do have the autonomy to make changes to their schedule as necessary.

Study: After the semester, wait times were analyzed by the provider implementing the project to determine if there was a substantial reduction in wait times for psychiatric services. **Act:** The results of the project were discussed with the department supervisor to determine if implementing this method is conceivable on a full-time basis.

Measure/Tools

The primary outcome measure was wait times measured in days for psychiatry intake appointments measured in days? This was measured by comparing the mean wait times for each week to the mean wait times for the same week in the previous year. The wait times were recorded each Friday by one of the providers participating in the study. This was done across the entirety of the spring 2024.

Data Monitoring

There were not any specific participants recruited. This project involved collecting retrospective data regarding wait times for psychiatric intake appointments and data regarding wait times after implementation of the STAT method. No personal patient identifiable information was obtained or stored. This project was submitted for review and determined to be exempt by the Institutional Review Board.

Data Analysis

Intellectus was utilized to compare the data with *t*-tests for the continuous data of wait times. The data collected was compared to the original data gathered from the spring 2023 semester to determine if there was a decrease in wait times throughout the semester.

Expected Outcomes

The benefit of this project to the patients is that they will see reduced wait times for the initial psychiatry intake appointments at the Student Health Center at USC. The patients also stand to benefit because they will not have to wait as long for their appointments. A decrease in wait times and a reduction in the number of patients waiting to be seen will take some of the stress off the providers.

Results

There were 248 intakes completed from 01/05/2024 – 04/07/2024 compared to 298 from 01/05/2023 – 04/07/2023. There were 2 providers available during the study in Spring 2024 compared to 4 available during Spring 2023.

A two-tailed paired samples *t*-test was conducted using Intellectus to examine whether the mean difference of wait times in Spring 2023 and wait times in Spring 2024 was significantly different from zero.

The result of the two-tailed paired samples *t*-test was not significant based on an alpha value of .05, $t(13) = -0.81$, p - .434, indicating the null hypothesis cannot be rejected. This finding suggests the difference in the mean of wait times in Spring 2023 and wait times in Spring 2024 was not significantly different from zero. The results are presented in Table 1. A bar plot of the means is presented in Figure 1.

Normality. A Shapiro-Wilk test was conducted to determine whether the differences in wait times in Spring 2023 and wait times in Spring 2024 could have been produced by a normal distribution. The results of the Shapiro-Wilk test were not significant based on an alpha value of .05, $W = 0.90$, p = .117. This result suggests the possibility that the differences in wait times in Spring 2023 and wait times in Spring 2024 were produced by a normal distribution cannot be ruled out, indicating the normality assumption is met.

Table 1

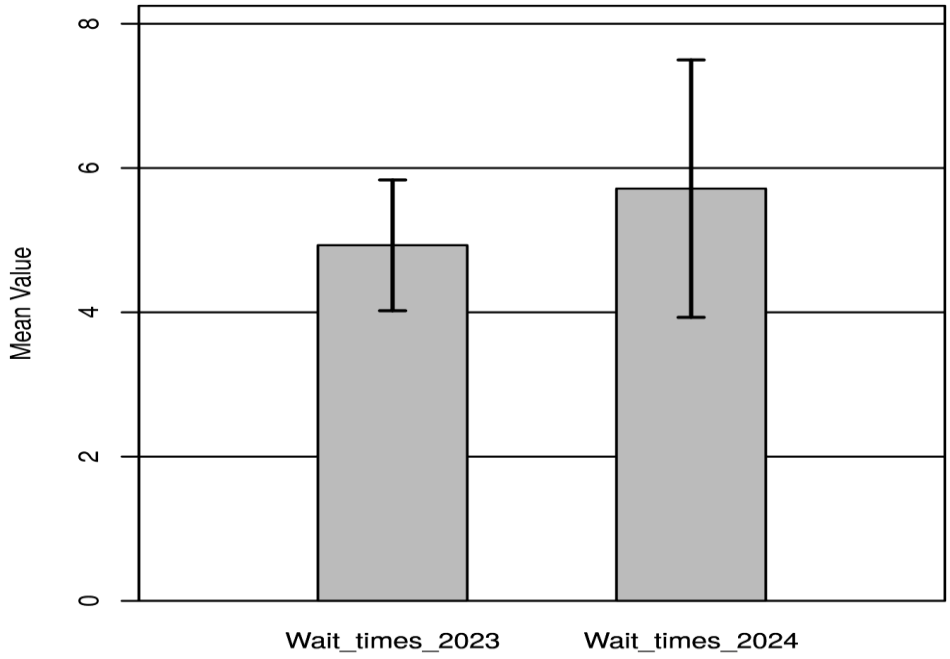
Two-Tailed Paired Samples t-Test for the Difference Between Wait_times_2023 and Waittimes_2024

Wait_times_2023		Wait_times_2024				
M	*SD*	*M*	*SD*	*t*	*p*	*d*
4.93	1.73	5.71	3.41	-0.81	.434	0.22

Note. N = 14. Degrees of Freedom for the *t*-statistic = 13. *d* represents Cohen's *d*.

Figure 1

The means of Wait_times_2023 and Waitimes_2024 with 95.00% CI Error Bars



Wait times:

01/06/2023 – 3 days	01/05/2024 – 6 days
01/13/2023 – 4 days	01/12/2024 – 4 days
01/20/2023 – 1 day	01/19/2024 – 2 days
01/27/2023 – 4 days	01/26/2024 – 6 days
02/03/2023 – 7 days	02/02/2024 – 8 days – added 3rd intake spot
02/10/2023 – 5 days	02/09/2024 – 6 days
02/17/2023 – 8 days	02/16/2024 – 4 days
02/24/2023 – 6 days	02/23/2024 – 3 days
03/03/2023 – 4 days	03/01/2024 – 7 days

03/10/2023 – 6 days	03/08/2024 – 1 day
03/17/2023 – 5 days	03/15/2024 – 6 days
03/24/2023 – 5 days	03/22/2024 – 4 days
03/31/2023 – 6 days	03/29/2024 – 8 days
04/07/2023 – 5 days	04/04/2024 – 15 days

Discussion

Implementation of the STAT model successfully added flexibility to the Student Health Center providers' schedules. When planning this project, the primary focus was on reducing wait times. While eliminating wait times is important in the mental health setting, it is also important to provide timely mental health care to individuals who may be in need and the STAT model did show potential to improve workflow. Adding the 3rd intake spot during the 5th week of the study allowed the wait times for new patient intakes to reduce back below 1 week after week 5 and remain under 1 week for most of the project's duration. In the interim between the previous year and project implementation, administrative changes in the Student Health Center resulted in a reduction of available providers to see patients for intake and follow-up. During the Spring 2023, there were 3 full time providers and a resident provider that changed each month. The resident providers usually were scheduled with 3-4 new patient intakes per day, 4 days per week. Use of the STAT model allowed the two remaining providers to complete 83% of the number of intakes previously completed by all providers. There were not any types of intakes that were not able to be accommodated due to the reduction in available providers. Adding the extra spot for new patients increased each provider's number of available intakes by 50%. The potential to see a comparable number of new patients with fewer staff is an option that can be utilized as a cost-effective method to ensure as many new patients are treated for their mental illness without having to invest in hiring more providers. It can be assumed that if there had been 4 providers available when the study was conducted, wait times would have remained under 7 days. Although the results were not statistically significant, the project can be considered a clinical success due to the fact that nearly the same amount

of intakes were completed compared to the previous year when twice the providers were available. The way new patients are scheduled and the platforms they can utilize to be seen did not change from Spring 2023 through the duration of this project. This allows for the assumption that the STAT model is responsible for the increased productivity of the 2 providers.

A limitation of this model in this setting is that as the provider caseload grows with new intakes completed, space is eliminated for follow ups to be scheduled. Towards the final weeks of the study, the wait times for intakes exceeded 7 days, but there were no available time spots on either provider's schedule to add a 4th intake spot. This could partly be due to this being a unique environment regarding how students are scheduled for follow-up. Many students are required to have their follow-up appointments prior to going home for summer or winter break. Follow up appointments are often every month while titrating medications and then usually every 3 months for medication maintenance. Their 3-month follow-up appointments often fall during the summer months when they are out of the state and unable to be seen for follow-up. This creates an influx of follow ups scheduled in the last couple of weeks of school, often over new patient intake spots. It Is not uncommon for the follow up patients to have priority at the end of the semester because they must be seen to be provided refills.

The STAT model is sustainable over time. From an economic perspective, the STAT model will incur little to no extra costs for the university. Someone is needed to monitor new patient wait times weekly to determine when the extra new patient intake spots would need to be added. This would likely need to be a case manager as the providers do not often monitor wait times. For this setting, 3 intakes per day total would likely be the maximum due to the buildup of follow ups towards the end of the semester that need to be seen. Sustainability would also require buy-in from providers involved. The current providers were impressed with the STAT model's ability to increase productivity while simultaneously having some concerns regarding scheduling follow-up appointments towards the end of the semester. New providers who are hired would need to be made aware that their schedules will be

fluid and need to accommodate the supply and demand of intake appointment requests. As trends are noted regarding when wait times typically increase, the STAT model could be implemented to allow an extra intake spot to be added to provider schedules to avoid any backlog of new patients waiting to be seen. During peak times like the Spring semester, it is uncommon for any intake spots not to be filled quickly by new patients. If there is an open intake spot, it is often used for patients who call in and need to be seen the same day. As scheduling is handled by front desk staff, awareness of flexible scheduling would also be a consideration in training new staff.

Conclusion

Implementation of the STAT model allowed wait times to remain under 7 days for the majority of the project duration and allowed 83% of the same number of intakes to be completed even with half of the number of providers available. Implementing this model should be considered an option going forward at the University of South Carolina Student Health Center to deliver cost-effective mental health care to as many students in need as possible.

References

Agency for Healthcare Research and Quality. (2020 September). *Plan Do Study Act.* https://www.ahrq.gov/health-literacy/improve/precautions/tool2b.html

American College Health Association. (2024 April). *National College Health Assessment. https://www.acha.org/documents/ncha/NCHA-III_SPRING_2023_UNDERGRAD_REFERENCE_GROUP_EXECUTIVE_SUMMARY.pdf*

Ansell, D., Crispo, J., Simard, B., & Bjerre, L. (2017). Interventions to reduce wait times for primary care appointments: a systematic review. *BMC Health Services Research. 17*. https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-017-2219-y

Cacheda, D., Novoa, J., & Carneiro, V. (2019). Early detection of depression: social network analysis and random forest techniques. Journal of Medical Internet Research, 21(6), e12554–e12554. https://doi.org/10.2196/1255

Clark, S., Emberly, D., Pajer, K., Delong, E., McWilliam, S., Bagnell, A., Abidi, S., Casey, B., & Gardner, W. (2018). Improving access to child and adolescent mental health care: the choice and partnership approach. *Journal of the Canadian Academy of Child and Adolescent Psychiatry, 27*(1), 5–14.

English, B., & Campbell, D. G. (2019). Prevalence and characteristics of universal depression screening in U.S. college health centers. *Families Systems & Health, 37*(2), 131-149. https://doi.org/10.1037/fsh0000411

Handy Asim, Mangal Rohan, Stead, T. S., Lane, C. R., & Ganti Latha. (2022). Prevalence and impact of diagnosed and undiagnosed depression in the United States. (8), e28011–28011. https://doi.org/10.7759/cureus.28011

Harding, K., & Bottrell, J. (2016). Specific timely appointments for triage reduced waiting lists in an outpatient physiotherapy service. *Physiotherapy 102*(4), 345-350. https://doi.org/10.1016/j.physio.2015.10.011

Harding, K., Camden, C., Lewis, A., Perreault, K., & Taylor, N. (2022). Service redesign interventions to reduce waiting time for paediatric rehabilitation and therapy services: a systematic review of the literature. *Health & Social Care in the Community, 30*(6), 2057-2070**.** https://doi.org/10.1111/hsc.13866

Harding, K., Leggat, S., Watts, J., Kent, B., Prendergast, L., Kotis, M., O'Reilly, M., Karimi, L., Lewis, A., Snowdon, D., & Taylor, N. (2018). A model of access combining triage with initial management reduced waiting time for community outpatient services: a stepped wedge cluster randomized controlled trial. *BMC Medicine 16,* 182. https://doi.org/10.1186/s12916-018-1170-z

Harding, K., Lewis, A., Snowdon, D., Kent, B., & Taylor, N. (2021). A multi-faceted strategy for evidence translation reduces healthcare waiting time: a mixed methods study using the RE-AIM framework. *Frontiers Rehabilitation Sciences.* doi: 10.3389/fresc.2021.638602

Harding, K., Snowdon, D., Lewis, K., Leggat, S., Kent, B., Watts, J., & Taylor, N. (2019). Staff perspectives of a model of access and triage for reducing waiting time in ambulatory services: a qualitative study. *BMC Health Serv Res 19,* 283. https://doi.org/10.1186/s12913-019-4123-0

Harding, K., Snowdon, D., Prendergast, L., Lewis, A., Kent, B., Leggat, S., & Taylor, N. (2020). Sustainable waiting time reductions after introducing the STAT model for access and

triage: 12-month follow up of a stepped wedge cluster randomised controlled trial. *BMC Health Serv Res 20,* 968. https://doi.org/10.1186/s12913-020-05824-z

Harding, K., Watts, J., Karimi, L., O'Reilly, M., Kotis, M., Leggat, S., Kearney, J., & Taylor, N. (2016). Improving access for community health and sub-acute outpatient services: protocol for a stepped wedge cluster randomised control trial. *BMC Health Services Research 364.* https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-016-1611-3

Healthy Minds Network. (2023). *The Healthy Minds Study. https://healthymindsnetwork.org/wp-content/uploads/2023/08/HMS_National-Report-2022-2023_full.pdf*

Iskra, W., Deane, F., & Davis, E. (2018). Parental perceptions of barriers to mental health services for young people. Early Intervention in Psychiatry. 12, 125-134. doi:10.1111/eip.12281

Johannessen, K. A., & Alexandersen, N. (2018). Improving accessibility for outpatients in specialist clinics: reducing long waiting times and waiting lists with a simple analytic approach. *BMC Health Services Research*, *18*(1). https://link.gale.com/apps/doc/A567963334/PPNU?u=colu68650&sid=bookmark-PPNU&xid=c984ba75

Marshall, E. G., Miller, L., & Moritz, L. R. (2023). Challenges and impacts from wait times for specialist care identified by primary care providers: Results from the MAAP study cross-sectional survey. *Healthcare management forum*, *36*(5), 340–346. https://doi.org/10.1177/08404704231182671

McMahan, K., Martin, K., Greenfield, M., Hay, P., Redwine, M., Fargason, R., & Lokken, K. (2022). Using a tele-behavioral health rapid intake model to address high demand for psychotherapy at an

academic medical center during COVID-19. Frontiers in Psychiatry. 13, https://doi.org/10.3389/fpsyt.2022.989838

Naiker, U., FitzGerald, G., Dulhunty, J., & Rosemann, M. (2018). Time to wait: a systematic review of strategies that affect out-patient waiting times. *Australian Health Review, 42*, 286-293. http://dx.doi.org/10.1071/AH16275

NURSING THEORY. (n.d.). PENDER'S HEALTH PROMOTION MODEL. https://nursing-theory.org/theories-and-models/pender-health-promotion-model.php

Pisharody, V., Yarmohammadi, H., Ziv, E., Sotirchos, V., Alexander, E., Sofocleous, C., & Erinjeri, J. (2023). Reducing wait times for radiology exams around holiday periods: a monte carlo simulation. *J Digit Imaging 36*, 29–37. https://doi.org/10.1007/s10278-022-00728-2

Point and Click. (2024). Provider Visit Records. https://ushsapps.ushs.sc.edu/Account/Login

Rathnayake, D., & Clarke, M. (2021). The effectiveness of different patient referral systems to shorten waiting times for elective surgeries: systematic review. *BMC Health Services Research*, *21*(1), NA. https://link.gale.com/apps/doc/A653612526/PPNU?u=colu68650&sid=bookmark-PPNU&xid=08dde128

Raymond, H., Demers, L., & Feldman, E. (2016). Waiting list management practices for home-care occupational therapy in the province of Quebec, Canada. *Health & social care in the community*, *24*(2), 154–164. https://doi.org/10.1111/hsc.12195

Snowdon, D., Harding, K., Taylor, N., Leggat, S., Kent, B., Lewis, A., & Watts, J. (2020). Return on investment of a model of access combining triage with initial management: an economic analysis. *BMJ Journals 11*(7). https://bmjopen.bmj.com/content/11/7/e045096

Suicide Prevention Resource Center. (2020). *Consequences of Student Mental Health Issues.* https://sprc.org/settings/colleges-and-universities/consequences-of-student-mental-health-issues/#:~:text=Research%20suggests%20that%20depression%20is,anxiety%20can%20increase%20this%20association.&text=Depression%20has%20also%20been%20linked%20to%20dropping%20out%20of%20school.&text=Many%20college%20students%20report%20that%20mental%20health%20difficulties%20interfere%20with%20their%20studies.

University of South Carolina Graduate School. (2022). *Graduate Student Mental Health.* *https://www.sc.edu/study/colleges_schools/graduate_school/about_us/news/2019/graduate-student-mental-health.php*

Appendix A

Will a reduction in wait times for psychiatry intake appointments occur at The University of South Carolina Student Health Center by adding more than the standard 2 intake spots on a psychiatric provider's schedule during periods of high demand?

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 1: Harding et al., 2020 Sustainable waiting time reductions after introducing the STAT model for access and triage: 12-month follow up of a stepped wedge cluster randomised controlled trial. Evidence Level: 1 Quality: High	Randomized controlled trial	8 community-based outpatient sites in Australia. Data was collected on 1,252 pre intervention and 3,106 post intervention.	To evaluate the effectiveness of utilizing the Specific Timely Appointments for Triage (STAT) model in an attempt to reduce wait times for appointments.	Strengths - Can be applied to outpatient healthcare settings. Accurately measured what they stated. Weaknesses - Unknown if the results are sustainable over an extended period of time.	There was a 29% reduction in wait times for appointments over the 12 month follow up period that was attributable to the intervention.	Wait times for appointments, STAT model

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 2: Harding et al., 2018. A model of access combining triage with initial management reduced waiting time for community outpatient services; a stepped wedge cluster randomised controlled trial. Evidence Level: I Quality: High	Randomized controlled trial	Data collected from 3,113 participants. 1,252 pre intervention, 1,861 post intervention.Data collected from 8 sites over 12 month period.	To evaluate the effectiveness of the STAT model in reducing wait times in outpatient settings.	Strengths - This model can be used at many outpatient settings. The use of multiple sites. Weaknesses - Does not provide evidence that the intervention is sustainable over time.	Waiting times for appointment was reduced by 34%	Waiting times for appointments, STAT model
Article 3: Harding er al., 2016. Specific timely appointments for triage reduced waiting lists in an outpatient physiotherapy service. Evidence level: I Quality: High	Observational study comparing retrospective data for 11 months prior to the introduction of the STAT model compared with 11 months of data after introduction.	721 patients referred to a physiotherapy outpatient department.	Explore the effectiveness of STAT model at reducing wait times for initial services.	Strengths - Adequate sample size. Weakness – A provider was absent for a portion of the pre intervention monitoring.	Waiting times for services was 22% lower in the year after the introduction of STAT model.	Waiting time for medical services.

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 4: Harding et al., 2016. Improving access for community health and sub-acute outpatient services: protocol for a stepped wedge cluster randomised controlled trial. Evidence Level: I Quality: High	Randomized controlled trial	Patients referred to 8 different outpatient clinics over the course of 1 year before and after implementation of STAT	Outline the study protocol for a randomized controlled trial to establish the effectiveness of the STAT model at reducing wait times.	Strengths – Adequately lays out the process to determine if STAT is effective. Weaknesses – Does not take into account the possibility of provider absence.	The proposed study will demonstrate effectiveness of STAT model.	Wait times for services and costs associated with wait times.
Article 5: Snowdon et al., 2021. Return on investment of a model of access combining triage with initial management: an economic analysis. Evidence Level: II Quality: High	Prospective pre-post design.	557 adults and children referred to 8 different community outpatient clinics in Australia.	To evaluate the wait times for services and cost effectiveness of the STAT model.	Strength – diverse sample Weaknesses – limited to economic evaluation from a health service perspective	29% reduction in wait times with minimal costs to the health provider.	Wait times, costs to health care provider.

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 6: Harding et al., 2019. Staff perspectives of a model of access and triage for reducing waiting time in ambulatory services: a qualitative study. Evidence Level: II Quality: Good	Qualitative study design was used following an interpretive description approach	20 participants recruited from a large metropolitan health service	To explore the experiences of staff who were involved in the implementation of the STAT model	Strengths – Provided valuable info regarding staff views of STAT Weakness – small sample size	13 participants recommended the STAT model 7 had concerns including concerns regarding long term sustainability of model	Staff perceptions of STAT model
Article 7: Naiker et al., 2018. Time to wait: a systematic review of strategies that affect out-patient waiting times. Evidence Level: III Quality: Good	Systematic review of level 1, 3, and 4 articles.	38 articles consisting of 26 approaches to reduce wait times in outpatient clinics.	Explore mothods to reduce wait times.	Strengths – Large variance among outpatient settings. Weaknesses – Studies do not take into account impact of other factors influencing wait times including provider absences.	Operational effeciency including aligning supply and demand was found to be effective. As demand increased, allocation of appointment slots accommodated this.	Reducing wait times and strategies to reduce wait times

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 8: Harding et al., 2022. Service redesign interventions to reduce waiting time for pediatric rehabilitation and therapy services: A systematic review of the literature. Evidence Level: III Quality: Good	Systematic review of Literature	33 articles evaluating effectiveness of strategies intended to reduce wait times.	Review the effectiveness of redesign interventions on reducing waiting times for services	Strengths – large sample size Weaknesses – risk for bias in many of the reviewed studies	Waiting times were reduced in all studies including those where systemic changes were made.	Reducing wait times for services in outpatient settings.
Article 9: Harding et al., 2021. A Multi-Faceted Strategy for Evidence Translation Reduces Healthcare Waiting Time: A Mixed Methods Study Using the RE-AIM Framework. Evidence Level: III Quality: Good	Mixed methods study	73 respondents to a survey regarding their utilization of STAT	To evaluate the effectiveness of STAT among outpatient providers.	Strengths – Nonbiased respondents Weaknesses – low response rate to surveys	STAT did significantly reduce wait times for triages	Wait times for triage

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 10: Ansell et al., 2017. Interventions to reduce wait times for primary care appointments. Evidence Level: III Quality: Good	Systematic review	11 studies reviewed that assessed different interventions for reducing wait times for primary care appointments.	To determine which interventions reduced wait times for primary care appointments.	Strengths – studies did support interventions to reduce wait times Weaknesses – Lack of variety among different interventions	All interventions assessed did reduce wait times for primary care appointments. Mean wait time reduction was 11 days.	Reducing wait times for primary care appointments
Article 11: Rathnyake et al., 2021. The effectiveness of different patient referral systems to shorten waiting times for elective surgeries: systematic review. Evidence Level: III Quality: Good	Systematic Review	9 articles exploring interventions to reduce wait times for elective surgeries of adult patients.	To investigate if interventions utilized to reduce wait times were effective or not.	Strengths – Study provides data that answers the research question. Weaknesses – only provides data regarding elective surgeries	Using structured referral guidelines does reduce the wait times for elective surgeries.	Reducing wait times for surgeries.

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 12: Johannessen et al., 2018. Improving accessibility for outpatients in specialist clinics: reducing long waiting times and waiting lists with a simple analytic approach Evidence Level: III Quality: Good	Systematic review	Assess wait times 12 months before and 6 months after interventions at 12 clinics in Norway of various specialties.	To evaluate different methods for reducing wait times in outpatient clinics.	Strengths – Large sample size across various clinics. Weaknesses – Resistance from physicians during interventions.	Wait times can be reduced by utilizing structured scheduling practices.	Reducing wait times.
Article 13: Clark et al., 2018. Improving Access to Child and Adolescent Mental Health Care: The Choice and Partnership Approach Evidence Level: III Quality: Good	Systematic review	Pre and post intervention at a children's hospital. 154 charts reviewed before the intervention and 794 after the intervention.	To explore the effectiveness of interventions to reduce wait times.	Strengths – Study found evidence to support the proposed intervention. Weaknesses – Significantly more post interventions charts evaluated. Cannot compare all pre intervention charts to post intervention charts.	Implementation of intervention significantly improved mental health care access by reducing wait times from referral to first visit for outpatient services.	Reducing wait times for outpatient services.

Brief reference (author, date, title) Evidence Level & Quality	Design (descriptive, systematic review, observational, etc.)	Size, Population, & Setting	Purpose, Objective, & Outcome	Strengths / Weaknesses	Results, Conclusions, or Key Findings (that answer your clinical question)	Themes (for synthesis)
Article 14: Raymond et al., 2016. Waiting list management practices for home-care occupational therapy in the province of Quebec, Canada. Evidence Level: III Quality: Good	Cross sectional study	55 respondents who managed wait list healthcare offices in a variety of urban and rural settings.	To evaluate methods used by various offices to manage wait times.	Strengths – high response rate of those surveyed. Weaknesses – Did not examine specific interventions in detail.	Practices that used structured strategies to manage wait times were more effective at reducing wait times.	Wait times and approaches to manage wait times.
Article 15: Pisharody et al., 2023.Reducing wait times for radiology exams around holiday periods. Evidence level: III Quality: Good	Randomized controlled trial	Patients receiving radiology imaging studies around holidays.	To examine if adjusting scheduling techniques could reduce wait times for radiology studies.	Strengths – Studies compared a variety of different scheduling strategies. Weaknesses – Studies did not take into account different types of radiology exams.	Wait times for new patients can be reduced by holding more spots for new patients during busier periods such as holidays.	Reducing wait times for new patient exams.