

The role of health librarian as a knowledge manager in data managing cycle:

An exploratory study in health Colleges' Libraries

At University of Dammam

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Abstract:

This study aims to answer the following questions: what changes will occur on the role of health librarian when becomes a knowledge manager within the data management in the academia? How the changes of this role represent an added value to the faculty's scientific outcomes in health colleges' libraries and their perceptions towards health librarian as well? To answer these questions, this study tracks and discusses the changes of role and responsibilities of the health librarian at 5 health colleges libraries at university of Dammam, Saudi Arabia when works as a knowledge manager and the reflection of this on the data managing concept. Methods: A series of individual and group interviews with faculty members has been conducted by the author as a librarian to provide guidelines of data management, citing and preservation. An online survey instrument is also used to collect data spontaneously and quickly. Faculty has been selected as the initial stakeholder to study because of their important influence in the academia. She helped three faculties in writing their own data management plan as well. Findings: This exploratory study has shown many benefits for UD medical and health faculty members. These benefits required change of the role of the health librarian from just providing library services and fulfill their informational need to act as knowledge manager within the data managing cycle. Another result shows that understanding data management concept and process from faculty member's side has influenced their data storage and preservation and fostered their behavior of sharing research data. The noticeable change of health librarian's role requires intensive training and continuous learning to improve his/her skills and qualifications to support faculty's needs in their research activities related to data management.

Keywords: Saudi Arabia, University libraries, University of Dammam, Data management, Data Management Plan-DMP, Knowledge manager, health librarian, Academic staff.

I. Background:

The Data management new concept among researchers has created new opportunities for academic libraries to extend their role to not just to provide access to the outcomes of researchers work and efforts to actually organizing and providing access to their research data within all phases of their research work. In literature, there are different definitions for data management in the literature, such as "data management comprises all the disciplines related to managing data as a valuable resource" (Wikimedia Foundation Inc., 2014). Another is to "control the information generated during a research project" (Penn state university libraries, 2013). After reviewing other definitions, this study has adapted a data management definition as "all processes related to collected data during any research phases, including planning, analysis, access, storage, citing and preservation".

Research Data Service-RDS in libraries is one of these roles. It is defined as "service that address the full data lifecycle, including the data management plan, digital curation (selection, preservation, maintenance, and archiving), and metadata creation and conversion" (Carol Tenopir, 2013, p. 70) . This data cycle implies an environment which adapts data process, distribution management for discovery and repurposing. The following figure clarifies this cycle.

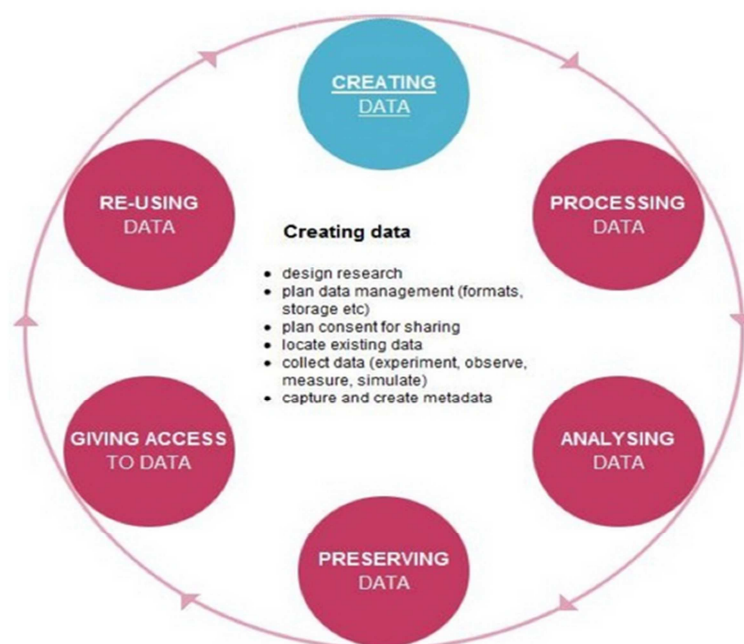


Figure no.(1) data life cycle

Source: (Libraries B. U., 2014)

Libraries' role within this cycle is making the data reusable through other researchers within all research phases and that what makes it challenging.

No doubt that the old traditional image of the librarian who is focused on providing access to information in different formats has changed over years. The new role for librarian within the data management cycle requires not just to provide the traditional library services, but also to work with faculty and researchers at each step of their researches, from forming project concept and grant seeking to final publication, providing expert guidance on data management and preservation, biometric analysis, expert searching and other data management-related areas. (Federer, 2013, pp. 298).

Health sciences librarians are continuously playing an important educational role in both academic libraries and in hospitals. Their role has changed due to influences of new educational models and technology growth. This educational role is represented in many responsibilities starting from providing access to medical information resources to promoting information literacy of medical faculty members and students through teaching use of electronic library resources as a mean to manage information (Jocelyn A. Rankinand, Summer 1993, p. 45). Recently health librarian has played another role which is "The subject librarian" who provides deep knowledge in specific discipline which will serve researchers and fulfill their informational needs. This new role required from the librarian to be available at the site where patrons conduct their work or need access to information, such as in a hospital, clinic, or research laboratory; and have academic training or specialized knowledge of their patrons' fields of practice or research. (Federer, 2013, pp. 298, 299). Moreover Health librarians have performed different activities and role such as "public health informationist", "systematic review librarian", "continuing medical education librarian", "grants development librarian" and "data management librarian" (Diane Cooper, 2013, p. 268).

Another concept invaded the library world which is "knowledge management". This concept has risen in business during the end of 20th century, and then spreads to other areas including libraries (Patrick Alfred, 2012). Because librarians were expert in searching skills, organizing, preserving information resources, they became stakeholders of the concept. According to Jennifer Rowley's definition of Knowledge management (Rowley, 1999) includes managing both tacit and explicit knowledge. It requires process of creating, sharing and maintenance of knowledge in digital repositories. These process were similar to those for librarians, therefore they called themselves knowledge managers. Sheila and Peter (Sheila Pantry, 2003) have discussed this point as they indicated that there is a "tendency" among librarians to adapt new titles regardless the functions that actually done or need to do. Their study concluded that there are common skills both librarians and knowledge managers are sharing such as selecting, collecting and distrusting information and knowledge and relating these skills to their users to actually use knowledge

effectively. Studies specified different responsibilities of the knowledge manager, such as: (Denning, 2009) (Juliet Aders, 2014)

1. Promote knowledge sharing by strengthening links between knowledge sources and information systems.
2. Help to improve the development of knowledge management.
3. Create collaborative tools to facilitate sharing of ideas among researchers.
4. Plan and develop a knowledge management strategy in order to create a good environment to share experiences across communities of research.
5. Establish a knowledge repository.
6. Providing ongoing training and support relating to the knowledge management systems and its uses.

From the above, the author of this study took the initiative to explore the changing role of health librarian in University of Dammam when act as a knowledge manager especially with the lack of studies discussing data management in librarianship in the Arab libraries. This study aims to answer the following questions:

1. What changes will occur on the role of health librarian when becomes a knowledge manager within the data managing cycle in the academia?
2. How the changes of this role represent an added value to the faculty's scientific outcomes in health colleges' libraries and their perceptions towards health librarian as well?

The next section reviews the literature that formed the background to the present study and the design of the research instrument. The subsequent section explains the design of the study and composition of the sample, followed by presentation of the main findings and observations. The conclusion then summarizes key findings and suggests lines of inquiry for future work.

II. Literature review:

The author has used different keywords and search strategies to identify literature related to the point of this study. Summon discovery was the main tool to search in most Dammam University databases simultaneously. Results were retrieved from Library, Information Science & Technology Abstracts (LISTA), ProQuest Nursing & Allied Health Source and Emerald Management. Google scholar was used to retrieve other web free resources. The following are the main studies as they revolve around the following points:

II.1. Discovering needs and changing role of the academic library:

In 2008, Council of library and information resources, Washington DC., has discussed the shift of academic libraries' role from just providing access to information into data curation as a result of the increase of digital publishing. This increase is followed by an increase of need to more digital scholarly resources so librarians should play an important role in linking between learning communities, content creators and publishers (Resources, 2008). Therefore, academic libraries has started to get in touch with researchers needs for assessment in order to find a way to serve fulfill those needs such as: Christie and Anita, University of Houston

(Dryden, 2011) who has conducted a study to assess data management needs and whether those needs were met to determine the role of library in this process as they found out that researchers needed help with several areas such as funding agencies and storage capacity. Similarly, another case study (Wang, 2013) in John Cotton Dana Library at Rutgers, the State University of New Jersey, Newark campus aimed to understand users' data needs to create guidelines for libraries to follow. One of the important finding of this study indicates that faculty members or student probably need the librarians as "research partners" to provide help for their specific data problems and data librarians can provide awareness through workshops and education to improve "better research habits" among researchers. Colorado State University librarians have conducted five focus groups with 31 faculty, research scientists, and research associates. This study has revealed important points related to the nature of data sets, how their data has managed, their needs to sharing, curating (Merinda McLure, 2014). The researcher sees that this phase was essential for academic research libraries to plan well for its' new role or the new library services called Research Data Service-RDS.

II.2. Research Data Services-RDS and librarians:

Large scale of academic libraries started to provide RDS for their researchers. Purdue University Libraries (Purdue university, 2013) has established a Research Data Service Hub called "Purdue university research repository-PURR" that helps researches in the university with updated information in writing data management plans especially for NSF funding agency requirements in research proposals. Similarly, University of California, Los Angeles -UCLA Library has dedicated a special webpage for data management to help university researchers to identify grant requirements in addition to some tools and guidelines for data management plan writing with focus on intellectual property issues with examples of research data repositories. (UCLA library, 2014). Moreover, Massachusetts Institute of Technology-MIT established a powerful tool with all detailed information about data management with workshops for researchers to promote their skills in research data management based on the research group which established in 2002. (Libraries M. , 2013).

Studies were conducted to investigate the readiness of academic librarians for providing Research Data Services-RDS. One of the important studies was conducted by Carol (Carol Tenopir, 2013, p. 70) who investigated the practices of RDS among ARL librarians in US and Canadian academic research libraries with focus on how librarians were ready to provide such services in terms of their backgrounds, skills, and education. Carol indicated that nearly three-quarters of the ARL sample librarians do not have research data services as "an integral part of their job responsibilities". She also found that many of them were sure that they have the knowledge and skills to provide such service in the future. Their attitudes have indicated their belief with RDS as an important service for academic research libraries to provide.

On the other hand, a large scale survey study on 140 libraries in New Zealand, Ireland, United Kingdom and Australia (Waseem, 2013) has indicated low levels of

data management engagement in comparison to bibliometrics services from majority of participated academic libraries with willing to increase their engagement in the future for the RDS with a focus on data management professional education. The study team found that librarians need a "multilayered understanding" of the research process.

This phase proves that Research Data Service-RDS is still in its early stage and needs more time to development from the librarian's perspective. They need to identify the research environment and train themselves to required knowledge and skills.

II.3. Data sharing and management in health Libraries:

In 2003, early efforts were made by the National institutes of health-NIH. It established guidelines for implementation of data sharing policy and grant funding requirements for health sciences researchers (National Institutes of health-NIH, 2003). In the same year, Medical Library Association spotted the light on the role of expert searching in health sciences libraries (R., Jan. 2005). As a result, Ohio State University hired a librarian to determine the roles and duties to librarians in other health libraries in relation to support researchers.

With the rise of E-Sciences librarianship in 2007⁽¹⁾, health science libraries seek for more understanding for health research data management and relate that to health librarianship. A research project on health libraries in Australia ⁽²⁾ (Cheek F. M., 2010) shed the light on the basic requirements for the health librarians workforce in Australia by producing surveys of Australian health data and health library managers. The outcomes of this projects explained "modular framework" for postgraduate qualifications in health librarianship.

Another field study (Cheek P. S., 2010) surveyed 136 academic health sciences libraries in US and Canada, who are also members in Association of Academic Health Sciences Libraries (AAHSL) to identify all possible ways to support health researchers. The study showed that "the library did provide some type of support" with different high degrees of importance. Diane cooper (Diane Cooper, October 2013) identified, traced and documented the new health sciences librarian activities and roles through her literature search within the period from 1990–2012. Examples of the new roles for health librarians were: embedded librarians (such as clinical informationist, bioinformationist, public health informationist, disaster information specialist).

From the above, health libraries started to get involved with health researcher earlier than other libraries. However, they need more time to form a complete image of how data management services should be provided for health researchers.

No Arabic studies discussed RDS in general or focused on health libraries. The main Arabic library literature tool (Abdelhady, 2008-2009)⁽³⁾ was used in this search until 2009. Other Arabic web resources were used to cover the remaining years as well.

¹ It was first introduced by Association of Research Libraries-ARL in its report (E-Science-ARL, 2007). It was defined by tony and Jessica hey as "shorthand for the set of tools and technologies required to support collaborative, networked science". (Hey, 2006).

² Health libraries in Australia are a group from the Australian library and information association.

³ This Arabic tool is similar to Library literature as it covers all published Arabic studies in library and information science since 1976 till 2009.

III. Research design:

Given the exploratory nature of the research, this study is seeking to understand the changes of role and responsibilities of the health librarian at four health colleges libraries at University of Dammam-UD, Saudi Arabia⁽⁴⁾ when works as a knowledge manager and the reflection of this on the data managing cycle, a survey method administered in the form of a questionnaire was selected as an appropriate strategy (Pickard, 2007). With a questionnaire, data can be collected spontaneously and quickly, which was particularly important to obtain and share usable results. This survey instrument⁽⁵⁾ is distributed online to enable the author to approach responses of health and medical faculty members to elicit exploratory data about what UD faculty members understand and think about data management as an important process for their research work and relate it as a service presented by the academic health library. A series of individual and group interviews with faculty members has been conducted by the author as a librarian to provide guidelines of data management, citing and preservation. Moreover, some of them needed an introduction of the concept of data management including life cycle and the benefits of writing a data management plan-DMP especially with funding agencies. Faculty has been selected as the initial stakeholder to study because of their important influence in the academy. Three faculty members asked the author for her help, in writing their own data management plan and they expressed their need to have access to other researchers' "medical raw research data" in order for them to save time. That indicated a giant leap of health librarian's carrier and role to act as a knowledge manager according to Jennifer Rowley's definition (Rowley, 1999).

The questionnaire, reflecting the purpose and objectives of the study, was developed using information obtained from the literature on the subject. It was pilot tested with 7 faculty members in different health disciplines in University of Dammam and then modified in the light of feedback received from the pilot. The pilot confirmed that the questionnaire took no longer than five to seven minutes per participant to complete. It contained eleven questions, mainly multiple-choice, with text-boxes enabling respondents to give answers other than the pre-specified responses. The questionnaire was arranged in three main sections:

1. Personal information
2. Data Management knowledge
3. Role of Health Librarian.

The sample of faculty members was identified through University of Dammam librarian liaisons' lists obtained by the author. These lists includes health and medical faculty members contact information who are using the following 5 medical and health sciences libraries **Main Central Library, College of medicine library for females, King Fahd University Library-KFUH, College of Nursing library, Dental College library**⁽⁶⁾. The questionnaire was administered using the QuestionPro tool

⁴ Established in 5/9/2009 after separation from King Faiysal University. UD located in the Eastern Province and includes 19 colleges categorized into 4 groups: colleges of health, Arts and humanities, colleges of engineering and colleges of sciences and management. **Source:** http://www.ud.edu.sa/DU/en/about/about_ud/index.htm

⁵ Supplement no.1 Study survey.

⁶ The following link includes background information about these libraries:

and distributed in April - May 2014 via e-mail invitations that outlined the aims of the study and contained a link to the web-based survey instrument. Data management explanatory link was included too. An email messages were personally addressed to carefully targeted contacts in an effort to maximize the response rate. Non-respondents were sent personalized reminders during the second half of May 2014.

The survey was viewed by 131, 56 complete responses were received from the total of 563 potential respondents representing 9.9% of that total. The completion rate is 54% and the number of drop outs was 47 responses. The 56 valid and complete records were analyzed.

IV. Findings and observations

IV.1. Personal information

As shown in table no. 1, valid response rates varied between colleges: the highest response rates came from the college of Medicine recording 61% while the 30% response from the college of Applied Medical Sciences is half way of medical responses but it is still a good response. This apparent difference can be explained as medical UD faculty members are so active in research area either individual or research projects.

Table no.1 UD Faculty members' response rate by colleges

Name of College	No. of responses	Percentage
College of Medicine	34	61%
College of Applied Medical Sciences	17	30%
College of Nursing	3	5%
College of density	1	2%
College of Health Sciences	1	2%
Total	56	100%

Table no.2 shows number of Faculty members who optionally answered the affiliated department question for each college. As observed, college of medicine is also the highest response rate with the total of 74%, the College of Applied Medical Sciences with 19%, and finally the college of Nursing with 7%.

**Table no.2 University of Dammam
Affiliated Faculty members response rate by colleges**

College	Dept.	No. of responses	Percentage
College of Medicine dept. (7)	Pathology, hematology	7	18%
	Physiology	5	12%
	Medical Biochemistry	4	10%
	Obstetrics and gynecology	4	10%
	Internal medicine	3	7%
	Radiology	2	5%
	Anesthesia	1	2%

http://www.ud.edu.sa/DU/en/deanship/library_affairs/index.htm

⁷ Colleges of Medicine departments, University of Dammam:

http://www.ud.edu.sa/DU/en/colleges/col_health/col_medicine/COL_MEDICINE_DEPT_EN

	Anatomy	1	2%
	Family and community medicine	1	2%
	Microbiology	1	2%
	Orthopedics, orthopedic surgery Spine Surgery	1	2%
	Surgery, general and laparoscopic surgery	1	2%
College of Applied Medical Sciences	Environmental Health Dept.	3	7%
	Physical therapy	2	5%
	Health Information Management & Technology	2	5%
	Respiratory Care department	1	2%
College of Nursing	Nursing Education Department	3	7%
Total		42	100%

IV.2. Data Management knowledge:

A. UD Faculty members' Data Management knowledge:

Participants were asked about if they know data management plans and concept as a main component in their research work. As seen in figure no.(2) 55% of the respondents (31 responses) answered negatively while 45% (25 responses) has confirmed their knowledge of data management.

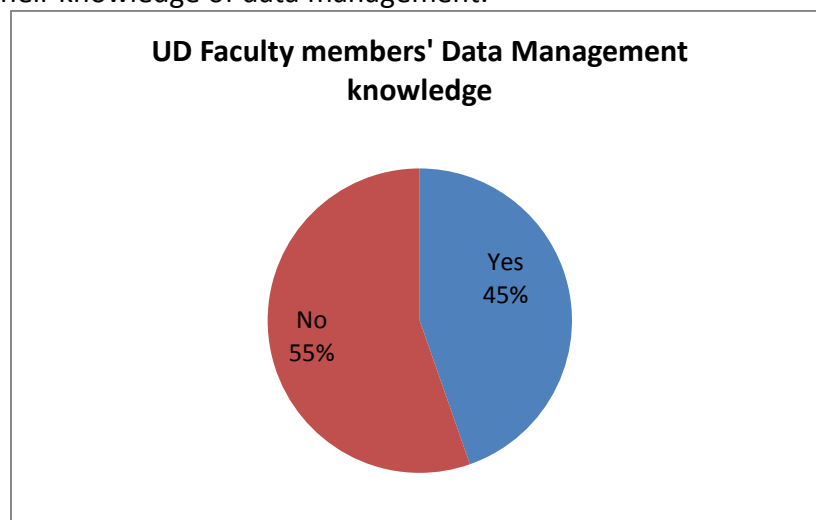


Figure no. (2)

Trying to track the reasons that lay behind the negative responses, respondents were asked optionally to clarify reasons; they have indicated different responses as shown in figure no.(3)

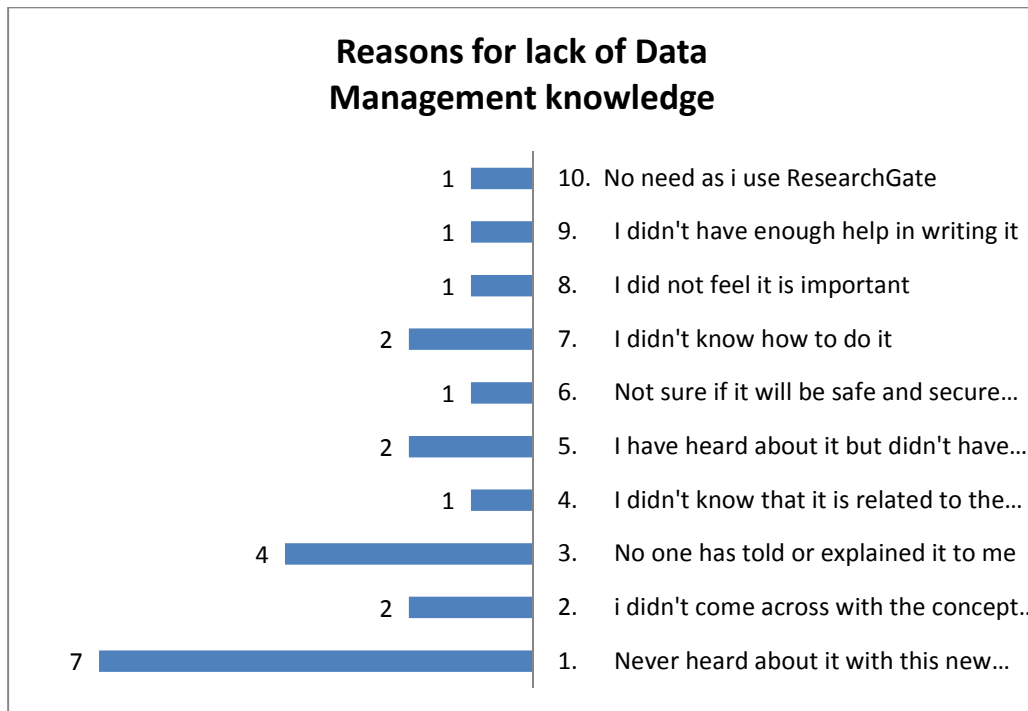


Figure no. (3)

Reasons from no.1 to no.4 (62%) indicated that UD faculty members in health and medical sciences had limited awareness of data management concept and life cycle and skills needed to develop a Data Management Plan-DMP even they perform many of its parts, which means more efforts in direction of data management services-RDS should be the main focus of UD health libraries in future. Reasons from no. 5 to no.9 (33%) indicated that respondents are in urgent need to conduct workshops and seminars with focus on some points:

- 1) Data management definition.
- 2) Research data life cycle
- 3) The importance of data management for research work especially for grant requirements.
- 4) Guidelines & tips and best practices on how to write a complete data management plan in relation to health and medical sciences.

Confirming the above, one of the respondents wrote the following comment *"Regular mandatory workshops need to be conducted in systematic way with departments chair arrangement"* which indicates the eagerness of UD faculty to know more about UD health libraries services.

The study interestingly found out that one of the participants is currently using research data medical repository tool named "ResearchGate"⁽⁸⁾ (the last reason 5%). That reflects two things: 1) UD faculty members are not aware of the distinctive role that the health library can play in their research work; 2) UD Faculty are using a free outside research data sharing tool because there is no data management repository for UD affiliates.

For respondents who have knowledge of Data management, they were asked whether if they wrote data management plan for their research. Figure no.(4) shows

⁸ <http://www.researchgate.net/>

that 64% of responses wrote their own data management plan for their research projects while 36% didn't write it.

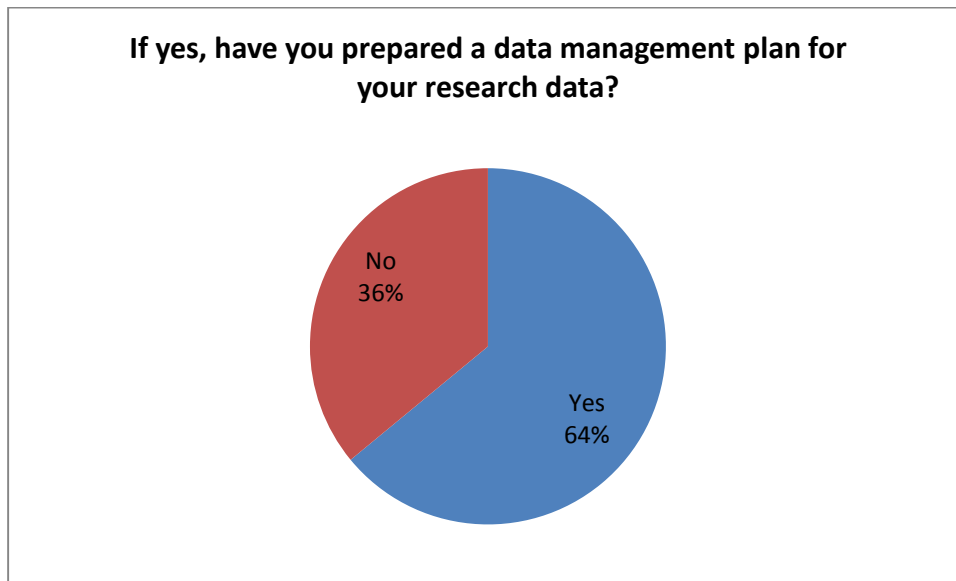


Figure no. (4)

Some faculty, during the interview, indicated uncertainty of either they wrote their own research data management plan correctly, hoping to have some help while writing it especially in metadata and data description part. These responses confirm the need to have RDS from health libraries and the importance of UD health librarian role in acting as a knowledge manager and act as a consultant for research projects conducted by faculty members, and may be part of the research team. It is important to mention here that during participants' interviews explaining data management concept, most of them (more than 90%) were surprised that librarians are playing new roles and becoming part of their research process and team. Most of them have clarified an overview of their research steps and data management practice to identify which area they need the librarians to have.

B. Responses of UD Faculty members after have been informed about the importance of Data Management knowledge:

Participants were given a multiple choice question to determine the importance of data management in their research work. A link for an explanatory Data Management Plan-DMP file was provided electronically to those who were not interviewed. As shown in figure no.(5) Save my time, Increases the visibility of my research, Preserve my data, and let me focus on research rather than worrying about how my data is housed or stored came at the top of the reasons that the respondents mentioned (total of 149 response, %59.13). This reflects the urgent need of UD faculty members for making their research work more visible and the need to save time and focus on their research and that emphasizes UD librarians to do more in this direction. Other reasons like: Supports scholarly communication, meet grant requirements came as the lowest of data management importance (total of 38 responses with 15% total) because University of Dammam currently dedicates high percent of its funds to support researchers in all areas including medicine and health. (Al-judi, 2014) However UD faculty members need to know more about the

essential role of data management in winning research grants. 29 responses (11.51%) have confirmed that data management is important to enable other researchers to use data to lead to new discovers. During interviews, she has touched some fear and discomfort of some UD faculty members to share their own research data as they would rather make their research data available on digital repository at the final stages of their research projects. The existence of this fear could be referred to the faculty's individual attitude of conducting their research work and their tendency to work alone rather than working in teams. This confirms the need for UD health librarians to work as knowledge manager in promoting knowledge sharing, creating collaborative tools to facilitate sharing of ideas among researchers and to establish a knowledge repository for health and medical researchers. In addition to provide support related to the knowledge management systems and its uses.

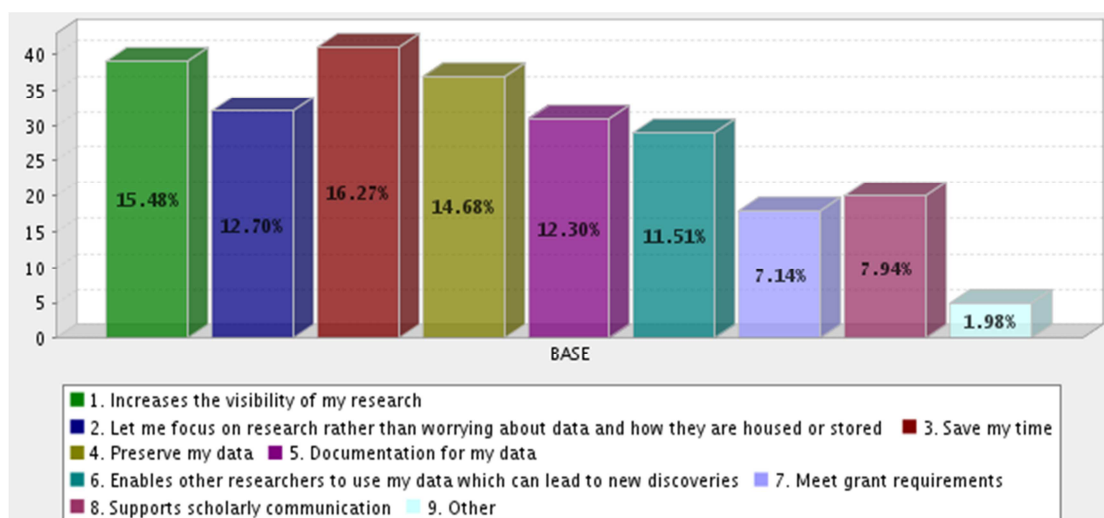


Figure no. (5)

Some participants mentioned other benefits of data management; two participants indicated that *"data management and research data repository is an excellent tool to guarantee the quality of data of the research outcomes"* while another two mentioned that data management *"enables collaborative research"*. The last statement confirms the earlier result related to UD faculty fear.

IV.3. Role of Health Librarian:

Fifty three (out of fifty six) of the respondents said that they need / or will need help in writing their data management plan as shown in figure no. (6), and certainly this percentage includes those who don't know about data management at all (more than 55%), and those who need don't have enough experience, time, skills to write a data management plan. So, there is high demand to develop systematic workshops and training courses for them to improve both awareness and skills in this regards.

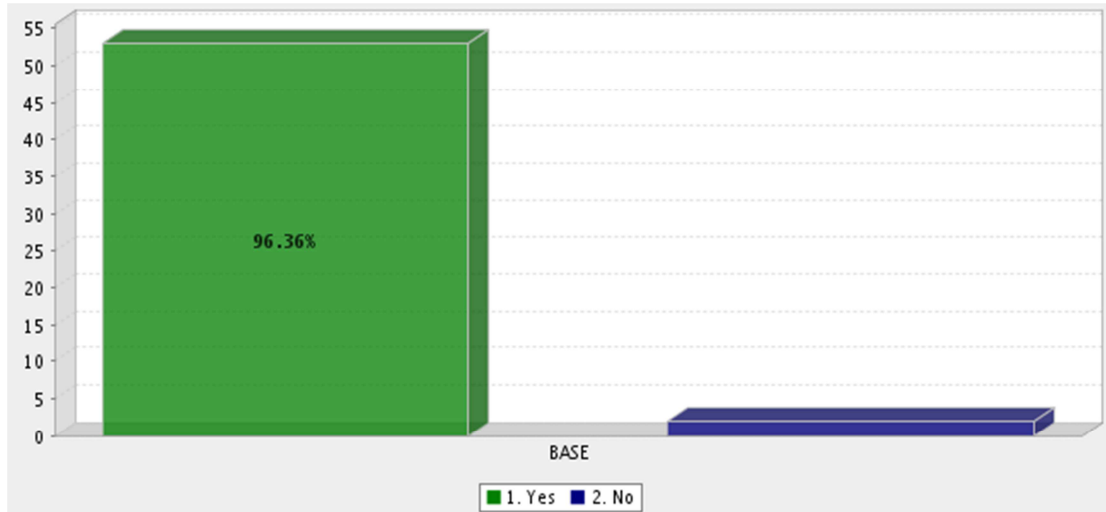


Figure no. (6)

Participants were asked about their preference for getting help in writing their research data management plan. As it shown in figure no. (7), the majority of the respondents will likely to seek help by reading about data management by searching UD libraries online resources (32.61%, 23.40%), then they will tend to ask for the health librarian's help. Some UD faculty members have doubts of the health librarian's skills and ability to provide help in this matter and when asked to clarify the reason, they indicated that may be because this is their first time to know the fact that librarians can provide research data services-RDS and be part of their research team and they having seen them doing this role before. Asking a faculty in the same department comes in the third priority which requires promoting the knowledge sharing attitude and cooperation as a part of the academic knowledge culture between UD faculty members. Ask a friend comes at the forth rank as they

If you needed help, who is the one you prefer to ask? Kindly rank the following (1 - 5) (1 means very important)

Average Rank		1	2	3	4	5				
1. A Faculty in the same dept.	2.54	[Bar chart showing distribution]								
2. Friends	3.38	[Bar chart showing distribution]								
3. Health librarian	2.40	[Bar chart showing distribution]								
4. UD Libraries online resources	2.24	[Bar chart showing distribution]								
5. Others (clarify)	4.04	[Bar chart showing distribution]								
Data Table										
1. A Faculty in the same dept.	13	28.26%	9	19.15%	15	32.61%	4	9.52%	5	17.86%
2. Friends	3	6.52%	6	12.77%	7	15.22%	24	57.14%	2	7.14%
3. Health librarian	12	26.09%	19	40.43%	7	15.22%	6	14.29%	4	14.29%
4. UD Libraries online resources	15	32.61%	11	23.40%	14	30.43%	6	14.29%	0	0.00%
5. Others (clarify)	3	6.52%	2	4.26%	3	6.52%	2	4.76%	17	60.71%

Figure no. (7)

The coming 4 figures (from 8 to 11) determine how far participants agreed on the following statements:

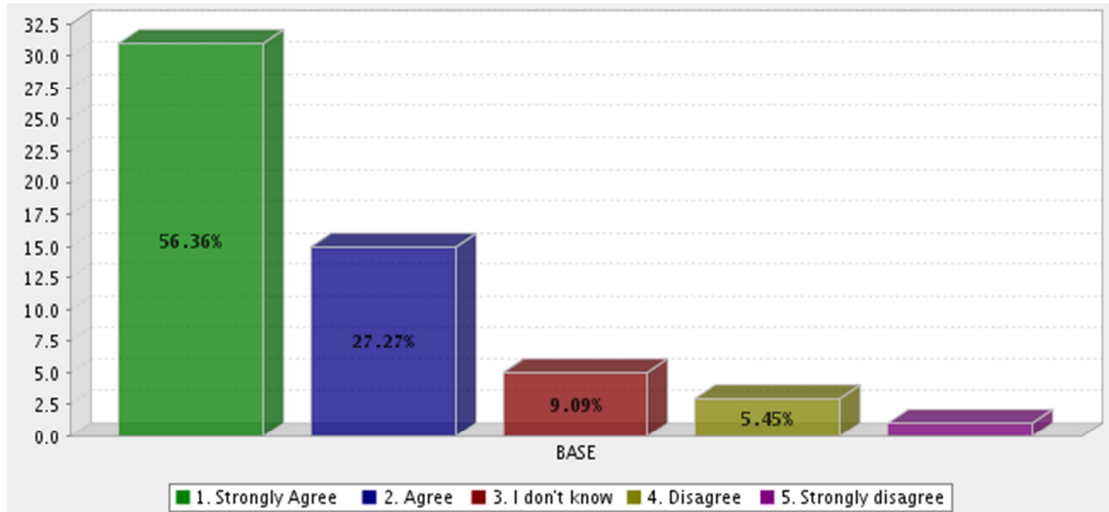


Figure no.(8)

Health Librarian should provide access to my research data in digital repository whenever i need it for my research and teaching

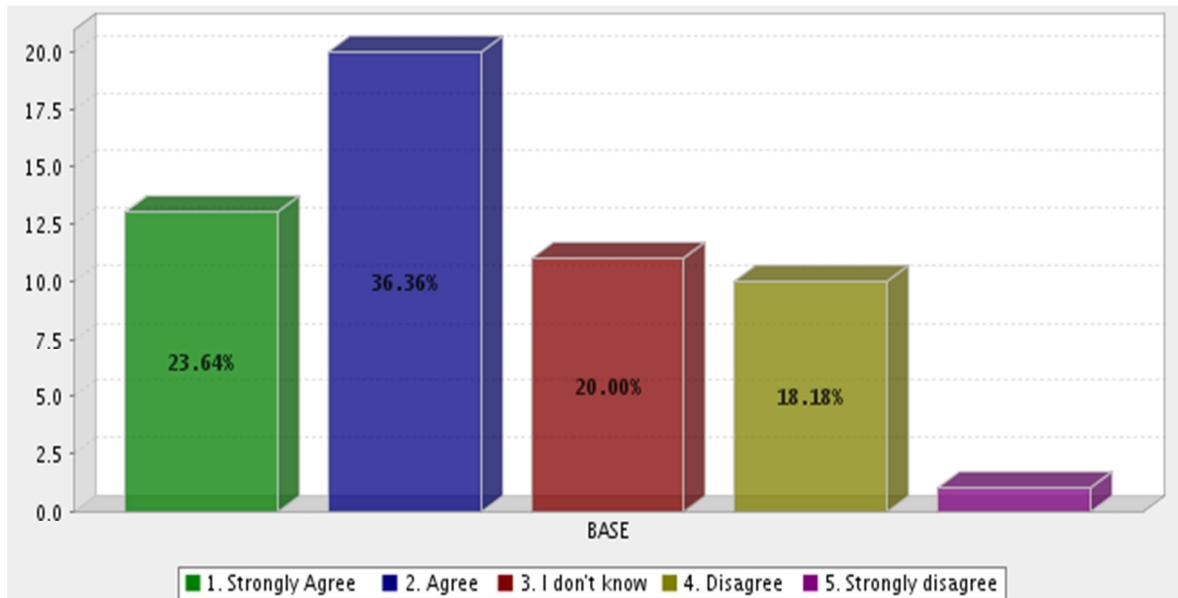


Figure no.(9)

Health Librarian should preserve my research data in a repository made available by my institution or another type of online repository

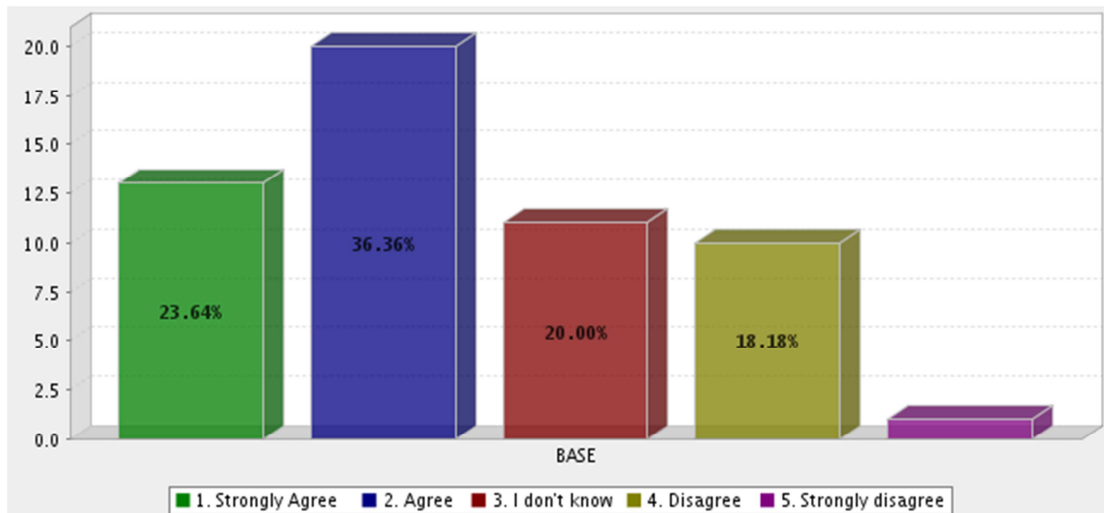


Figure no.(10)

Health Librarian can provide a great help in writing my research data management plan

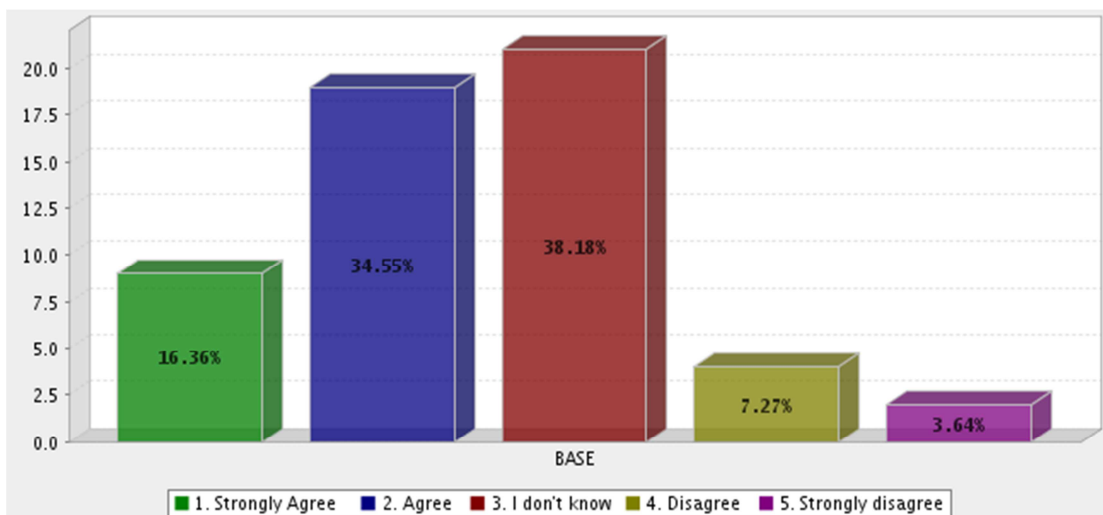


Figure no.(11)

I can depend on health librarian in writing my data management plan.

The majority of the respondents (strongly agree) on that Health Librarian should provide access to their research data in digital repository whenever they need it for their research and teaching, also the majority of the respondents (agree) on that health librarian to preserve their research data in a repository made available by their institution or another type of online repository, and there was an equivalent between the majority of the respondents who (agree) and those who (don't know) if the health librarian can provide a great help in writing their research data management plan or not. Finally, the majority of the respondent said that they (don't know) if they can depend on health librarian in writing their data management plans, and this is aligned with the earlier result that they don't likely to ask for his or her help.

Participants were asked to choose which area they think UD health librarian can provide assistance while writing data management plan. As shown in figure no.(12), both description of data to be collected and storage and data management Plans

come at the first place and this is reasonable because the needs that mentioned from them previously to get help in writing data management plan, especially that more than 62% of the respondents indicated that they had limited awareness of data management cycle and the concept of data management and skills needed to develop Data Management Plan-DMP, the in the second place access policies and provisions flowed by provisions for long-term archiving and preservation as both of them needed for understand the process of data curation and preservation, and related to it the next option which is legal and ethical issues. At the end come the following: Assigned data management responsibilities and project description. This is because they need more experience of the data management and more involvement with the health librarian which is not fully existence.

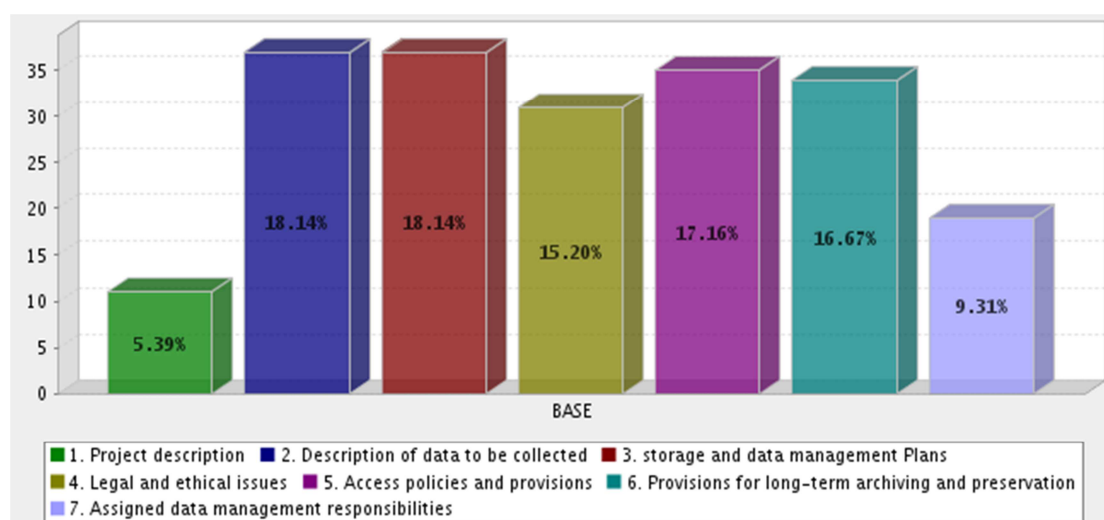


Figure no.(12)

V. conclusion:

This exploratory study has shown many benefits for UD medical and health faculty members. These benefits required change of the role of the health librarian from just providing library services and fulfill their informational need to act as knowledge manager within the data managing cycle. Thus, it is recommended that UD health librarian should perform the following:

1. Promote knowledge sharing for researchers.
2. Create collaborative tools to facilitate sharing of ideas among researchers.
3. Work as a consultant for research work conducted by faculty members or work as a part of the research team to promote data management curation process.
4. Due to UD faculty need for help in writing their research data management plan, they should provide advice on data management plans. This advice includes: metadata standards, preferable file format for preservation and preparation of data for sharing.
5. Establish a knowledge digital repository for UD health and medical researchers including research data in their area of interest.

6. Support knowledge management systems and its uses.
7. Provide access to research data in digital repository whenever faculty needs it for their research and teaching.

This Noticeable change of health librarians role requires intensive training and continuous learning to improve their skills and qualifications to support faculty's needs in their research activities related to data management.

Participants have limited awareness of data management concept & life cycle and knowledge needed to develop a Data Management Plan-DMP. Therefore, efforts in direction of data management services-RDS should be the main focus of UD health libraries. One of these efforts is to conduct trainings and workshops in the following areas:

- Data management: definition, importance for research work.
- Research data life cycle.
- Metadata, research data description and access policies.
- Provision for long- term archiving and preservation.
- Guidelines & tips for best practices on how to write a complete data management plan with a focus on health and medical sciences.

Research Data Services-RDS is essential for UD faculty and researchers in medical and health sciences for the following reasons:

1. They are actively working in medical research especially with the funding support provided by Dammam University.
2. They need to have their research work more visible and they need to save time for their research. RDS services will help them to locate, discover, shape, store, publish and cite the data which derived from their research.
3. They need to understand that data management supports scholarly communication and sharing research data and promote teamwork attitude as some of them have fear of sharing data.

Another finding shows that understanding data management concept from faculty member's side has influenced their idea about data management including storage, preservation and fostered their attitude of sharing research data. This represents an added value to the faculty's scientific outcomes in health colleges' libraries and their perceptions towards health librarian.

Future studies should be conducted with the same category of UD faculty members to plan and test the Research Data Services-RDS in UD libraries in light of this study.

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