

The Interplay of Care and Competence in Improving Outcomes during Nursing Interventions

Taea Hartwell, Ray Henwood

Abstract

Background: In the hospital setting RNs fulfill a vital role in patient safety by monitoring patients for signs of physical decline. RNs must monitor patients and react to a sudden deterioration that could be life threatening. Hospitals are required to have systems to summon assistance to the bedside from a Rapid Response Team (RRT). The RRT goal is to prevent failure to rescue. Outcomes from RRTs are highly variable and do not always show an impact on mortality rates. RNs do not always activate the RRT when they should. Some RNs activate the RRT more frequently than others. An increase in the frequency of RRT calls has lowered patient mortality rates.

Objective: To determine if RNs with higher levels of skill in recognition of patient deterioration activate the RRT more frequently. The instrument used to measure this is tied to caring and knowing the patient. **Methodology:** A descriptive, cross sectional, correlational quantitative design was used. RNs (n=166) in acute care who had activated an RRT in the past year completed the Manifestations of Early Recognition (MER) instrument. RRT calls were self-reported.

Results: There was a significant ($p = .0120$) positive correlation ($r = .402$) between the score on the MER and number of RRT calls.

Conclusions: The MER is based on the concepts of knowing and caring. The connection between caring, knowing and preventing failure to rescue is seen as the caring stance of the RN combined with Carper's ways of knowing. These combine to allow a RN with this worldview to detect patient deterioration and act to rescue the patient by calling the RRT and avoiding FTR.

Keywords: Rapid Response Teams, Failure to Rescue, Knowing, Caring

Introduction

Registered Nurse's Role in Patient Safety: According to the Agency for Healthcare Research (AHRQ Patient Safety Net, 2021) in acute care organizations registered nurses (RNs) fulfill a vital role in patient safety by monitoring patients for physical decline. It is stated that RNs act as "an around the clock surveillance system in hospitals for the early detection and prompt intervention when patients' conditions deteriorate." Once a RN decides that their patient is declining there needs to be a reaction to save the life of that patient.

Obtaining Additional Assistance for Patients in Severe Clinical Deterioration: Hospitals accredited by the Joint Commission are required to have a "method that enables health care staff members to directly request additional assistance from a specially trained individual(s) when the patient's condition appears to be worsening" (The Joint Commission, 2008). Most acute care

organizations utilize Rapid Response Teams (RRTs) to meet The Joint Commission's requirement that RNs be able request additional assistance for declining patients. RRTs purpose is to bring critical care expertise to the bedside and prevent further deterioration that might lead to critical events like respiratory failure, sepsis, and cardiopulmonary arrest (Hourihan et al., 1995). RRTs are composed of an ICU RNs and a respiratory therapist. A physician or APRN may or may not be part of the team.

The Purpose of a RRT: The purpose of the RRT is to intervene and prevent failure to rescue (FTR). FTR is defined as the "clinician's inability to save a hospitalized patient's life when he experiences a complication (a condition not present on admission)" (Clarke & Aiken, 2003, p. 42). FTR happens when the hospitalized patient needs a higher level of care than the level of care being provided. Patients who experience a lower level of care than required can experience a rapid clinical deterioration. That deterioration, if left untreated, can lead to poor outcomes. Bellomo et al. (2004), have listed these poor outcomes as: acute myocardial infarction, pulmonary emboli, respiratory failure, stroke, severe sepsis, acute renal failure, and emergency admission to ICU, cardiopulmonary arrest and ultimately death. The RN typically uses specific objective criteria to make a decision to activate the RRT such as: trouble breathing, low oxygen saturation, hypo/ hypertension, cardiac dysrhythmia, chest pain, seizures, change in LOC, signs of stroke, uncontrolled pain, uncontrolled bleeding, and decreased urine output. There is also a subjective criterion for activation of the RRT. The subjective criteria to activate the RRT is that the staff is seriously concerned or worried about the patient.

Background

Impact of RRT on Patient Outcomes: A systematic review of outcomes of patients who had a RRT called on their behalf reported that

"Patients reviewed by rapid response teams have a high and variable mortality rate, and limitations of care are commonly used. Data on the long-term outcomes of RRT are lacking and needed." (Tirkkonen et al., 2017 p. 42). Another study looking out the impact of RRT on mortality rates in 56 hospitals over four years found that "Among a large and diverse sample of US hospitals, we did not find implementation of rapid response teams to be associated with reduction in hospital mortality." (Saket et al., 2022, p.116)

Possible Rationale for Lack of Impact of RRT on Patient Mortality: This is the connection between caring, knowing, and failure to rescue. RNs may not be establishing a caring relationship with their patients due to a lack of time and overloaded patient assignments due to nursing workforce shortage. The workforce shortage has forced healthcare organizations to increase the number of patients each RN cares for. Thus, the nursing workforce shortage impacts staffing, and staffing impacts the number of patients a nurse has to care for. When more patients are assigned to a nurse to care for negative impacts on patient outcomes can occur (American Association of Colleges of Nursing, 2022)

We have more patients than ever and not enough RNs to care for them. The American Nurses Association (ANA) considers this situation a nursing staffing crisis (ANA, ND). This results in less time each nurse spends with their patients, which is measured by RN hours per patient day. The staffing shortage is decreasing RN hours per patient day and negatively impacting patient safety (Rosenberg, 2019). Increases in RN hours per patient day correlate to decrease in patient mortality. In a large study of 1958 Hospital and 702,140 patients Cimiotti et al. (2022) found that increasing RN hours per patient day resulted in a 3% decrease in patient mortality. Thus, the nursing shortage has caused nurses workload to increase and thus decrease RN hours per patient day increasing the risks of a negative outcome, like FTR.

The Connection Between Caring and Early Recognition of Problems

There are many different definitions of caring found in the literature. In Mayeroff's (1971) seminal book, *On Caring*, he identifies the major ingredients of caring. The first item on his list of major ingredients of caring is knowing. Mayeroff states, "in order to care I must understand the other's needs and I must be able to respond properly to them" (1971, p.19). According to Mayeroff, understanding someone is a form of knowing. Mayeroff contends that to care for someone you need to know "who the other is" (1971, p.19). This type of knowing may be connected to the RNs skill in the early detection of patient decline should be reflected in a subjects score on the instrument use to measure early recognition of patient decline. Caring and knowing have been linked to the early recognition of patient problems in research studies (Minick, 1995; Parker, Minick, and Kee, 1999; Minick and Harvey, 2003;).

In the research study "The power of human caring" Minick and Harvey (2003) reached the conclusion that RNs who practice with a caring philosophy can have a greater ability to recognize patient deterioration than nurses who do not have a caring stance. Minick observed that there was an association between knowing the patient and caring about the patient that increase nurse patient engagement and increased nurses perceptions, enhancing assessment skills and helping the RN identify the early signs of clinical deterioration and acting to prevent FTR.

The concept of knowing the patient is an important notion highlighted by Carper's ways of knowing (Carper, 1978). Carper stated that there are four ways of knowing in nursing; empirical knowing, esthetic knowing, personal knowing, and ethical knowing. Personal and empirical knowing are required to detect the subtle changes in the patient that occur in early deterioration. Minick (1995) noted that nurses must have an ethical commitment to their patients in order to be effective in the early

recognition of patient problems (Minick, 2003). This would indicate that the RN must have ethical knowing as described by Carper (1978) to possess a high level of skill in the early recognition of patient problems. RNs who have the skill and time to come to know their patients and practice with a caring stance, should have a higher level of skill in the early recognition of patient deterioration.

Data from research studies show that some nurses decide to activate the RRT sooner than other nurses do (Hillman et al., 2005; Downey et al., 2009). Other literature provides evidence that nurses can fail to recognize the need for the RRT or delay activation of the RRT (Nurmi, et. Al., 2005; Jones et al., 2006; Beaumont, 2008; Quach et al., 2008; Spearpoint, 2008; Calzavacca et al., 2010;). A finding of these studies is that delayed activation or failing to activate the RRT can increase patient mortality and contribute to FTR.

Research Questions and Hypothesis: The research question tested in this study was do RNs who possess higher levels of skill at early recognition of psychological deterioration activate the RRT more frequently than RNs with lower levels? This skill for the purpose of this study is defined as the ability to recognize the early signs of clinical deterioration and intervene to prevent FTR by activation of the RRT. This skill would be reflected by an increased frequency of RRT activation. The research hypothesis is that nurses with higher levels of skill at early recognition of physiological deterioration activate the RRT more frequently. A quantitative instrument was used to measure skill at early recognition of physiological deterioration. The instrument is tied to knowing and caring theory. Subjects self-reported the number of times they called a RRT in the preceding year.

Methodology: A descriptive, cross sectional, correlational quantitative design was used for this study. IRB approval was obtained prior to data collection. Subjects provided their consent before data collection occurred.

Sample: Data was collected from RNs who worked in five different acute care hospitals that had a RRT. Inclusion criteria included 12 months full time employment at the organization on any inpatient unit. Subjects (n=166) must have called a RRT for their patient in the preceding year at least once.

Sample size was determined by power analysis based on Cohen's (1987) method and was performed with the G*Power 3 software program (Franz et al., 2007). Alpha was set at 0.05. To achieve a power of 0.8, with an effect size of 0.3 the power analysis found that a sample size of 160 would be adequate.

Study Setting and Recruitment: Hospitals (n=5) ranged from 283 beds to 400 beds, and all were level 2 trauma centers. Three were non-profit and two were for-profit organizations. RNs were recruited in person at monthly unit meetings (n=51) as well as by online survey (n=146). Flyers were posted in the RNs break rooms to recruit for subjects to complete online survey.

Instrumentation: The Manifestations of Early Recognition (MER) instrument (Minick, 2003) was utilized to measure the RNs skill at early recognition of physiological deterioration. The MER is a valid and reliable instrument that has been used to study RNs. The MER is a self-report, 16 item instrument with a five-point Likert scale with 1= strongly disagree to 5= strongly agree. There are no subscales contained in the MER. According to Minick, "The higher the score the higher the degree of the manifestations of early recognition" (Minick, 2003, p. 298). Reliability and validity of the MER have been demonstrated in research on RNs using the MER (Minick, 1995; Foley et al., 2002; Minick and Harvey, 2003; Kee et al., 2005; Wynn et al., 2009). In these research studies the Cronbach's alpha ranged from .84 to .93. As mentioned, caring has been linked to the early recognition of patient deterioration in other studies (Minick, 1995; Parker, Minick, and Kee, 1999; Minick and Harvey, 2003). Minick, the creator of the MER stated, "Caring was closely related to the concept of knowing the patient"

(Minick, 2003, p. 295). Minick stated that the data from the interviews "revealed that caring, as manifested by an involved stance from the nurse, can actually heighten nurses' perceptions, thus improving assessment skills and enabling the early recognition of patient problems" (2003, p. 295). Minick has called this phenomenon "the power of human caring" (Minick, 1995, p. 303). Minick reported "The power of human caring sharply contrasts with situations where the recognition of patient problems was delayed or never occurred; these situations were characterized by a detached relationship between the nurse and patient" (2003, p. 295).

Results

From the 197 survey packets collected, 166 met the inclusion criteria and were used for the data analysis reported in this study (n=166). The reasons for exclusion of a survey packet (n=31) were: failure of the subject to complete the research instruments completely (n=22), subject had worked less than 12 months at the current place of employment (n=3), not

reporting the number of RRT calls (n=2), and reporting zero calls to the RRT (n=4). Table 1 shows demographics of the study subjects. SPSS version 28 was used to perform the inferential statistical test and analyze demographic data. To control confounding variables demographic data was collected. The demographic data collected was: age, gender, ethnicity, education level, specialty certification(s), years of experience as an RN, time in current position, shift worked, number of hours worked on each shift, and number of overtime hours worked. Confounding categorical variables were controlled for by either two independent means t-tests (gender and certification) or one-way ANOVA (type of education, unit worked, and ethnicity). Age, years of experience, and hours worked per shift were controlled by using a correlational analysis. The purpose for doing this type of

analysis is to determine if there is any relationship between the study variables and the subject's demographic characteristics. No relationship was found between study variables and demographic characteristics.

Results from the MER

The subjects' MER scores ranged from 36 to 79 ($M= 64.21$, $SD= 10.25$). The MER score was negatively skewed (skewness= -0.392). Kurtosis (-0.819) was found to be normal (Munro, 2005). The MER data contained no outliers that required statistical correction. The distribution approximates a normal distribution, and no statistical correction was made. The Cronbach's alpha for the MER was .91. The frequency distribution of the subjects MER scores is shown in figure 1.

Frequency of RRT Calls

The range of RRT calls was 1 to 15 ($M=3.44$, $SD=2.75$). A frequency distribution of the RRT scores is shown in figure 2. The distribution of RRT calls was also positively skewed (skewness= 1.42). Kurtosis (kurtosis= 2.75) was outside the normal range (Munro, 2005). The mode of RRT calls was one, which is causing kurtosis. Out of 166 subjects, 53 (31.9%) reported 1 RRT call in the last 12 months. No statistical correction was done on frequency of RRT calls and no outliers were removed from the data set.

Relationship Between MER Score and Frequency of RRT Calls

The research question tested in this study was do RNs who possess higher levels of skill at early recognition of physiological deterioration activate the RRT more frequently than RNs with lower levels? This skill is the ability to recognize the early signs of clinical deterioration and intervene to prevent FTR by activation of the RRT. Higher levels of this skill would be reflected by an increased frequency of RRT activation. There was a positive

correlation ($r= .402$) between the score on the MER and number of RRT calls. The correlation was significant ($p = .0120$). Higher scores on the MER instrument were positively correlated to frequency of RRT activation. Thus, the research hypothesis was supported by the results and the null hypothesis was rejected.

Conclusions: The MER is based on the concepts of knowing and caring. This study found that increased scores on the MER, indicating a caring stance, were correlated with an increased frequency for RRT activation. Increased RRT activation has been linked in the literature to reduced mortality rates. The connection between caring, knowing and preventing failure to rescue is seen as the caring stance of the RN combined with Carper's ways of knowing. These combine to allow a RN with this worldview to detect patient deterioration and act to rescue the patient by calling the RRT and avoiding FTR.

Discussion

The findings of this study indicate that RNs with higher levels of skill in the early recognition of clinical deterioration, based on MER score, activated the RRT more frequently than RNs with lower levels of skill in the early recognition of clinical deterioration. The international literature from Korea supports the notion that activation of RRT improved patient outcomes in like cardiac arrest (Ko et al., 2020). A study in Jung, et al., 2022, found that as the RRT was being activated with increased frequency over time and that mortality rates followed this decreasing trend as RRT activation increased.

A Study from Switzerland (Balshi, et al., 2022) found that by increasing RRT activation rates utilizing technology resulted in reduced CPR events and rates, improved CPR success rate, reduced hospital length of stay and mortality

Recall that there is a subjective criterion for activation of the RRT. The subjective criteria

to activate the RRT is that the staff is seriously concerned or worried about the patient. Could it be that RNs who come to know their patients and practice with a caring stance are more likely to utilize the full criteria for RT activation?

Maybe they recognize the early subtle subjective signs of deterioration and become seriously concerned or worried about the patient. This would lead to the activation of the RRT more frequently. An increase in frequency of RRT activation has been correlated to a reduction in mortality (Chen et al., 2009).

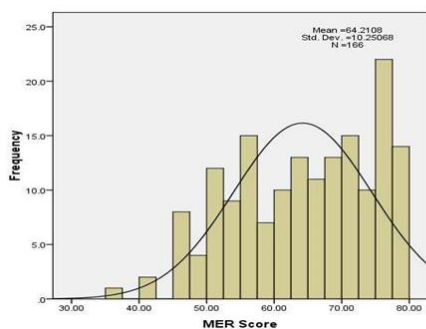
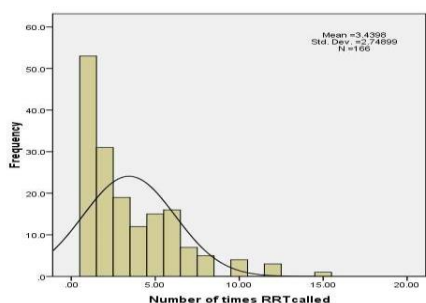
The literature supports the notion that more frequent RRT activation lowers mortality rates (Chen et al., 2009). The results of this study found that there was a positive, significant correlation between the MER score and RRT call frequency. A higher level of skill at the early recognition of patient deterioration resulted in a higher frequency of RRT calls. The MER is based on the concepts of knowing and caring.

Minick, the creator of the MER stated, “Caring was closely related to the concept of knowing the patient” (Minick, 2003, p. 295). Minick stated that the data from the interviews “revealed that caring, as manifested by an involved stance from the nurse, can actually heighten nurses’ perceptions, thus improving assessment skills and enabling the early recognition of patient problems” (2003, p. 295).

Thus, the connection between caring, knowing and preventing failure to rescue is seen as the caring stance of the RNs, combined with Carper’s ways of knowing. These combine to allow a RN with this worldview to detect patient deterioration and act to rescue the patient by calling the RRT and avoiding FTR.

Table 1: Demographics of Sample

Frequency		Percentage %
Gender (n=158)		
Female	133	80.1
Male	25	15.1
No response	15	4.8
Age (n=151) M=39.1, SD=10.5		
20-29	35	21
30-39	51	28.8
40-49	37	22.2
50-59	28	16.8
60-70	3	1.8
No response	15	9
Ethnicity (n=159)		
Caucasian	90	54.2
Black	40	24.1
Hispanic	18	10.8
Asian	8	4.8
Other	3	1.8
No response	6	3.6
Education (n=161)		
BSN	85	51.2
AD	53	31.9
Diploma	12	7.2
MSN	10	6
EdD	1	0.6
No response	6	3.6
Certification (n=161)		
No	131	78.9
Yes	30	18.1
No response	5	3

Figure 1: Distribution of MER Scores**Figure 2:** Distribution of RRT Calls.

Implications: Further research is needed in this area to confirm this correlation. It is possible that by introducing RNs to caring theory and Carper's ways of knowing during their education and reinforcing that once in practice, the frequency of RRT calls could increase and possible lower mortality. This offers a way to improve the mixed outcomes seen with RRT use.

Limitations: Limitations include sample size and self-report of RRT activation. The assumption that acuity was equally spread out to the RN who called the RRTs in this study.

References

American Association of Colleges of Nursing, 2022. Fact Sheet: Nursing Shortage. Available from: [accessed 5 February 2024]. (American Nurses Association (ND) Nurse Staffing Crisis Available from: <https://www.nursingworld.org/practice->

policy/nurse-staffing/nurse-staffing-crisis/ [accessed 21 October 2022].

- Balshi, A. N., Al-Odat, M., Alharthy, A. M., Alshaya, R. A., Alenzi,.....(2022). Tele-Rapid Response Team (Tele-RRT): The effect of implementing patient safety network system on outcomes of medical patients–A before and after cohort study. *PLoS One*, 17(11)<https://doi.org/10.1371/journal.pone.0277992>
- Beaumont, K. (2008) Deterioration in hospital patient's early signs and appropriate actions. *Nursing Standard* 23(1), 43-48.
- Bellomo, R., Goldsmith, D., Shigehiko, U., Buckmaster, J., Hart, G., Opdam, H. & Gutteridge, G. (2004) Prospective controlled trial of the effect of medical emergency team on postoperative morbidity and mortality rates. *Critical Care Medicine* 32(4), 916-921.
- Calzavacca, P., Licari, E., Tee, A., Egi, M., Downey, A., Quach, J. & Bellomo, R. (2010) The impact of rapid response system on delayed emergency team activation patient characteristic and outcomes-a follow-up study. *Resuscitation* 81, 31-35.
- Carper, B. A. (1978) Fundamental patterns of knowing in nursing. *Advances in Nursing Science* 1(1), 13-23.
- Clark, S. & Aiken, L. (2003) Failure to rescue. *American Journal of Nursing* 103(1), 42-47.
- Cohen, J. (1987) *Statistical power analysis for the behavioral sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Downey, A. W., Quach, J. L., Haase, M., Haase-Fielitz, A., Jones, D., & Bellomo, R. (2008) Characteristics and outcomes of patients receiving a medical emergency team review for acute change in conscious state or arrhythmias. *Critical Care Medicine* 36(2), 477-481.
- Chen, J., Bellomo, R., Flabouris, A., Hillman, K., & Finfer, S. (2009) The relationship between early emergency team calls and serious adverse events. *Critical Care Medicine* 37(1), 148-153.
- Cimiotti, J.P., Becker, E.R., & Li, Y. (2022) Association of Registered Nurse Staffing With Mortality Risk of Medicare Beneficiaries Hospitalized With Sepsis. *JAMA Health Forum* 3(5),1173-1186.

- Foley, B.J., Kee, C. C., Minick, P., Harvey, S. S., & Jennings, B. M. (2002) Characteristics of nurses and hospital environments that foster satisfaction and clinical expertise. *Journal of Nursing Administration* 32(5), 273-282.
- Franz, F., Edgar E., Lang A., & Buchner, A. G. (2007) G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods* 39 (2), 175-191.
- Hillman, K., Chen, J., & Cretikos, M. (2005) Introduction of the medical emergence team (RRT) system: a cluster-randomized controlled trial. *Lancet* 365, 2091-2097.
- Hourihan, F., Bishop, G., Hillman, K., Daffurn, K., & Lee, A. (1995) The medical emergency team: A new strategy to identify and intervene in high risk patients. *Clinical Intensive Care* 6, 269-272.
- Jones, D., Bellomo, R., Bates, S., Warrillow, S., Goldsmith, D., & Hart, G. (2006) Patient monitoring and the timing of cardiac arrests and medical emergency team calls in a teaching hospital. *Intensive Care Medicine* 32, 1352-1356.
- Jung, H., Ko, R., Ko, M. G., & Jeon, K. (2022). Trends of in-hospital cardiac arrests in a single tertiary hospital with a mature rapid response system. *PLoS One*, 7(1)<https://doi.org/10.1371/journal.pone.0262541>
- Kee, C. C., Foley, B. B., Dudley, W. N., Jennings, B. M., Minick, P., & Harvey, S. S. (2005) Nursing structure, process and patient outcomes in army medical centers. *Western Journal of Nursing Research* 27(8), 1040-1058.
- Ko, B.S., Lim, T.H., Oh, J., Lee, Y., Yun, I., Yang, M.S., Ahn, C. & Kang, H. 2020, The effectiveness of a focused rapid response team on reducing the incidence of cardiac arrest in the general ward, *Medicine (Baltimore)*, vol. 99, no. 10, pp. e19032-e19032.
- Minick, P. (1995) The power of human caring: early recognition of patient problems. *Scholarly Inquiry for Nursing Practice* 9(4), 303-317.
- Minick, P. (2003) Manifestations of early recognition: A measure of nursing expertise. In O.L. Strickland & C. Dilorio (Editors), *Measurement of nursing outcomes: Vol. 2: Client outcomes and quality of care* (pp. 294-304). New York, NY: Springer.
- Minick, P. & Harvey, S. (2003) The early recognition of patient problems among medical- surgical nurses. *Medsurg Nursing* 12(5), 291-297.
- Munro, B.H. (2005) *Statistical methods for health care research* (5th ed.). Philadelphia: Lippincott.
- Nurmi, J., Harjola, V. P., & Castren, M. (2005) Observations and warning signs prior to cardiac arrest. Should a medical emergency team intervene earlier? *Acta Anaesthesiologica Scandinavica* 49, 702-706.
- Parker, C. B., Minick, P., & Kee, C. C. (1999) Clinical decision-making processes in perioperative nursing. *AORN Journal* 70(1), 45-63.
- Quach, J. L., Downey, A. W., Haase, M., Haase-Fielitz, A., Jones, D., & Bellomo, R. (2008) Characteristics and outcomes of patients receiving an emergency team review for respiratory distress or hypotension. *Journal of Critical Care* 23, 325-331.
- Rosenberg, K. (2019) RN Shortages Negatively Impact Patient Safety. *American Journal of Nursing* 119 (3), p.51
- Saket, G., Philip, G., Peberdy, M.A., Vaughan-Sarrazin, M.S., & Chan, P.S. (2022) Association of rapid response teams with hospital mortality in medicare patients. *Circulation: Cardiovascular Quality and Outcomes* 15(9) 116-124.
- Spearpoint, K. (2008) Resuscitating patients who have a cardiac arrest in hospital. *Nursing Standard* 23(14), 48-57.
- Tirkkonen, J., Tamminen, T., & Skrifvars, M. (2017) Outcome of adult patients attended by rapid response teams: A systematic review of the literature. *Resuscitation* 112, 43-52.
- Joint Commission. (2008) National patient safety goals. Available from: <http://www.jointcommission.org/PatientSafety/NationalPatientSafetyGoals>. [accessed 25 October 2022].