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Beyond Reference Data: A Qualitative Analysis of Nursing Library Chats to Improve Research Health Science Services

Samantha Harlow

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Résumé de l'article

Objective - The objective of this study was to analyze trends in academic library reference chat transcripts with nursing themes, in order to improve all library services and resources based on the findings. Methods - In Fall 2018, health science liaison librarians performed a qualitative study by analyzing 60 nursing chat transcripts from LibraryH3lp. These chats were tagged, anonymized, coded, and then analyzed in Atlas TI to identify patterns and trends. Results - Chat analysis showed that librarians staffing chat are meeting the research needs of nursing patrons by helping them find full-text articles and suggesting the appropriate library databases. In order to further improve these virtual services, workshops were offered to Library and Information Science (LIS) interns and staff who answer reference chats. Nursing online tutorials and research guides were also improved based on the results. Conclusion - This study will help academic libraries improve and expand services into the virtual realm, to support library employees and patrons during the COVID-19 pandemic and beyond. Virtual reference chat is not going away; in the current academic environment it is needed more than ever. Using these library chats as the basis for additional chat staff training can reduce staff anxiety and prepare them to better serve patrons.

Evidence Based Library and Information Practice

Research Article

Beyond Reference Data: A Qualitative Analysis of Nursing Library Chats to Improve Research Health Science Services

Samantha Harlow
Online Learning Librarian
University of North Carolina Greensboro
Greensboro, North Carolina, United States of America
Email: slharlow@uncg.edu

Abstract

Objective - The objective of this study was to analyze trends in academic library reference chat transcripts with nursing themes, in order to improve all library services and resources based on the findings.

Methods - In Fall 2018, health science liaison librarians performed a qualitative study by analyzing 60 nursing chat transcripts from LibraryH3lp. These chats were tagged, anonymized, coded, and then analyzed in Atlas TI to identify patterns and trends.

Results - Chat analysis showed that librarians staffing chat are meeting the research needs of nursing patrons by helping them find full-text articles and suggesting the appropriate library databases. In order to further improve these virtual services, workshops were offered to Library and Information Science (LIS) interns and staff who answer reference chats. Nursing online tutorials and research guides were also improved based on the results.

Conclusion - This study will help academic libraries improve and expand services into the virtual realm, to support library employees and patrons during the COVID-19 pandemic and

beyond. Virtual reference chat is not going away; in the current academic environment it is needed more than ever. Using these library chats as the basis for additional chat staff training can reduce staff anxiety and prepare them to better serve patrons.

Introduction

The University of North Carolina Greensboro (UNCG), a mid-sized public research university, has a nursing program with a strong online presence to accommodate the department's large population of non-traditional students. Non-traditional students are defined as students who fall into any one of the following groups: over 24 years of age; entry to college delayed by at least one year following high school; single parents; employed full-time; attending a postsecondary institution part-time; with dependents; financially independent; or not possessing a high school diploma (Choy, 2002). According to the Association of College & Research Libraries (ACRL) Standards for Distance Learning Library Services, academic libraries should provide equitable resources and services for all of their students, including those who learn and study online (2016). In order to meet the needs of all campus researchers and learners, the UNCG University Libraries provide a variety of information literacy services and instruction through the Research, Outreach, and Instruction (ROI) department, which houses academic librarian liaisons. Through the ROI department, liaisons and staff run a very popular virtual chat service, that receives thousands of chats a year. This department also helps students by providing many other virtual and face-to-face services, including: information literacy and research instruction; one-on-one consultations with students and faculty; research guides through Springshare LibGuides platform; and a variety of Canvas (learning management system) integrations, including a LibGuides LTI (learning tools interoperability).

Increasing numbers of nursing programs are moving online, and according to the "Guide to Online Schools: Accredited Online Nursing

Programs by State" website (2019), there are at least 380 online nursing schools in the US. UNCG offers many nursing degrees and certificates, and the Master's of Science (MS) and Post-Baccalaureate Certificate (PBC) in Nursing Administration and Nursing Education are offered fully online (University of North Carolina Greensboro, 2020). UNCG has also identified health education as a focus area for the general student body, with "Health and Wellness" as a theme of the Strategic Plan; this plan characterizes health and wellness as "broadly defined to encompass the many dimensions necessary for individuals to cope, adapt, grow, and develop" (University of North Carolina Greensboro, 2013). Nursing students are a strong online and non-traditional population, and with health and wellness as target areas for campus learning, it is more important than ever to provide effective and equitable health science library reference services to students. Within the Libraries, the health science liaison works with a variety of academic health science departments including Nursing, while the online learning librarian is liaison to Community and Therapeutic Recreation, Kinesiology, and Public Health Education. Liaisons provide a variety of services to their departments, and since Nursing has always had a strong online presence, the health science librarian offers virtual research consultations, webcasts on a variety of research topics, and online orientations for students.

Based on this important student population, the growth of online learning and non-traditional students, and the popularity of the reference chat library service, these two health science liaison librarians performed a qualitative reference analysis on reference chat transcripts from nursing students and instructors. This study was performed in an effort to improve

service offerings in several areas, but particularly chat services to nursing students; improving research services to nursing students also helps a variety of other patrons, including other health science departments and all students studying online. This study sought to answer the following research questions: what trends do we see in library chats based on nursing themes, rather than numbers and usage counts? What patterns exist in nursing chats within the library? How can we improve library services and resources based on nursing chat trends?

Literature Review

A virtual chat service is a vital synchronous online service for library patrons (both face-to-face and distance populations), and there are many studies on providing reference services to researchers through chat. Some studies survey academic librarians about their chat reference services and how they train staff to answer chats (Devine, Paladino, & Davis, 2011), while others explore the usefulness of having full-time librarians provide service through chat reference systems (Maloney & Kemp, 2015). Many chat analysis projects take a large-scale qualitative approach by analyzing datasets of academic chat transcripts to show overall improvements over time (Baumgart et al., 2016; Brown, 2017; Dempsey, 2019). Mungin (2017) at James Madison University analyzed chat transcripts in Dedoose over a five-year span in order to improve chat reference; and as recently as 2019, at Utah State University (which has a high population of students studying online), a group of librarians and learning technologists looked at chat trends over a year by analyzing 1600 chat transcripts through coding. Based on the findings of this analysis, the group made training resources and best practice handouts for answering chats (Eastman et al., 2019). In another chat analysis project, Logan, Barrett, and Pagotto (2019) used coding to analyze almost 500 chat transcripts to find behaviors to avoid. With growing student populations and online services and resources, many libraries must rely

more heavily on non-librarians and student workers staffing virtual reference systems. Barrett and Greenberg (2018) conducted a study proving the value of student workers by performing exit interviews with patrons served. In order to help librarians and their non-librarian colleagues better reach distant students, offering professional development through online research guide or courses within the university learning management system is therefore helpful (Bliquez & Deeken, 2016).

Understanding the information and digital literacy needs of nursing undergraduate and graduate students can help improve library reference services for all students, regardless of whether they are studying online or face-to-face. Librarians have long understood the need for virtual reference services for nursing students. Guillot and Stahr (2004) studied the efficiency of a virtual reference desk for nursing patrons at their university and found that distance nursing students valued the online research support system. Many qualitative studies have been performed on the research needs of nursing students. Interviewing nursing students who may be studying online can help librarians understand the unique life experiences of these students and their information and digital literacy skills (Craig & Corrall, 2007; Duncan & Holtslander, 2012; Ledwell et al., 2006; Reeves & Fogg, 2006; Stein & Reeder, 2009). Surveys are another method of understanding the information seeking needs of nursing students; for example, Al-Gamal and colleagues' (2018) surveyed nursing students about stress and the coping strategies they used during their clinical rotations.

The increasing shift toward online nursing education means that it is more vital than ever to provide a variety of asynchronous virtual research training for nursing students who prefer this method of help over synchronous chats; research guides such as Springshare LibGuides and online tutorials can help accommodate nursing students on their own time. Nursing research guides can serve as

portals for accessing virtual and physical collections (Johnson & Johnson, 2017). Stankus and Parker (2012) performed a study on nursing LibGuides across the US from a variety of libraries and found the information on the guides diverse and varied; there were some commonalities, such as inclusion of major medical databases and resources like EBSCO's CINAHL, as well as PubMed/MEDLINE, and a focus on evidence based practice to inform research. LibGuides can house online tutorials on a variety of information literacy health science topics. Online tutorials can include various multimedia such as videos, PDFs, presentations, and more, and can be created by faculty, instructional designers, or librarians. Online tutorials are time consuming to create, but they are powerful tools for asynchronous educational opportunities for nursing students studying online. Nurses and librarians have demonstrated in a variety of studies that using online tutorials in a flipped classroom approach or through an online guide is valuable (Gilboy et al., 2015; Schlairet et al., 2014; Schroeder, 2010). Lastly, creating online synchronous courses or professional development opportunities can better reach many nursing students (Smith & O'Hagan, 2014).

Librarians have consistently provided information literacy and reference consultations, instruction, and assessment to nursing students, ideally while also integrating the important competency of evidence based practice (EBP) (Adams, 2014). Librarians are adapting to the demographics of nursing programs and adjusting services for an increasingly online population. When nursing researchers are surveyed or interviewed about their information literacy and evidence based practice essentials, there is a call for more digital support and expanding research services to include grant-writing, scholarly communication, and data management (Nierenberg, 2017; Wahoush & Banfield, 2014). Though more and more online library services and tutorials are being offered to nursing students, some of these students are not digital natives and may not possess all of the

computer literacy skills needed for researching online (Turnbull, Royal, & Purnell, 2011; Brettle & Raynor, 2013). Virtual chat, library services, and asynchronous information literacy instruction are widely discussed in the literature, but no previous studies combine the research needs of nursing students with an in-depth chat analysis of this population. This study seeks to analyze nursing reference chats to help academic librarians better serve all patrons.

Methods

The LibraryH3lp system is used to provide virtual chat reference to UNCG library patrons. This chat service is available to non-UNCG patrons as well, but this study only analyzes transcripts of internal patrons. This chat service is staffed mostly by personnel in the ROI department, along with some librarians and staff from the Music Library and the Special Collections and University Archives (SCUA) department. These chats are also answered by UNCG Library and Information Studies (LIS) graduate student interns working in the ROI department. During a typical semester, chat service is online and active from 8:00am until 11:45pm Monday through Thursday, and during the day and into the early evening on Friday through Sunday. LibraryH3lp is heavily used, receiving around 3500 chats a year.

In Fall 2018, the two health science liaison librarians downloaded all full chat transcripts from the months August, September, and November 2016, with a total of 1416 chat transcripts. This time frame was selected to avoid singling out any current librarians, staff, or students taking chats because these months provided a sampling of the busiest Fall semester months. To find these transcripts, a CSV file was created from the backend of LibraryH3lp of all chat transactions from Fall 2016, and then edited based on the selected months. The CSV file was converted into a XLS file to perform a "control find" of nursing keywords to identify relevant chats. These keywords were developed by the health science librarian, who is the nursing

department liaison, based on instruction sessions and common research services, questions, or issues that arise within the nursing department. The keywords used to identify the chats were: Nur*, Cumulative Index to Nursing and Allied Health Literature (CINAHL); PubMed; Lea (first name of the health science librarian); Evidence Based Practice (EBP); systematic reviews; integrative; health; hospital; patient; clinical; anesthesia; Doctor of Nursing Practice (DNP); Bachelor of Science in Nursing (BSN); Master's of Science in Nursing (MSN); practitioner; geriatric; and patient, population, problem, intervention, comparison, and outcome (PICO).

Based on this keyword and search method, 60 chat transcripts were identified and pulled from the original 1416 transcripts into Box (UNCG's most secure cloud storage system) using the Note platform. Putting the transcripts within Box Note allowed each transcript to also have relevant metadata attached, such as date, length of time the patron waited before staff were able to engage with the chat, source of the chat, length of the chat, category of chat (Reference, Service, Technology, Library Directions, or Services), description of chat, and READ (reference effort assessment data) scale rating. READ scale is a measurement of the difficulty level of the reference transaction of the chat (Karr Gerlich, n.d.). Another reason the transcripts were placed in Box Notes was to redact any identifying information related to students or instructors, such as names, email addresses, or phone numbers. From the chat data, a master spreadsheet was created in Google Sheets, allowing librarians to see the overall trends of length of chat, time of chat, READ scale, and more.

Once the transcripts were anonymized within Box Notes, one PDF of the selected transcripts was created and read by both librarians. These librarians then created groups of themes and corresponding codes to determine an overall and consistent list to be applied to the transcripts. Both librarians coded the chat

transcripts based on the following groups: Information Need, Reference Interviewing, Recommendations, Patron Emotions, and Challenges and Barriers. See Table 1 for a full list of codes used for this analysis, organized by groups.

Both librarians attended assessment workshops on coding qualitative research in Atlas TI by UNCG OAERS (Office of Assessment and Evaluation Research Services). The research design for this study was informed by Creswell and Poth's (2017) guide, which suggests five traditional qualitative research approaches: narrative research, phenomenology, grounded theory, ethnography, and case study. This study used the narrative research approach, considering the virtual chats the narrative to be analyzed. When the codes were finalized, they were input and applied to transcripts using Atlas TI. The librarians initially applied the codes on separate sets of transcripts, and then switched transcript sets to ensure that each chat was examined by both parties. To minimize bias and errors when the transcripts were switched, each party checked the other's codes for consistency and gaps. From Atlas TI, the code group could be used to analyze chats based on the individual codes. All forms of qualitative research are subjective and results can shift depending on the individual reading and coding of each transcript. Though there were two coders on each transcript, themes could be missed based on the length of chat or state of the reader.

Results

Information Need

The first code group to be analyzed was "Information Need", in order to establish trends of research of nursing library patrons. When looking at the coding group of "Information Need", the most common themes were students and instructors looking for the full-text of a known item, such as an article or e-book, and searching strategies for research assignments

Table 1
Code Groups and Codes for Fall 2016 UNCG Libraries Virtual Chat Nursing Transcripts Analysis,
Inputted into Atlas TI

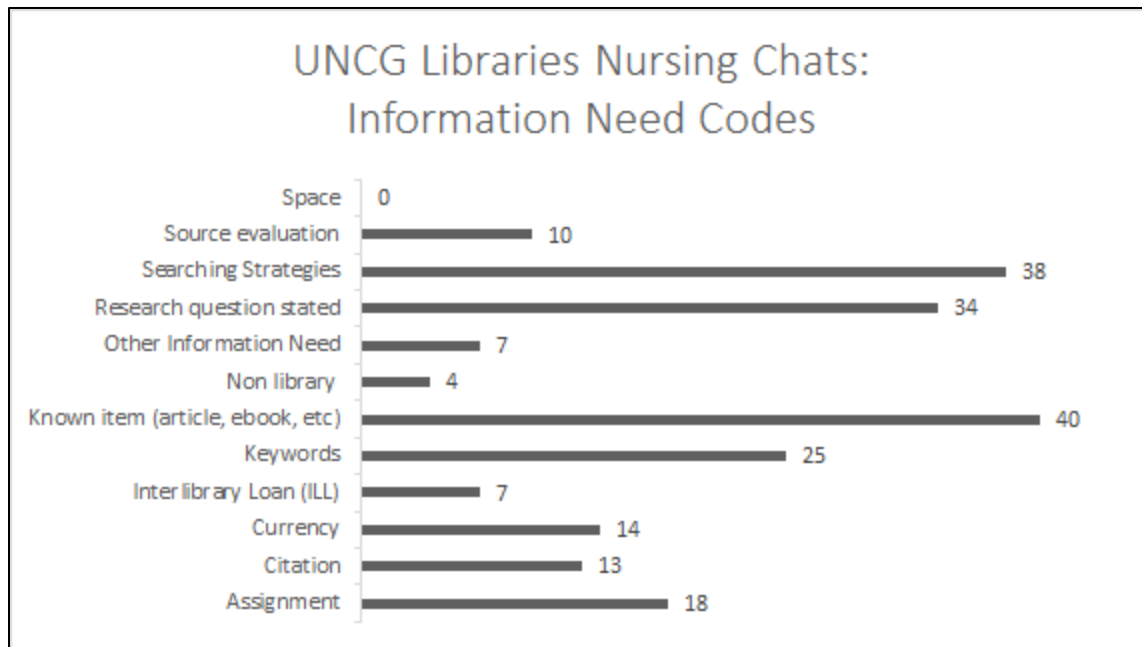| Code Group:	Codes within Group:
Information Need	Keywords, searching strategies, hours, space, assignment, research question stated, course mentioned, student type DNP, student type BSN, student type Masters, Student Type RN/BSN, student type Doctoral, student type DNP Anesthesia, resource type peer review, resource type integrative review, resource type systematic review, resource type research article, resource type evidence based, resource type theoretical article, resource type law or court cases, citation, known item journal, known item article, known item database, known item e-book, known item other, currency, source evaluation, non-library resource writing center, non-library resource tutoring, non-library resource technology assistance, non-library resource community partners, other information need
Reference Interviewing	Request for clarification of research need, ask for course number, navigation of resource, ask if more assistance needed, confirmation need was met, transferred chat, other reference interviewing
Recommendations	Database CINAHL, database PubMed, database Dynamed Plus, database Healthy People 2020, database Cochrane, database Scopus, database PsycINFO, database Academic Search Complete, database ProQuest, database other, journal A-Z list, assistance library catalogue, referral liaison, referral instructor, filters in catalogue or database, interlibrary loan (ILL), citation management Zotero, citation management EndNote, library tutorials PATH, library tutorials other, course guide, subject guide, physically come into the library, other recommendation
Patron Emotions	Frustration, gratitude, stress and anxiety, uncertainty, other patron emotions
Challenges and Barriers	Full-text, service not working, resource not working, access off campus, access through browser, access database, access catalogue, access e-book, access textbook, permalinks, interdisciplinary research need, misunderstandings assignment, misunderstandings other, business librarian, business of patron, patron disappears, technical issue, too many results, too few results, usability website, usability chat, other challenges and barriers

UNCG Libraries Nursing Chats: Information Need Codes

Code	Value
Space	0
Source evaluation	10
Searching Strategies	38
Research question stated	34
Other Information Need	7
Non library	4
Known item (article, ebook, etc)	40
Keywords	25
Interlibrary Loan (ILL)	7
Currency	14
Citation	13
Assignment	18

Figure 1
Chart depicting the amount of times "Information Need" was coded, meaning the need of the patron chatting for research help.

(Figure 1). Patrons stating their research question, keywords, and assignments were also heavily coded. The code of "Space" got no mentions in this set of nursing chats.

Patron Emotion

Findings within the "Patron Emotion" code group show that people answering chats are doing an effective job of providing permalinks, offering descriptions of navigating to resources, creating keywords, boosting students' academic confidence, and helping them learn more about the research process. The "Gratitude" code was often found within the transcripts. Many chats ended with nursing patrons saying "Thank you so much! This was so helpful!", particularly when learning about how to narrow down search results, how to use allied health and nursing library resources, and how to use library databases more efficiently. In many chats nursing students could immediately use the research skills showcased in the chat in their research. For example, one chat patron stated: "I'll try to limit [my search results] down with keywords, but that database has better results!"

The most coded emotion from patrons was "Gratitude", but the second most coded was "Uncertainty", followed by "Frustration". Sometimes patrons were unsure of their needs since they were new to the research process. For example, it was not uncommon for nursing patrons to write in messages like, "Hey. Never done this before but I'm having some difficulty finding articles on my topic and I know there are articles out there. I am just not finding them. Can you help?" Many times, the chat nursing patrons note being busy working, as well as being a student, so not having time to properly research their assignment. In some cases, the patrons were at work while chatting with librarians, such as in this scenario where the patron writes "currently at work and tried using the library online already and having trouble which is why I want to physically go in."
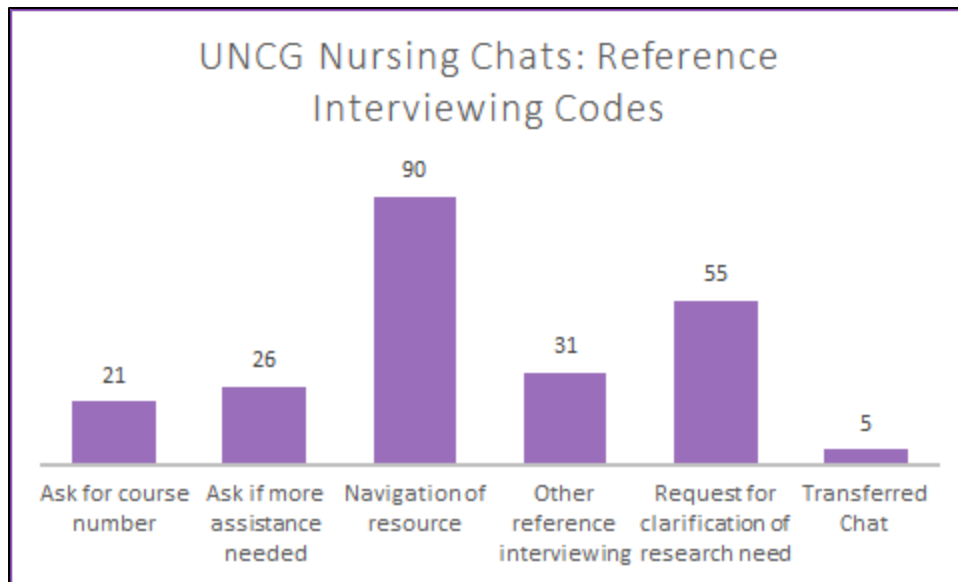
Figure 2

Chart of UNCG Libraries nursing chats showing the "Reference Interviewing Codes", showing the interactions of the librarian answering the chat questions.

Reference Interviewing

Reference interactions of the people answering the chats were also coded (Figure 2). Librarians, students, and staff answering reference chats consistently provided navigation to resources and requested clarification of research needs. There were fewer instances of those staffing chat asking students for the course number for their specific nursing course (only 35% of chats requested a course number). A small number of nursing chats were also transferred to other people staffing chat based on their expertise or availability.

Challenges and Barriers

The most common challenges and barriers of the chats were also coded. "Full-text" was the most common challenge touched upon, but "Busyness of Librarians" and "Busyness of Patron" also received many mentions in these chats. For example, librarians would pause and write, "Sorry for the delay, I had a patron at the desk while you were chatting." Patrons sometimes

mentioned challenges with "Access off Campus" and "Technical Issues" with library resources. More patrons had issues with "Too Many Results" when searching for resources than "Not Enough Results." The overall code group of "Challenges and Barriers" was the least coded theme.

Recommendations

The specific recommendations from people staffing chat were also coded. Databases were the most commonly advocated resource for patrons to use to search for research materials (in almost 77% of the chats analyzed), with CINAHL recommended the most often. The next most frequently mentioned research technique was for patrons to use filters to narrow down searching in databases or the library catalogue. Staff and librarians also encouraged the use of course and subject guides on nursing topics, and in a little over 18% of the chats, a one-on-on meeting with the liaison librarian was endorsed. Searching in the library journal finder or a specific nursing journal was never mentioned or promoted in these chats.
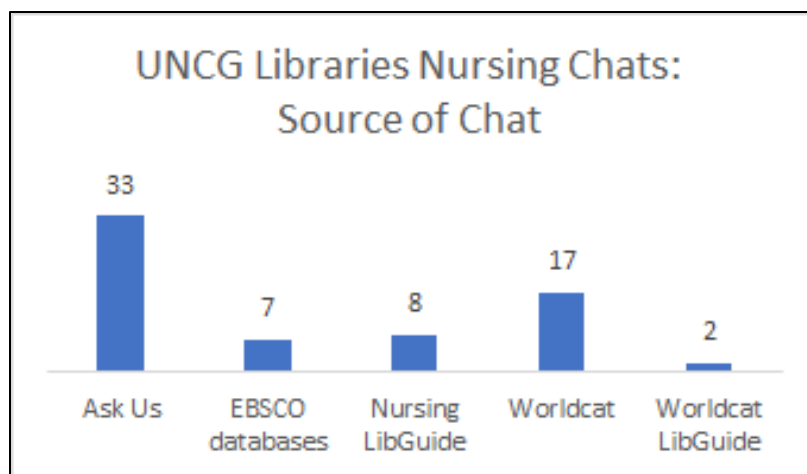
Figure 3
UNCG Libraries nursing chat chart depicting the source of the chat.

General Trends

The coding groups provided significant insight into nursing research needs. Additionally, the overall trends of the nursing chats are useful for improving chat services. The master spreadsheet of nursing chats includes chat source, time of chat, length of chat, whether the chat was transferred, type of patron and course (if mentioned), READ Scale, and description of the chat. The chats were received evenly throughout the day, with the afternoon being the slightly more popular time for patrons to chat (43%). Most chats came in from the Libraries Ask Us homepage, where the chat box is embedded within the Libraries home website (Figure 3). The second most popular source of chats was OCLC WorldCat (the library catalogue) and the third was the nursing subject guide. Chats that included mentions of a specific course were tagged; this illustrated that 57% of students did not mention a course when chatting in with a research need. People staffing chat can choose to rate the difficulty level of each chat using the READ Scale. With the chats we analyzed, many did not have READ scale ratings; of those that did get a rating, the most common rating was 3. At UNCG Libraries, READ Scale 3 means reference interactions such as finding books or DVDs in the catalogue by title or author (i.e., "I need to find Toni Morrison's Beloved"); accessing research guides; accessing subject databases; and basic citation style questions that can be answered using online citation style guides.

Discussion

Evaluating Nursing Chat Transcripts

Reference themes proved valuable in the coding analysis. "Busyness of Librarians" and "Busyness of Nursing Students" were commonly coded; this shows the importance of offering a variety of virtual reference services, such as online learning objects, chat, and virtual consultations. Within the "Recommendation" coding groups, not many library staff asked for a course number from chat patrons. While this could mean that a reference need was as simple as asking for a PDF of an article or that the chat staff was pressed for time, clarifying if there is a course number or assignment involved enables staff to better market course-specific research guides with relevant tutorials, links to databases, and applicable contact information. Librarians staffing chat should consistently offer detailed resource navigation instructions, as well as follow up information directing patrons to the nursing research guide and librarian. This

is a particularly useful approach at a university where health science is in the general education curriculum and is part of the strategic plan, enabling library chat staff to quickly and confidently fulfil the research need and move on to handle the next reference interaction. Since librarians working chat are often multi-tasking by handling more than one chat or by talking to patrons at the physical reference desk, it is vital for a library department to also create training to boost confidence with answering nursing research questions.

A frequently coded topic was the need for help with identifying keywords for searching in databases, which confirms the high prevalence of patrons searching for "known items." Highlighting the value of using library nursing and allied health databases and the catalogue is always integral during library information literacy instruction; this data shows the need to better showcase the differences between library resources and tools like Google Scholar (paywalls, lack of evaluation of quality of journals, insufficient search filters) within nursing and library online learning objects, instruction, consultations, webcasts, and orientations.

When helping patrons look for research articles, the health database CINAHL was usually recommended. Though CINAHL is a great solution for finding health science and nursing articles, there are many other databases that can direct patrons to research resources, including PubMed which has different search functionality. Throughout the transcripts, patrons consistently mentioned using PubMed. For example, a patron wrote "I'm looking for a full text scientific article through the journal: Current Medicinal Chemistry. What's the best way to get a full text? I have links to the PubMed and NCBI page but can't find the PDF of the article." Librarians staffing chat need to be able to quickly navigate between different types of databases to better serve nursing patrons.

Training on Nursing Research

This chat coding project shows that nursing patrons need assistance finding full-text clinical studies and articles, while also understanding the different nursing and allied health library databases. When informally surveying library staff about nursing chat training needs, one library staff chat member stated the desire for training on "more information about PubMed. I often recommend CINAHL because it's what I know the most. I've used PubMed in the past and know the overall gist, but some more details about advanced searching, how the database works, would be great." Based on this chat analysis and the needs of librarians working chat, follow up training sessions were created and administered by the health science librarians.

The trainings created were presented to the UNCG Library and Information Science (LIS) interns, with other chat staff and liaison librarians invited to participate. These training sessions about health science research and resources have now been offered every academic year since 2018, for a total of three workshops. Topics covered include recognizing research articles in the context of health sciences (primary research and types of research studies), evidence based practice, PICO, health science databases PubMed and CINAHL, and chat practice. The workshop generally ends with chat exercises from transcripts pulled from this study, and the attendees answer them on Google Forms or Google Docs within a Think, Pair, Share or group discussion format. When these workshops were assessed, LIS interns reported that these nursing chat and research workshops were helpful in reducing their anxiety about answering health science reference questions.

Reviewing Nursing Online Learning Objects

This study created an opportunity for immediate action for chat staff training, which

was planned and performed. It also prompted review of the nursing research guides, so that busy nursing patrons and chat staff can more quickly find relevant information and resources. Since this study, the Libraries ROI department has also revamped their suite of information literacy research tutorials.

This in-depth study of the needs of nursing patrons therefore helps to inform the need for more health science-related online learning objects and tutorials, as well as more online support on general topics such as finding full-text, locating permalinks, navigating the library website, and using the library catalogue and databases. Since this study, many nursing research online learning objects have been added to help train librarians, faculty, and students on concepts such as advanced searching in CINAHL, PubMed basics, the new PubMed interface, evaluating health sources online, and predatory journals.

Future Directions

Qualitative research studies involve limitations, including differing interpretations and errors that can happen with a large amount of data which takes a long time to code and analyze. The methodology of this study was challenging because of its time-consuming nature, but it was useful as an in-depth examination of the reference needs of a specific patron population. A similar study could be designed looking at different academic subjects or themes that feature in the Libraries' general chat interactions, such as e-books, interlibrary loans, and streaming. A variation on this study would be to apply the same methodology to recordings of nursing student consultations. Another continuation of this study would be to survey the patron population alongside a chat analysis. Since this study was performed, the online learning librarian at UNCG has interviewed students studying online about their overall information retrieval and research needs. A similar approach could be taken with nursing

students based on this study, to further identify their specific and diverse research needs. Another future study could encompass pretesting and posttesting to gauge whether nursing students' research knowledge improves via long reference chat sessions.

Starting in March 2020, due to the COVID-19 pandemic many of the library personnel who staff the chat service are working from home. Additionally, LIS interns no longer staffed the chat in Summer 2020. Based on this shift in the academic workflow, there have been several virtual professional development workshops. The nursing librarian performed multiple sessions on finding trustworthy health information online during COVID-19. This virtual workshop model could be adapted based on assessment from current programming to help LIS interns and librarians staffing chat.

Conclusion

Though time-intensive, this study on library chat transcripts shows the diversity of needs of nursing patrons, which included a large population of non-traditional and distance students. An in-depth examination of nursing chats led to a series of workshops and trainings for library chat staff and LIS students on nursing research, while also helping library personnel develop more tutorials and online learning objects on health information literacy. Improving the vital online service of chats through training on nursing research, evidence based practice, PICO, and specific health databases creates a better research environment for all patrons and librarians. This study will continue to help the libraries improve and expand workshops into the virtual realm, supporting library employees and patrons during the COVID-19 pandemic. Virtual reference chat is not going away; in the current academic environment it is needed more than ever. Studying library chats beyond basic use statistics may reduce library chat staff anxiety and prepare them to better serve patrons.

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