IMPROVING ACCURACY OF EVALUATING CONCUSSIONS WITH THE COBRA TOOL

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BACKGROUND OF THE PROJECT

- Concussion or a traumatic brain injury (TBI) diagnosis accounts for over 1 million inpatient stays and treat-and-release emergency department (ED) visits in 2017. (Reid & Fingar, 2020)

  Individuals with a concussion can suffer long-term effects (Sabet et al., 2021)

History of the Problem

- Use of micromobility devices
- Increase incidence of head injuries in a University-based health clinic
- Not evaluated immediately but in 2-3 days

SWOT Analysis

Project need

- Current tool like sideline concussion evaluation tools which are used immediately following the injury
- Need of an adequate tool to use in an outpatient setting

SYNTHESIS OF LITERATURE

Search Methods

- CINAHL, PubMed, Brain Sciences, Google Search

Themes

- Concussion evaluation tools, phenotypes or subtypes of concussions, impact of concussion, risk factors for concussion, concussion symptoms

Primary Articles:

- COBRA Tool (Katz, et al, 2020)
- Representation of Concussion Subtypes in Common Postconcussion Symptom-rating Scales (Lumba-Brown et al., 2019)

Findings

- Need for a concise concussion evaluation tool which includes assessment of phenotypes
- Some tools have demonstrated effectiveness & should be considered when creating new concussion evaluation tools
- Systematic reviews & Meta-Analysis identified need to use tools that assess

EVIDENCE-BASED PRACTICE QUESTION

- To what degree would the implementation of the translation of Lumba-Brown et al's. research on the phenotypes of concussions utilizing the Concussion Office Based Rehabilitation Assessment (COBRA) scale would impact the accuracy of evaluating concussions for determination of diagnostic testing or neurological referral, among adult patients in an Arizona, university-based health clinic, over a period of eight weeks?

THEORETICAL FRAMEWORK

Kristen Swanson's Theory of Caring

- Derived from Watson's Caring Theory
- Caring is a foundation to the nursing profession
- Five Tenets
- Align in project

Deming's PDSA Change Model

- Extension of Walter Shewart (1920) model Plan, Do, Check, Act (PDSA)
- Commonly use in Quality Improvement initiatives across various professions & businesses
- 4 Stages
- Steps to drive change

CHRISTIAN WORLDVIEW

Christianity values

- Trust
- Integrity
- Commitment
- Nurturing

Relationship

- Kristin Swanson's Caring Theory aligns with Christian values
- Nursing Profession expected to follow these values
- Individuals who have experienced a head injury needs to feel valued and deserve high quality care

PURPOSE STATEMENT

The purpose of this quality improvement project was to determine if the translation of Lumba-Brown et al's. research on the phenotypes of concussions utilizing the Concussion Office Based Rehabilitation Assessment (COBRA) scale would impact the accuracy of evaluating concussions for determination of diagnostic testing or neurological referral, among adult patients in an Arizona, university-based health clinic, over a period of eight weeks.

Variables

- Independent variable-COBRA Tool
- Dependent variable-Number of individuals who are referred for further neurological testing or consult

INTERPROFESSIONAL COLLABORATION

Internal and external stakeholders

- Internal: Nurse Practitioners
- External: Individuals with a head injury & their family

Support

- Clinic Manager/Mentor
- Clinic Staff
- University Leadership

Characteristics of the team

- Nurse Practitioners, Physician, Clinic staff

FEASIBILITY

Overview

- Implementation of a new concussion evaluation tool in a University Health Clinic

Staff

- 23 Nurse Practitioners
- Medical Physician
- Clinic Manager
- Clinic Support Staff—receptionist, student workers

Supplies

- None

Technology

- Electronic Health Record

Costs

- Potential cost of student worker to pull past paper ACE tool documents

PROJECT MANAGEMENT PLAN

Step 1

- Integration of COBRA tool into the electronic health record
- Training of Staff

Step 2

- Data Collection
- Ongoing Support

Step 3

- Data Analysis & Results
- Dissemination of Results
- Publication

SETTING AND SAMPLE POPULATION

Setting

- University Health & Wellness Clinic
- Main Campus in Phoenix, Arizona
- Own community—Houses 16,000 residential students & 7500 commuting students
- Main Campus
- Outpatient
- Basic Health care evaluation and treatment

Population

- 18 years of age and older
- Experienced a head injury
- Convenience Sampling
  * Any individual who experience a head injury
  * Exclusion prior diagnosis of concussion

INSTRUMENTATION AND DATA SOURCE

Data Source

- Electronic Health Record (Pyramed)

Instrument

- Chi-square test

Validity

- Dependent upon assumptions made by the provider & individual entered into record

Reliability

- High

BIAS AND ETHICAL CONSIDERATIONS

Potential bias

- Sampling bias
- Implicit bias
- Analytic bias

Ethical considerations

- Bellmont Report
  - All individuals will be evaluated
  - All individuals will be respected

    * HIPAA
  - All individuals will be treated with kindness & caring
- No conflicts of interest is expected

DATA ANALYSIS

- ACE group
  Evaluated prior to the implementation of the COBRA tool
  Approximately same time frame
- COBRA group
  Individuals evaluated with COBRA tool upon implementation of the project (Approximately
  mid-December)
- Procedure completed
  1. Descriptive and referral data collected from each group
  3. Entered data into SPSS database
  4. Analysis of the descriptive and statistical results

- Chi-square test

- Rationale for using Chi-square
  Comparison & Relational between two variable

DESCRIPTIVE DATA-SAMPLE POPULATION

Characteristics of the Participants

Characteristic	ACE Tool Comparative Group ($n = 48$)		COBRA Tool Implementation Group ($n = 39$)	
	n	*%*	*n*	*%*
Age				
18-20 years	39	81.3	29	74.4
21-30 years	9	18.8	9	23.1
>30 years	0	0.0	1	2.6
Gender				
Male	10	20.8	28	71.8
Female	38	79.2	11	28.2
Race				
Caucasian	28	58.3	31	79.5
Hispanic	2	4.2	0	0.0
Black	5	10.4	3	7.7
Asian	6	12.5	1	2.6
Native American	2	4.2	1	2.6
Other	5	10.4	3	7.7
Cause of Head Injury				
Human Powered Device	10	20.8	9	23.8
Electric Powered Device	3	6.3	2	5.3
Fall	20	41.7	7	18.4
Assault	1	2.1	1	2.6
Sport-related	4	8.3	10	26.3
Other	10	20.8	9	23.7

Note. n = count; % = percentage

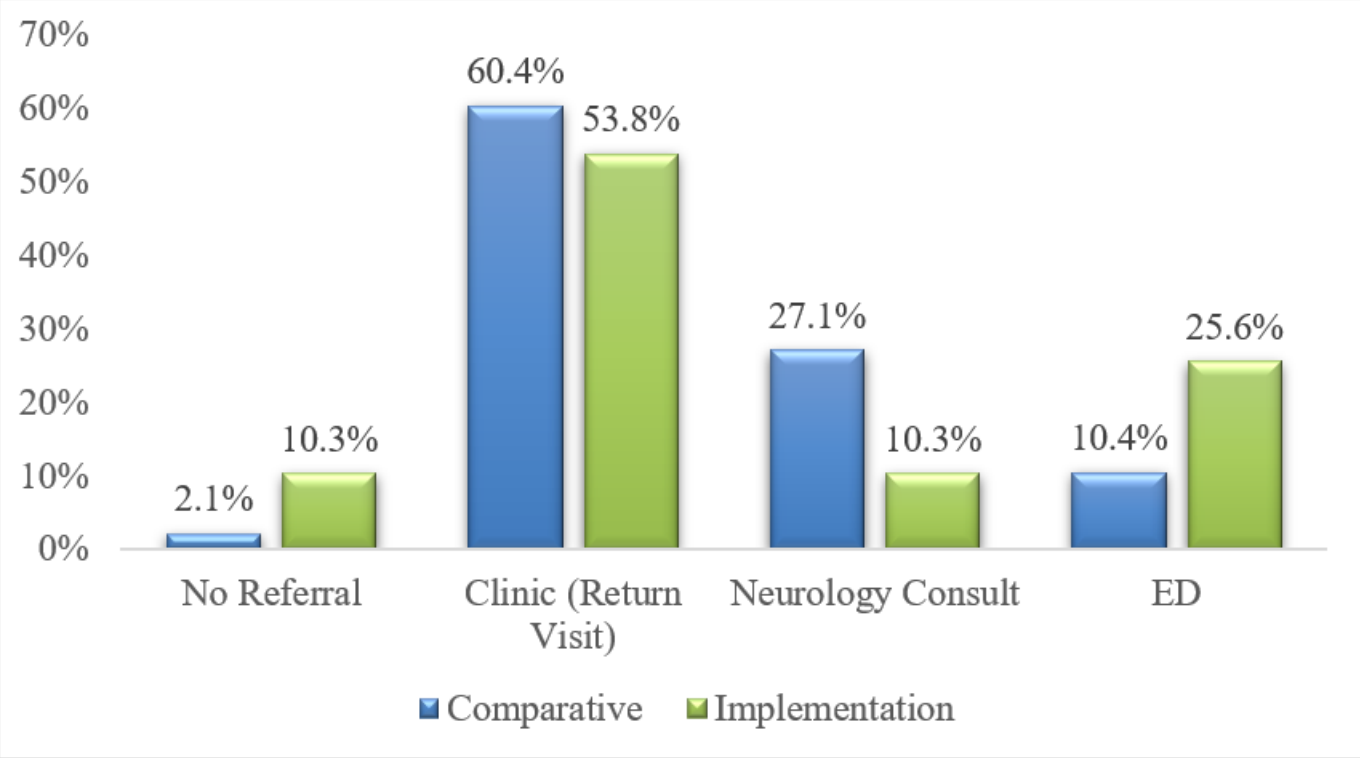
RESULTS

Total Number of Referrals

Variable	Comparative – ACE Tool		Implementation – COBRA Tool			
	n	%	*n*	%	X^2 (1)	*p*
Referrals	47	97.9	35	89.7	2.65	.103

Note. n = count; % = percentage

Referral Type



INTERPRETATION OF FINDINGS

- Findings did not support the clinical question
- Did demonstrate clinical significance with increase in number of referrals to the ED
  - Katz et al., 2020
  - Lumba-Brown et al., 2019
  - Maruta et al., 2018
  - Langdon et al., 2020
  - Studies support need to diagnosis and treat a concussion to prevent long-term complications & improved quality of life

- ***Explanations***
  - Time of the year or semester project implemented
  - ACE group data from Fall semester, COBRA group data from Spring semester
  - NP's level of confidence improved with using the ACE tool

STRENGTHS AND LIMITATIONS

- ***Project Strengths***
  - Methodology
  - Integration of COBRA tool into EHR (technology)
  - Culture of the clinic

- ***Project Limitations***
  - Timeframe
  - Sample size
  - Certain phenotypes assessments and needed equipment/space

IMPLICATIONS

- ***Theoretical Implications***

  NP referring individuals for further evaluation & treatment-Caring behavior

  Trusting and support provided

- ***Nursing Practice Implications***
  - The best practice in evaluating individuals who have experienced a head injury
  - Integration of assessment of phenotypes in neurological tool used in setting (e.g., neuro checks)
  - Further research on if specific presence of phenotypes more common

RECOMMENDATIONS-FUTURE PROJECTS

- Quantitative Longitudinal Study
- Prevalent phenotypes
- COBRA tool compared to other concussion evaluation tools
- Use of COBRA tool in other settings

RECOMMENDATIONS-SUSTAINABILITY

- Feedback from NPs
- Updates to the COBRA tool in the EHR
- Follow-up on outcomes

ADDITIONAL PLANS FOR DISSEMINATION

- ***Neurological Organizations & Associations***

- ***Nurse Practitioner Organizations***

- ***Peer-reviewed journal to target for publication***
  - Oral dissemination opportunities
  - Regional, state, national, or international

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