ALqadisyiah university
collage of pharmacy

Ministry of high education
and scientific research

Evaluation of Iraqi pharmacists of their competence development in conducting pharmacy practice research

A research submitted to the college of Pharmacy of the requirements

For the degree of B. Sc. of Pharmacy

By

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Supervised By

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(وانزل الله عليك الكتاب والحكمة وعلمك ما لم تكن

تعلم وكان فضل الله عليك عظيماً)

Dedication

This Research is dedicated to my father, who taught me that the best kind of knowledge to have is that which is learned for its own sake , It's also dedicated to my mother, who taught me that even the largest task can be accomplished if it's done one step at a time+

Muslim&Mustafa

Acknowledgment

Thanks to Dr.MohsenAlrodhan who has been the ideal supervisor. His sage advice, insightful criticisms, andcontinuous encouragement aided the writing of this research in innumerable ways, I would also like to thank all of the o for the steadfast support for this project , A special thanks to Dr.Bassim Irheim the dean of the college

Muslim & Must

certification

This is certify that this research was prepared under my supervision at the university of AL-Qadisiyah ,collage of pharmacy, as a partial requirement for the degree of bachelor in pharmacy

signature;

advisors name;

date;

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Contents

Abstract

objective: research is essential to the advancement in evaluation pharmacy practice research. pharmacists have a pivotal role in play in the strategy however this study primarily aim to evaluate Iraqi pharmacists of their competence development in conducting pharmacy practice research.

method: a multi-centered survey using 105 questionnaire were distributed among the pharmacists in hospitals and pharmacies. there were 83 pharmacists responded on 35 questions that found in each questionnaire. both descriptive and inferential statistical analysis where applied by using SPSS version 17.

results: a total of 83 participants responded to questionnaire about 22%ofparticipant did not have any previous research experience while 78of participants have previous research A large proportion of pharmacists in Iraq conclusion ;self-assessed themselves as having deficiencies in several areas of research competencies, particularly in developing research protocols, critically appraising the literature, and applying the appropriate statistical techniques.

Introduction

Pharmacy practice, as an important component of healthcare, is rapidly evolving, and research is becoming essential to generate new knowledge for improving the therapeutic use of medicines and overall healthcare outcomes (Bond, 2006; Peterson et al., 2009; Kritikos et al., 2013). Research also serves as the bedrock for evidence-based pharmacy practice (Bond, 2006; Peterson et al., 2009). Therefore, having pharmacists who are competent in the delivery of pharmaceutical care and who possess the skills to conduct research is critical because their roles in direct patient care and research is rapidly advancing (Schwartz,1986; Hepler and Strand, 1990; Holland and Nimmo, 1999; Schumock et al., 2003; Bond, 2006; Dowling et al., 2009; Smith et al., 2009; Potomac et al., 2011). However, there is a lack of empirical evidence to demonstrate the parallel advancement of pharmacists in terms of capacity and involvement in health-related research activities. In spite of a societal need for pharmacist–researchers to advance pharmacy practice, establish new roles and services, and improve healthcare outcomes, some challenges exist that may hamper the attainment of these goals (Davies et al., 1993; Fagan et al., 2006; Saini et al., 2006; Armour et al., 2007; Peterson et al., 2009; Smith et al., 2009; Smith, 2010). These challenges include ensuring an adequately trained pharmacy workforce, obtaining research funds, and having protected time for research (Saini et al., 2006; Dowling et al., 2009; Peterson et al., 2009; Potomac et al., 2011). However, data about the ability and competence of hospital-based pharmacists on practice-related research have not been widely documented. It is also hard to quantify the research productivity of pharmacists in an environment where data are generally limited. Is theIraqi pharmacy workforce adequately trained and prepared to face the current challenges of and quest for cutting-edge health-related research? In an effort to determine where the pharmacy workforce lies in this equation, this study was conducted.

The aims of study :

(1) Explore the research backgrounds and productivity of pharmacists.

(2) Determine their self-reported competence and condensed towards conducting pharmacy practice and health-related research.

(3) Examine their preferences for training programs to build their research capacities and meet the future needs of the profession.

Literature review

As part of the mission and goals of pharmacy education, academic degree programs should provide sufficient exposure and prepare pharmacy graduates to conduct practice-based research and scholarly activities. Historically, a minority of undergraduate pharmacy degree programs included formal research education and training as requirements for graduation (Nahata, 2002; American College of Clinical Pharmacy Research Affairs Committee, 2007; Knapp et al., 2011). Furthermore, studies have shown that the number of individuals in the pharmacy workforce with demonstrated capacity for independent research is too small, the number of programs to train such individuals is too few, and the research output from pharmacists is generally too little (Schwartz, 1986; Davies et al., 1993; Ellerby et al., 1993; Rosenbloom et al., 2000; Nahata, 2002; Saini et al., 2006; Armour et al., 2007). In contrast, pharmacy schools and colleges have developed numerous postgraduate programs over the years to provide alternative training opportunities to help meet the needs of pharmacy graduates. Despite the increased awareness among pharmacists and other health care professionals about the preparations required to seek and succeed in a research career (Blouinet al., 2007; Dowling et al., 2009; Smith et al., 2009; Poloyacet al., 2011), few pharmacists, especially among those practicing in a busy hospital environment, have the opportunity to join formal graduate programs that boost research capacity. Moreover, previous studies have documented that community pharmacists are ill-equipped in terms of pharmacy practicerelated research skills and knowledge (Ellerby et al., 1993; Liddell, 1996; Rosen bloom et al., 2000; Saini et al., 2006; Armour et al., 2007; Peterson et al., 2009).However, data about the ability and competence of hospital-based pharmacists on practice-related research have not been widely documented. It is also hard to quantify the research productivity of hospital pharmacists in an environment where data are generally limited.

The field of pharmacy and pharmacotherapy are areas of rapid change, with new techniques, new product and new information about old product constantly being introduced. all health care professionals, Including pharmacists, are faced with the constant challenge. of new information, which they are required to filter, assimilate and use to improve their practice. medicines can be one of the most cost-effective interventions in health care systems in terms of alleviating pain, suffering and even preventing death .in addition, they can contribute to savings of limited health care resources, however, the marching practices used by many pharmaceutical companies make it very difficult to identify real improvement in the field of pharmaceuticals. it is therefore essential for pharmacists to understand and be able to use the tools of critical appraisal and cost effectiveness analysis as they evaluate the huge amount of information that reach them. they should also share their critical appraisals with other health careprofessionals ,notably prescribers. The techniques used have been incorporated in the emerging disciplines of evidence_based medicine/pharmacotherapy and pharmacy _economics.(Sackettetal. 2000)1.pharmacist provide professional services in variety of setting in response to local ,national and international needs and priorities. withfocus on populations and/or individual patients. Pharmaceutical public health includes services to populations such as local guidelines and treatment protocols, medicine use review and evaluation, national medicine policies and essential medicine lists, pharmacovigilance, needs assessment and pharmaco_epidemiolog.Pharmaceutical public health has been defined as the application of pharmaceutical knowledge ,skills and resources to the science and art of preventing disease, prolonging life ,promoting, protecting and improving health for all through the organized efforts of society.(Walker,2000), in constrict ,pharmaceutical care is delivered at the individual patient level this concept was first defined as:"the care that given patient required and receives which assures safe and rational drug usage"(Mikealet al.,1975)

Pharmaceutical care should be provided to all patients in receipt of pharmaceutical services .However, in practice this is not always possible due to limited recourses and pharmacist may have to prioritize particular patient in such situations. the term triage designates system where by a group of casualties or other patients is sorted according to the seriousness of their injuries or illness so that treatment priorities can be allocated between them. in emergency situations it is designed to maximize the number of survivors. Occasionally the pharmaceutical public health role may be in conflict with the pharmaceutical care role at individual patient level in a public health context pharmacist aim to do the greatest good for the greatest number of people, which may prejudice the care of an individual in resource limited setting. A systematic approach to the delivery of pharmaceutical care is set out involving the following four steps:step1:assess the patients drug therapy needs and identify actual and potential drug therapy problems.step2:develop a care plan to resolve and/or prevent the drug therapy proplems.step3:implement the care plan .step4:evalluate and review the care plan.(Hepler1990).pharmaceutical care is a prospective patient centered practice with a focus on identifying resolving and preventing drug therapy problems. this objective is achieved by patient care process comprising four steps. pharmacist require a high level of knowledge and skills to deliver pharmaceutical care and an organizational structure to facilitate its delivery. this structure must provide for there feral of patients who cannot be managed at particular level of care to a different level where optimal pharmaceutical care can be provided(Cipolle 1996). Ultimately, as patients benefit from appropriate drug therapy,is rapidly evolving, and research is becoming essential to generate

new knowledge for improving the therapeutic use of medicines and overall healthcare outcomes (Bond, 2006; Petersonet al., 2009; Kritikos et al., 2013)16. Research also serves as the bedrock for evidence-based pharmacy practice (Bond, 2006;

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Strand, 1990; Holland and Nimmo, 1999 Schumock et al., 2003; Bond, 2006; Dowling et al., 2009Smith et al., 2009; Poloyac et al., 2011)17. Likewise, pharmacy practice in many Middle Eastern countries is rapidly evolving (Kheir et al., 2009; Kheir and Fahey, 2011; Zaidaet al., 2011)18. However, there is a lack of empirical evidence to demonstrate the parallel advancement of pharmacists in termsof capacity and involvement in health-related research activities.In spite of a societal need for pharmacist–researchers to advance pharmacy practice, establish new roles and services,and improve healthcare outcomes, some challenges exist thatmay hamper the attainment of these goals (Davies et al.,1993; Fagan et al., 2006; Saint et al., 2006; Armor et al.,2007; Peterson et al., 2009; Smith et al., 2009; Smith, 2010)19.These challenges include ensuring an adequately trained pharmacy workforce, obtaining research funds, and having protected time for research (Saini et al., 2006; Dowling et al.,2009; Peterson et al., 2009; Poloyac et al., 2011)20.As part of the mission and goals of pharmacy education,academic degree programs should provide sufficient exposureand prepare pharmacy graduates to conduct practice-based research and scholarly activities. Historically, a minority of undergraduate pharmacy degree programs included formal research education and training as requirements for graduation (Nahata, 2002; American College of Clinical Pharmacy Research Affairs Committee, 2007; Knapp et al., 2011)21. Furthermore, studies have shown that the number of individuals in the pharmacy workforce with demonstrated capacity for independent research is too small, the number of programs to train such individuals is too few, and the research output from pharmacists is generally too little (Schwartz, 1986; Davies et al.1993; Ellerby et al., 1993; Rosen bloom et al., 2000; Nahata,2002; Saini et al., 2006; Armor et al., 2007)22. In contrast, pharmacy schools and colleges have developed numerous postgraduate programs over the years to provide alternative training opportunities to help meet the needs of pharmacy graduates. Despite the increased awareness among pharmacists and other health care professionals about the preparation required to seek and succeed in a research career (Blouinet al., 2007;

Dowling et al., 2009; Smith et al., 2009; Poloyacet al., 2011)23, few pharmacists, especially among those practicing in a busy hospital environment, have the opportunity to join formal graduate programs that boost research capacity.Moreover, previous studies have documented that community pharmacists are ill-equipped in terms of pharmacy particulate research skills and knowledge (Ellerby et al., 1993;Liddell, 1996; Rosenbloom et al., 2000; Saini et al., 2006;Armour et al., 2007; Peterson et al., 2009)24

Method

This was a cross-sectional study that used a revalidated, pre-tested study instrument. As this study was conducted to investigate the understanding of evaluation 0f Iraqi pharmacists of their competence development in competence in pharmacy practice research, all pharmacists were contacted. A total of 31 questionnaires were distributed to pharmacists in their pharmacy with the help of my colleague in the study, and 74 questionnaires were distributed to pharmacists whose work in the hospitals. The questionnaires were completed by the pharmacists and collected on the next week. the data were collected in October 2016. Of 125 questionnaires distributed, only 83 responses were successfully collected back.

The study instrument was a questionnaire which was formed on the basis of extensive literature search. The pilot data was entered in SPSS version 17 to evaluate the reliability coefficient. Reliability coefficient was found to be 0.85. Data was analyzed using SPSS version 17. Descriptive and inferential statistics were applied.

Study tool: design and development of questionnaire

The questionnaire contained 32 questions. It investigated five main areas:

- The participant's demographic information (5 questions): age, gender, education, number of years sent in pharmacy practice, currently working at hospital or community Parma
- research background and interests
- interest in research conducting
- interested in learning about conducting research
- 0verall ability to design and conduct research
- ability of pharmacists in planning and conducting research, theirare(17 questions)
- involvement in research as a subject respondent

- 05 involvement in research as principal investigator
- number of peer-reviewed articles published within the last 5 year
- number of peer-reviewed posters and/or abstracts in local regional conference since last 5 year.
- number of peer-reviewed poster and /or abstract in international conference since 5 years
- interest in postgraduate studies
- area of interest in pharmaceutical sciences
- area of interest in clinical pharmacy practice

Statistical analysis

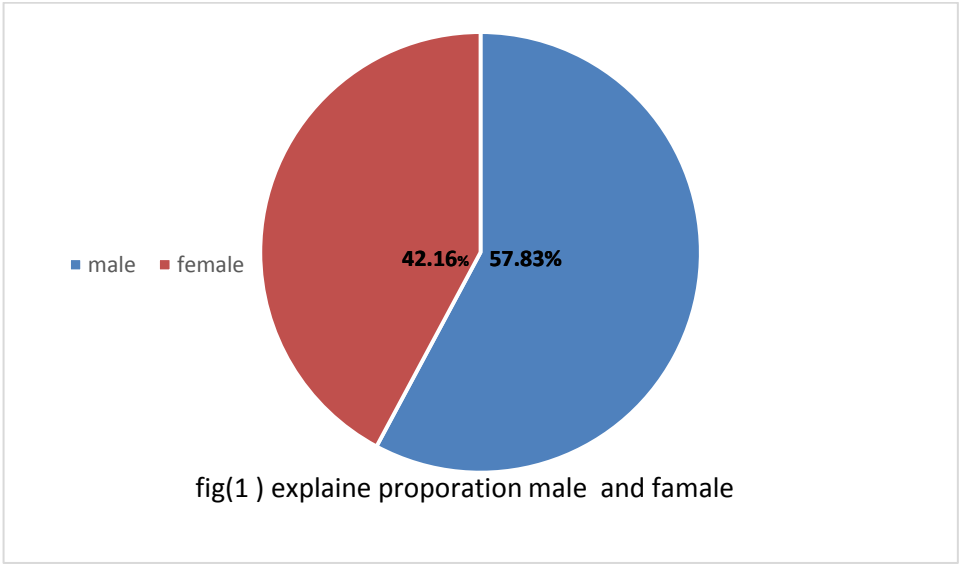
We used SPSS 17 to analyze data, using T-test method at level 0.05

Results

sample size and demography

The participants who agreed to answer the questionnaire in this study were 105 pharmacists ,there was response rate of 86 of 105 questionnaires three cases were excluded because there not answered by pharmacist the result of

the proportion of famle was 42.16%(35) while male equal to 57.83%(48) (fig 1)



fig(1) explaine proporation male and famale

the result of age 77%(64) was (25-35), 19%(16) was (35-45) and4%(3) was between45 to 55(fig 2)

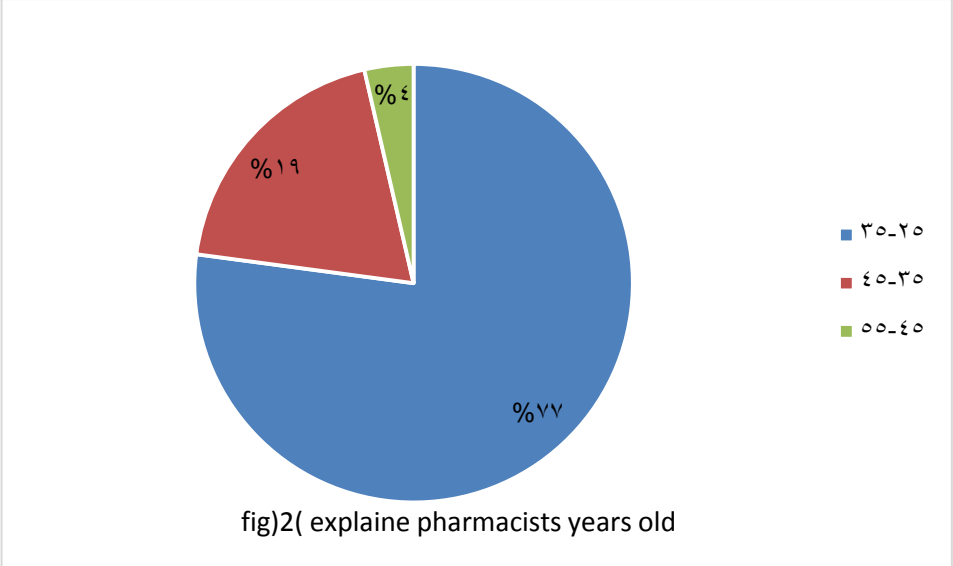
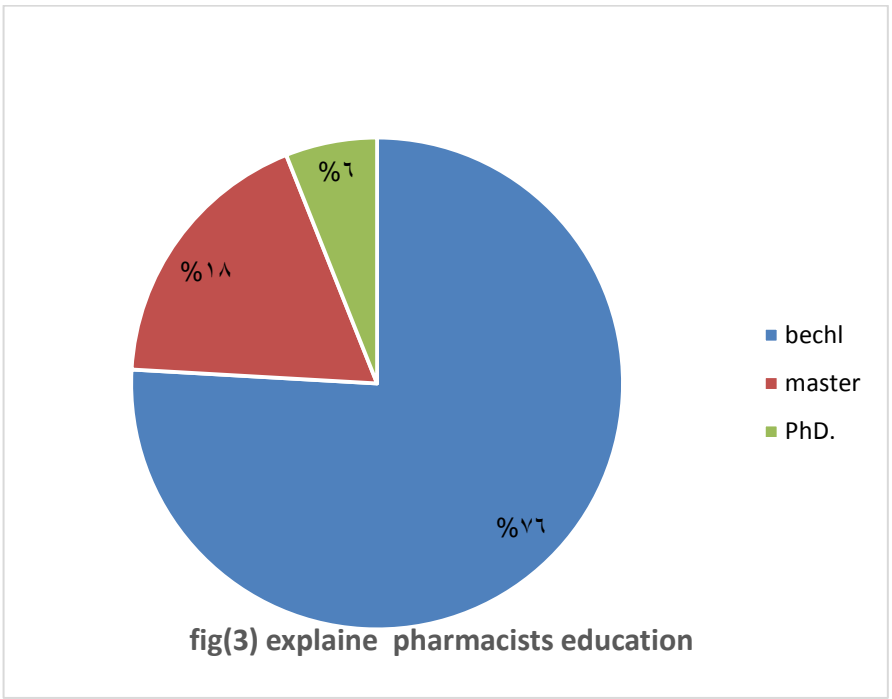


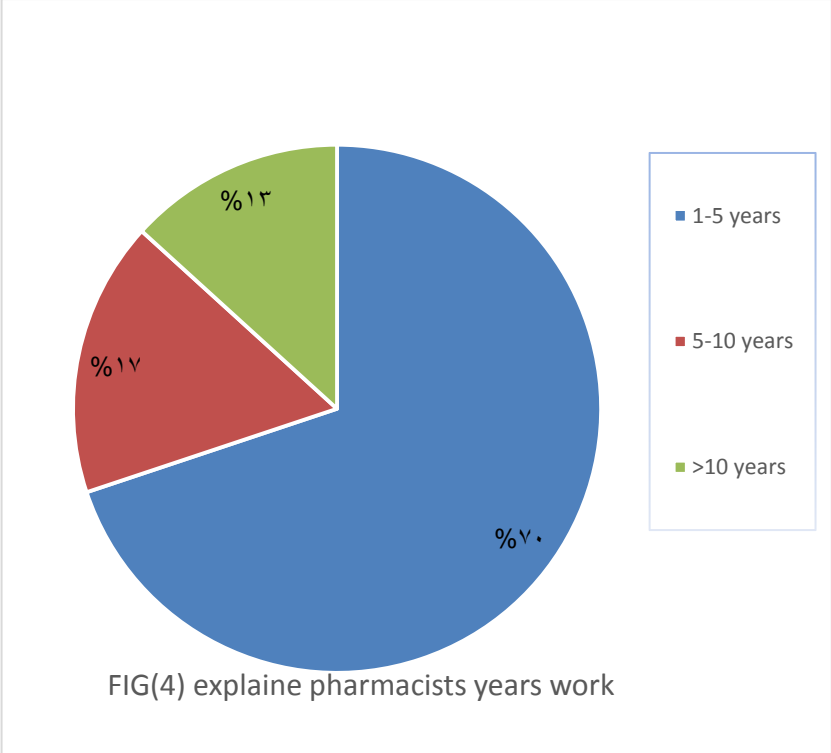
fig)2(explaine pharmacists years old

the result of education was 76%(63) are bachelors, 18%(15)are master and 6%(3) are PhD (fig 3)



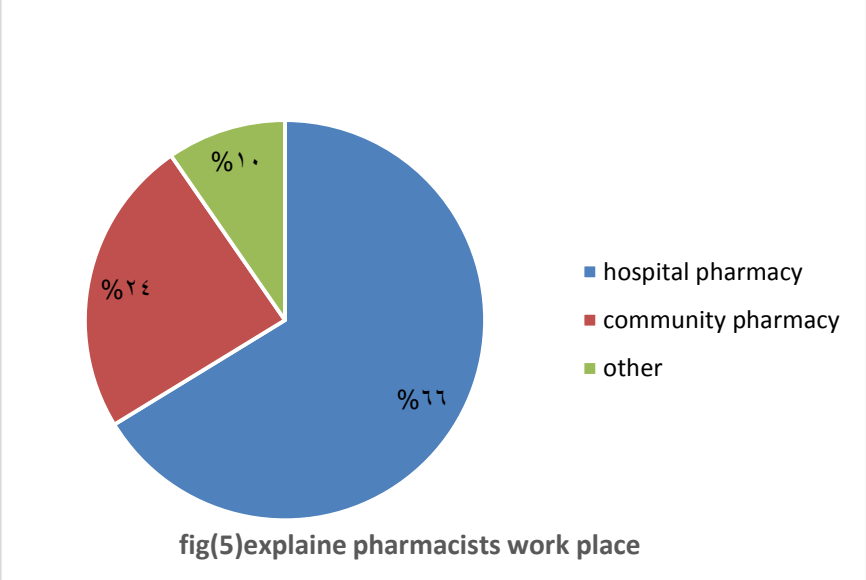
fig(3) explaine pharmacists education

the result of according work years were 70%(58) are (1-5)years , 17% (14)are (5-10) years and 13%(11) more than10 years (fig 4)



FIG(4) explaine pharmacists years work

according pharmacists work place 66%(55) in hospital pharmacy ,24%(20) in community pharmacy and 10%(8) in other (fig 5)



fig(5)explaine pharmacists work place

research background and interests

the result of according previous research the pharmacists answer (yes) were 65 and pharmacists answer(No)were 18 fig (6)

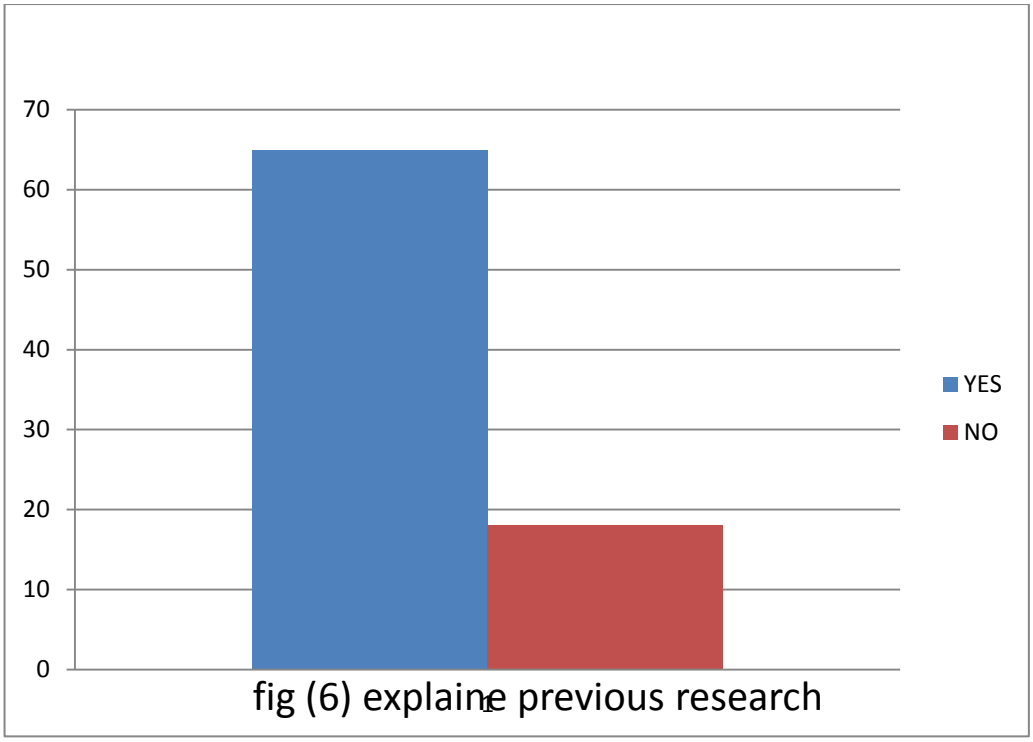


fig (6) explaine previous research

and the result of according previous research related training during undergraduate ,post graduate pharmacists answer(No training)10 , workshop 27, seminar 25, short course13 and other 8the p value was 0.013, significant see fig (7)

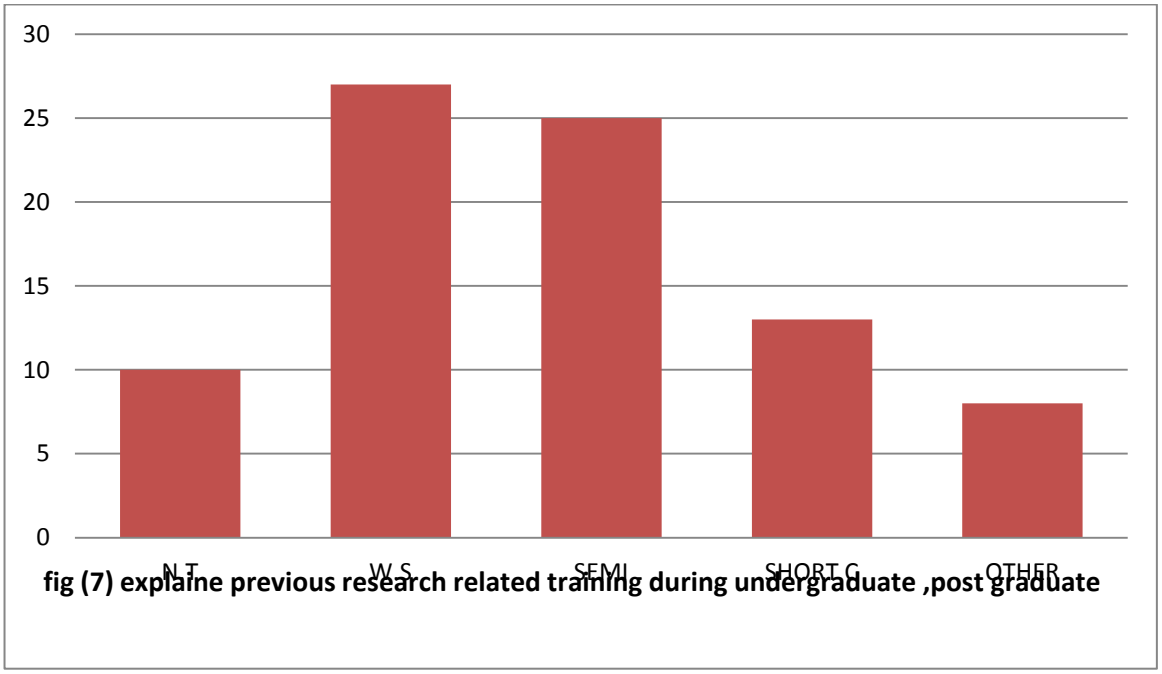


fig (7) explaine previous research related training during undergraduate ,post graduate

the result of interest in research conducting where no interested at all 4,not very interested 5,somewhatinterested 48,very interested 22 and extremely interested 4 the p value was 0.125,not significant fig (8)

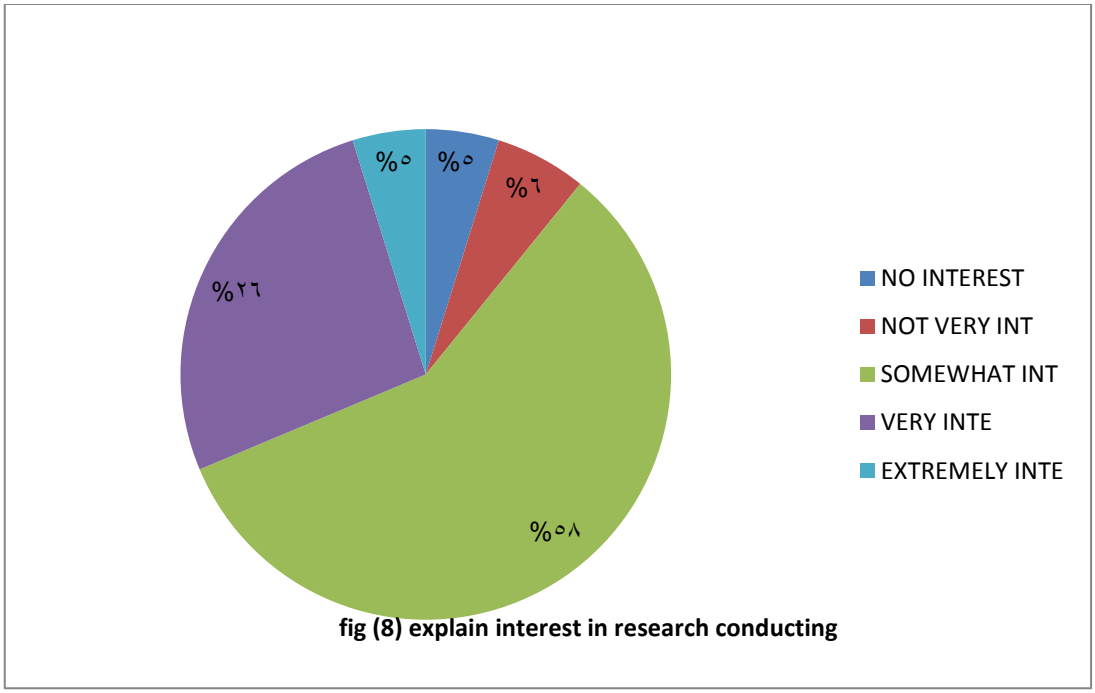
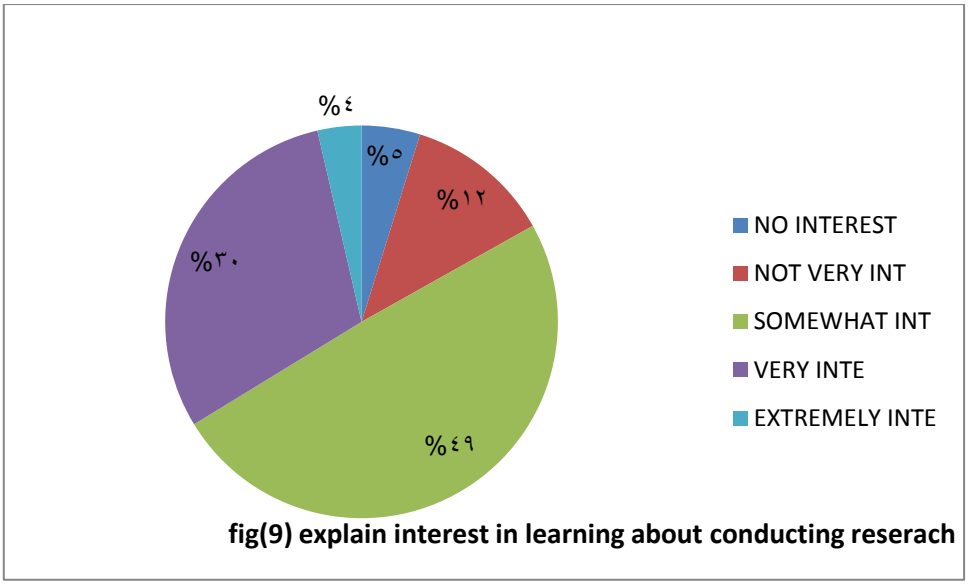


fig (8) explain interest in research conducting

the result of interested in learning about conducting research where no interested at all4,not very interested10,somewha i nterested41,very interested 25 and extremely interested 3 the p value was 0.084,not significant fig (9)



fig(9) explain interest in learning about conducting reserach

the result of overall ability to design and conduct research where 4(5%),17(20%),42(51%) ,19(23%)and 1(1%)0f poor,fair,good,very good and excellent ,respectively. the p value was 0.084,not significant see fig (10)

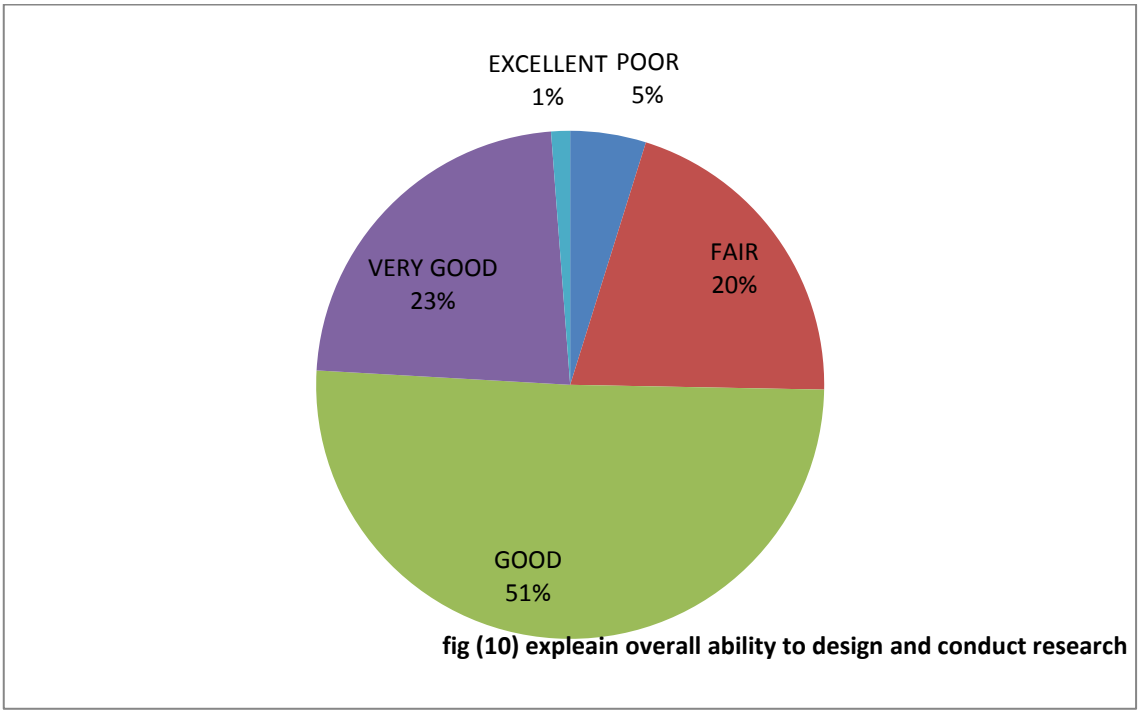
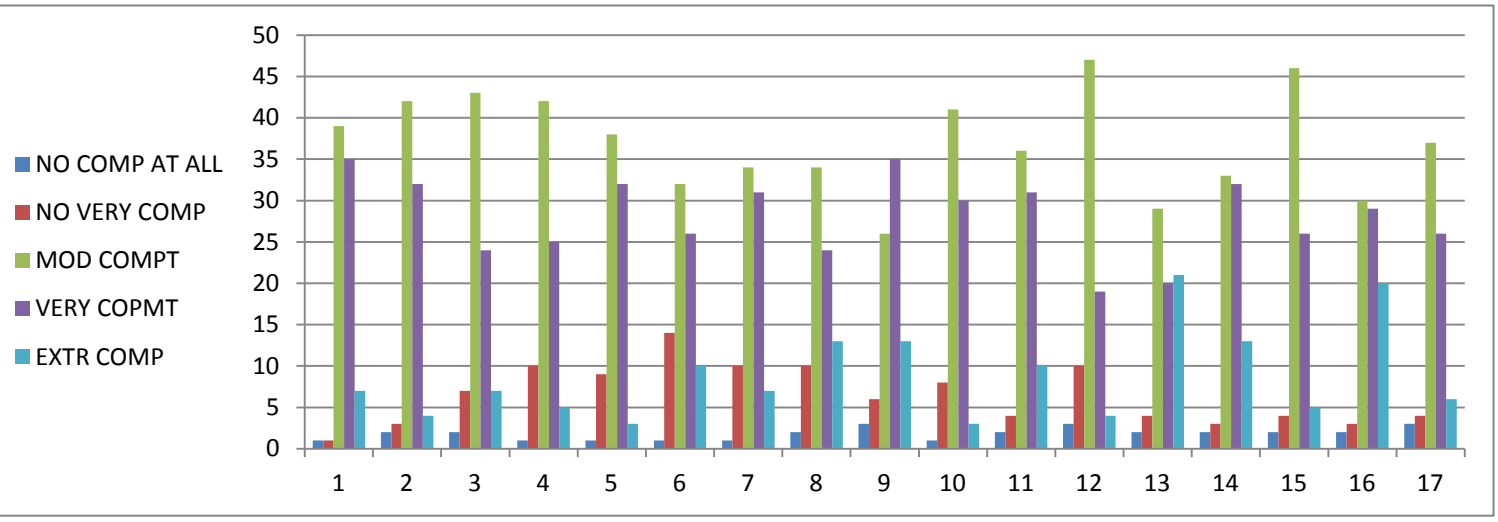


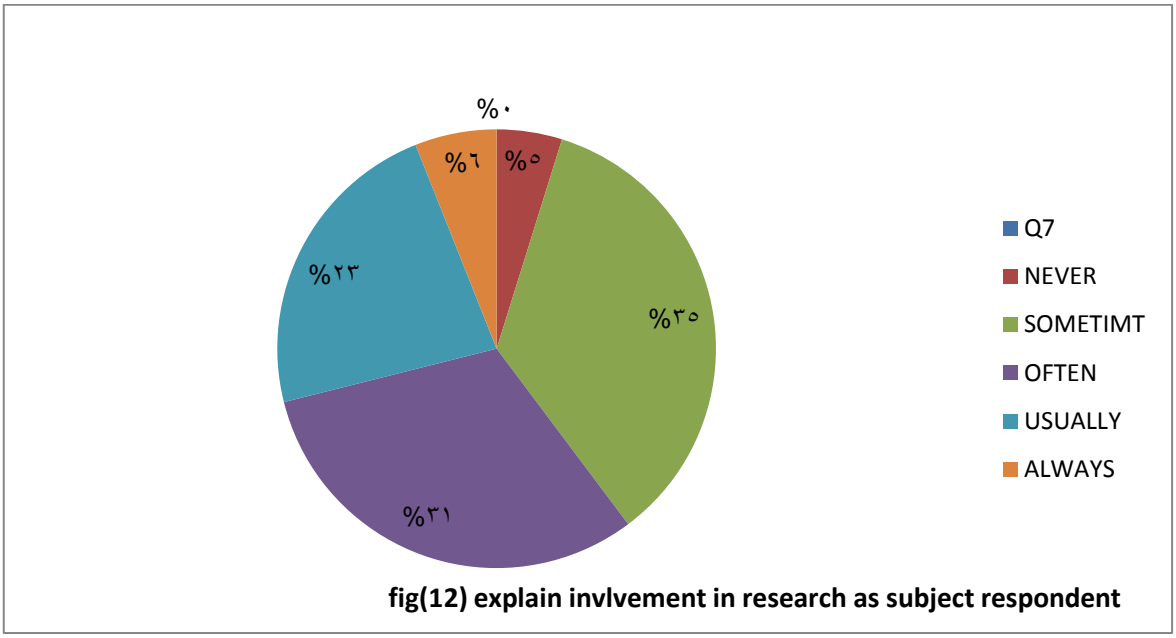
fig (10) expleain overall ability to design and conduct research

the result of according ability of pharmacists in planning and conducting research where conception of research idea where 7(9%),35(42%),39(47%),1(1%) and 1(1%) 0f extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively. the p value was 0.120,not significant the result of according searching the literature where 4(5%),32(38%),42(51%),3(4%)and 2(2%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively. the p value was 0.122,not significant the result of according in formulating research hypotheses and questions where 7(9%),24(29%),43(52%),7(9%) and 291%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively the p value was 0.094,not significant. the result of according Proposing appropriate study design or method 5(6%),25(30%),42(51%),10(12%) and 1(1%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively .the p value was 0.093,not significant the result of according writing research proposal where 3(4%),32(38%),38(46%),9(11%) and 1(1%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively the p value was 0.097,not significant. the result of according in define target population sample and eligibility criteria where 10(12%),26(31%),32(39%),14(17%) and 1(1%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively. the p value was 0.041 significant. the result of according determine appropriate sample and size 7(9%),31(39%),34(41%),10(12%) and 1(1%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively. the p value was 0.068,not significant choose the result of according sampling technique e.g. random where 13(16%),24(29%),34(41%),10(12%) and 2(2%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively p value was 0.041 significant. in ethical consideration where 13(16%),35(42%),26(31%),6(7%) and 3(4%) %) of extremely competent, very competent ,moderately competent, not very competent and not

competent at all respectively p value was 0.052 not significant. the result of according outlining detailed statistical plans to be used in data analysis 3(4%),30(36%),41(49%) 8(10%) and 1(1%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively p value was 0.106 not significant. the result of according design a data collection form where 10(12%),31(37%),36(43%),4(5%) and 2(3%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively value was 0.170 not significant . the result of according developing and validation a study instrument e.g. .questionnaire where 4(5%),19(23%),47(57%),10(12%) and 2(3%)%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively value was 0.110 not significant .in statistical analysis using software program e.g. SPSS where 21(28%),20(26%),29(38%),4(5%) and 2(3%) of extremely competent, very competent, moderately competent, not very competent and not competent at all respectively value was 0.044 significant. the result of according summarize data in table where 13(16%),32(38%),33(40%),3(4%) and 2(4%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively value was 0.070 not significant. the result of according interpretation of the finding and determine significance of obtained result where 5(6%),26(31%),46(56%),4(5%) and 2(2%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively value was 0.124 not significant. the result of according preparing a presentation (oral, poster) where 20(24%),29(34%),30(36%),3(4%) and 2(2%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively value was 0.051 not significant. the result of according writing manuscript for publication in scientific journal where 6(8%),26(34%),37(49%),4(5%) and 3(4%) of extremely competent, very competent ,moderately competent, not very competent and not competent at all respectively p value was 0.092 not significant. see fig (11)



the result of according involvement in research as a subject respondent where (6%),19(23%),26(31%),29(35%) and 44(5%) of always ,usually ,often ,sometime and never espectively. p value was 0.030 significant see fig(12)



fig(12) explain invlvement in research as subject respondent

the result of according involvement in research as principal investigator where 3(3%),13(16%),28(34%),31(37%) and 8(10%) of always ,usually ,often ,sometime and never respectively p value was 0.040 significant see the fig(13)

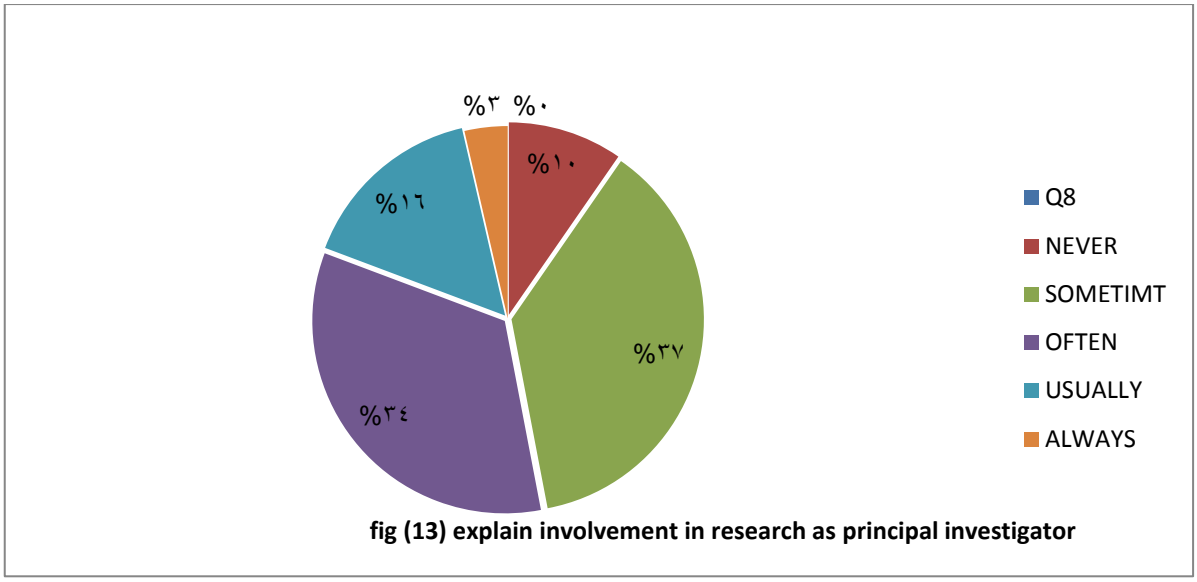
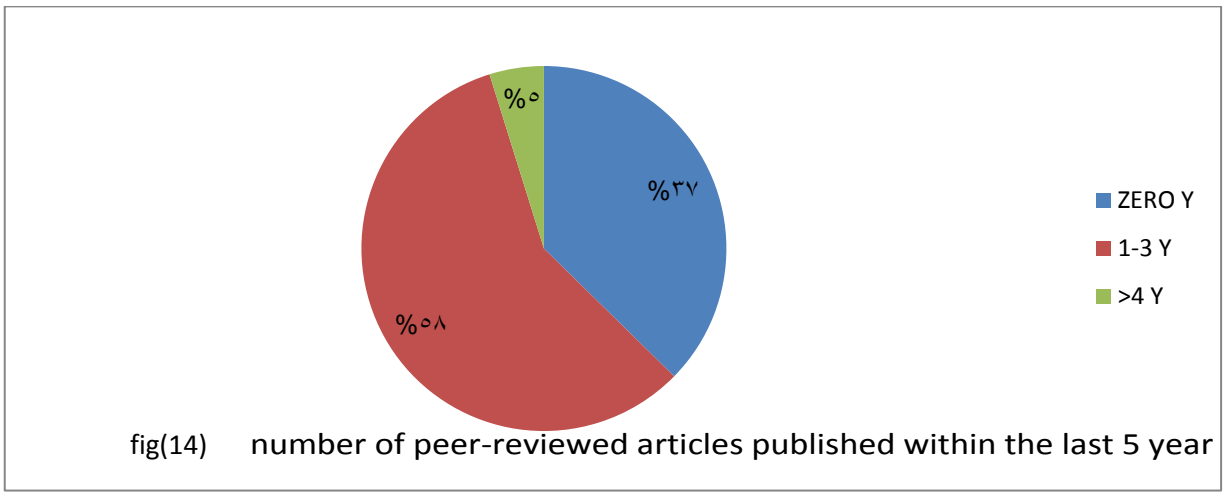


fig (13) explain involvement in research as principal investigator

the result of according number of peer-reviewed articles published within the last 5 year where 4(5%),48(58%) and 31(37%) of zero,1-3y,and ≥4 respectively, value was 0.163 not significant see the fig (14)



fig(14) number of peer-reviewed articles published within the last 5 year

the result of according number of peer-reviewed posters and/or abstracts in local regional conference since last 5 year. where 32(37%),43(58%) and 5(5%) of zero,1-3y,and ≥4 respectively. p value was 0.116 not significant see fig (15)

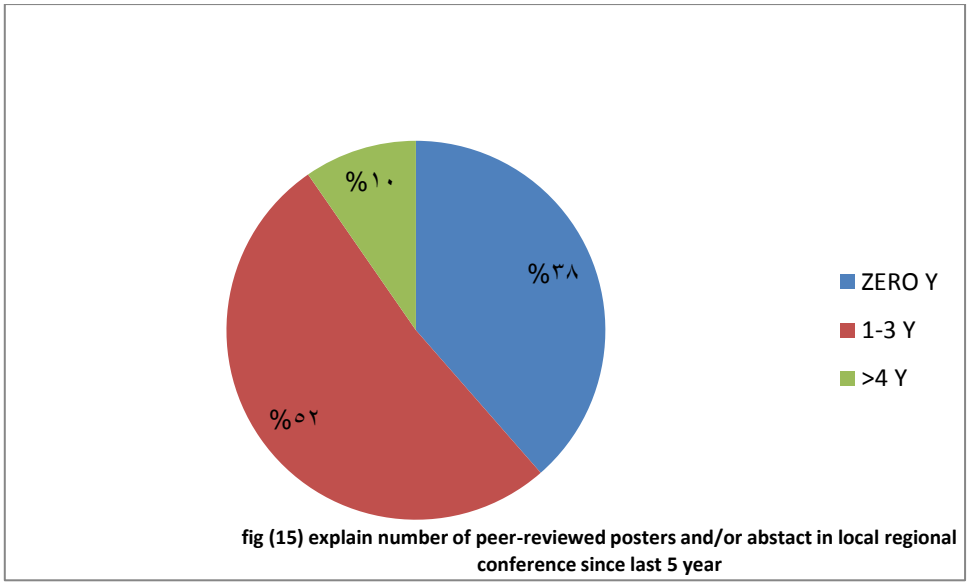
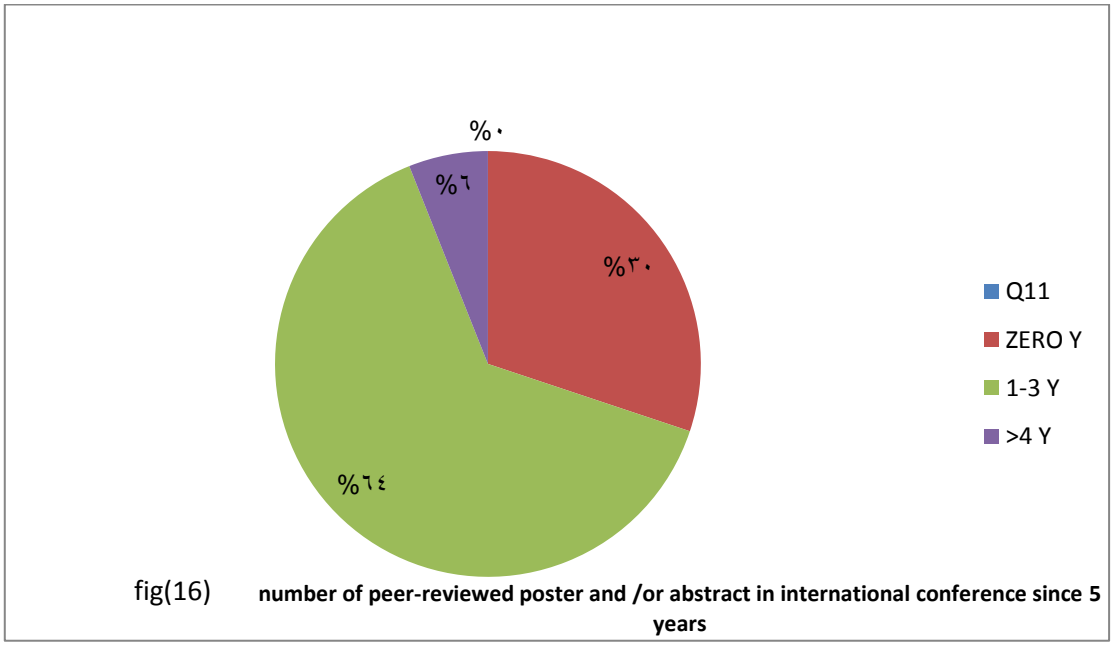


fig (15) explain number of peer-reviewed posters and/or abstact in local regional conference since last 5 year

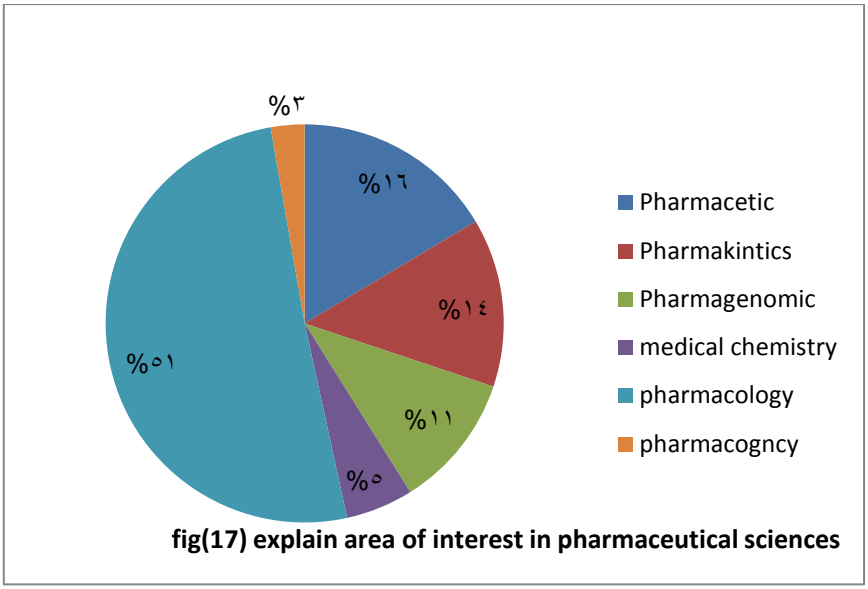
the result of according number of peer-reviewed poster and /or abstract in international conference since 5 years where 25(30%),53(64%) and 5(6%) of zero,1-3y,and ≥4 respectively p value was 0.185 not significant see fig below



fig(16) number of peer-reviewed poster and /or abstract in international conference since 5 years

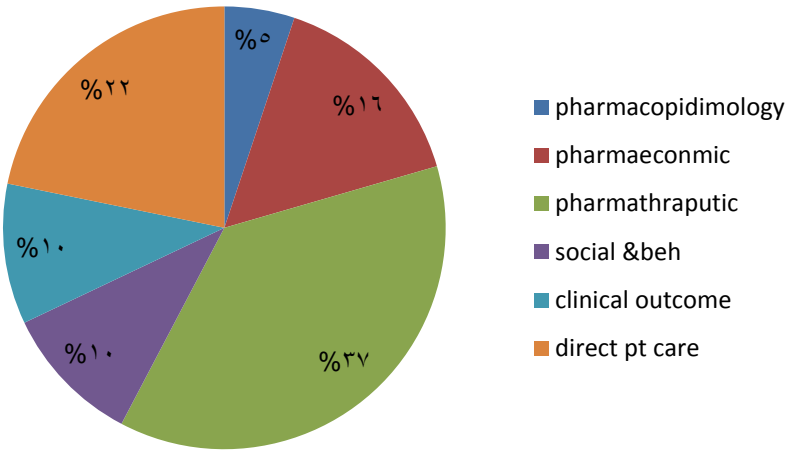
in the result of according terest in postgraduate studies where13(16%),15(18%),5(6%),38(46%) and 12(14%) 0f PhD,Master,residency and fellowship,pharmaD ,and not interested respectively .p value was 0.042 significant

In pharmacognocy respectively. area of interest in pharmaceutical sconces where 12(16%),10(14%) ,8(11%),4(5%),37(51%) and2(3%) 0f pharmaceutics pharmaceutics ,pharmagenomics,medical chemistry,pharmacology and pharmacognocy respectively p value was 0.07 not significant see fig (17)



fig(17) explain area of interest in pharmaceutical sciences

In area of interest in clinical pharmacy practice where 4(5%),12(16%),29(37%),8(10%),8(10%) and 17(22%) and zero of pharmacoepidemiology and drug safety,pharmaeconomics, pharmacotherapeutics research ,social and behavioral aspects of life, clinical outcome research ,direct patient care and other respectively p value was 0.50 significant see fig (18)



fig(18) explain area 0f interest in clinical pharmacy

Discussion

Although a large proportion (greater than three-quarters) of the practicing pharmacists in Iraq have expressed interest in conducting and learning about conducting health related research, they admitted to lacking previous experience in planning and conducting research. The majority of the pharmacists surveyed also reported no evidence of recent involvement in research activities. Research is needed in order to advance education, practice and decision-making. Often what is needed is local evidence that illustrates the need for a new service or different method of service delivery (Bond, 2006; Peterson et al., 2009). In general, several studies from around the globe have demonstrated reluctance among pharmacists for participating in practice and health-related research activities (Ellerby et al., 1993; Liddell, 1996; Rosenbloom et al., 2000; Bond, 2006; Saini et al., 2006; Armour et al., 2007;Peterson et al., 2009). This could partly be explained by the fact that research is not a mandate for pharmacists or a requirement for preregistration training in Iraq and many countries globally. Furthermore, informal postgraduate training programs such as pharmacy residency and fellowship programs are

currently not available in Iraq and other Middle Eastern countries. This raises questions about whether the current pharmacy curricula in the countries where the pharmacists graduated adequately prepare graduates to be competent in research and scholarly activities. We were unable to determine the extent of research training in the pharmacy curricula of the Middle East region from a study that extensively reported about pharmacy education and practice in 13 Middle Eastern countries (Kheir et al., 2009). The American College of Clinical Pharmacy and other scholars have highlighted the need for the involvement of pharmacists in clinical and practice-related research and have proposed core competencies and training requirements for pharmacist–researchers (Bond, 2006; Blouin et al., 2007; Smith et al., 2009; Poloyac et al., 201A recent study aimed at describing the views and attitudes of pharmacists towards pharmacy practice research in Middle East revealed that the pharmacists had positive attitudes towards research, they generally agreed that it was a professional responsibility to be involved in research and that it is important to establish an evidence-base to support practice (Elkassem et al., 2013). In recent years, the professional scope of pharmacy practice has undergone a major transformation globally and research plays an important role in underpinning evidence-based practice. Among other things, the mission of

pharmacy degree programs is to prepare graduates to provide optimal pharmaceutical care, advance health care outcomes, and promote research and scholarly activities (Knapp et al., 2011). Therefore, pharmacists in hospitals and other settings should strive to improve the quality of existing cognitive services and to develop new ones through research evidence (Davies et al., 1993; Bond, 2006; Armour et al., 2007; Blouin et al., 2007; Peterson et al., 2009; Smith et al., 2009; Knapp et al., 2011; Poloyac et al., 2011). They should also contribute to other health services research in collaboration with other health care professionals. In some parts of the world, hospital pharmacists, especially those with clinical training and affiliations, are increasingly becoming

more involved in collaborative research as part of their career development (Fagan et al., 2006; Smith et al., 2009; Knapp et al., 2011). This facilitates keeping up to date with, and contributing to, research and developments within theprofession. Despite the fact that the surveyed hospital pharmacists have reported possession of previous research-related training in the form of seminars or workshops, many of them have reported that they have inadequate (fair to poor) abilities in designing and conducting practice-related research. While the current study was unable to determine the content and depth of the training courses undertaken by the pharmacists, the content and intensive nature of such training programs would determine if the pharmacists have gained sufficient exposure to the core competencies required to be successful in research. The methods to train individuals for skills to conduct pharmacy practice as well as clinical and translational research have been extensively discussed in the literature (Blouin et al., 2007; Dowling et al., 2009; Smith et al., 2009; Knapp et al., 2011; Poloyac et al., 2011). Therefore, this delineates the needs for informal in-service training programs to strengthen research competencies and capacities of hospital-bound pharmacists. Furthermore, the curricula of undergraduate pharmacy schools have an important influence on pharmacists' capabilities and attitudes towards practice research. Such curricula should provide opportunities for stimulating research interests and cultivating positive attitudes towards research through comprehensive research training modules and the completion of pharmacy practice-based research projects (Kritikos et al., 2013). In general, the pharmacists admitted to lacking competence and confidence in several aspects of research including developing research protocols, critically appraising literature, undertaking and applying appropriate statistical techniques, and interpreting research findings. Consistent with the current findings, a previous study among pharmacists has documented a lack of confidence in their abilities to conduct research in general and an underestimation of what their profession iscapable of achieving (Armour et al.,

2007). This calls for short and long-term interventions targeted at practicing pharmacists and pharmacy students to change their mind-set and advocate for the importance of evidence-based practice and the role played by research in achieving this (Armour et al., 2007). There is a clear need for concerted efforts to educate hospital pharmacists and pharmacy students that existing hospital servicesare products of research and if new services are to be developed, then more research involvement is needed. It is imperative to establish pharmacy practice research networks between academia and other pharmacy practice settings. This would promote research culture and facilitate mentoring, which are essential elements in the training and development of novice researchers (Peterson et al., 2009).As a reflection of low research and scholarly productivity, the vast majority of the respondents did not publish any peer-reviewed journal articles or present research findings in local or international meetings within the last 5 years. In general, there is very little published data regarding the scientific publishing productivity of pharmacists (Lelie`vre et al., 2011). However, our findings are similar to what have been reported by other studies (Schwartz, 1986; Davies et al., 1993; Lelie`vre et al., 2011). A study investigating the predictors of publication productivity among hospital pharmacists in Canada and France reported that gender, having academic duties or a Ph.D. degree, having participated in a clinical trial, having secured research funding, and allocating protected time for research were significant predictive factors of the number of publications written by the pharmacists (Lelie`vre et al., 2011).The current findings are consistent with previous studies that have documented a lack of skills and knowledge, financial support or funding, and dedicated time to conduct research as significant potential barriers to participation in research (Davies et al., 1993; Ellerby et al., 1993; Liddell, 1996; Armour et al., 2007; Peterson et al., 2009; Elkassem et al.,2013). Research should be viewed as a mandate for pharmacypractitioners because it is a means of documenting and sharing evidence in the interest of improved healthcare outcomes and the

evolving roles of pharmacists (Bond, 2006; Peterson et al., 2009; Elkassem et al., 2013). Pharmacy leaders should strive to support other pharmacists in overcoming these barriers and pharmacists in all care settings should actively engage in research to improve patient outcomes and further develop the profession. Although this study is among the few that extensively report an inventory of hospital pharmacists' research activities in the Middle East, the findings are subject to some important limitations. The major limitation is that the assessment of research competence and confidence is highly prone to selfreport bias; the pharmacists subjectively self-assessed themselves in terms of research capabilities. Therefore, the findings might be overestimated as a result of potential social desirability bias. Furthermore, there were items that required the pharmacists to recall some historical data, thereby predisposing the findings to recall bias. The sample size was lower than estimated, which has an implication on the external validity of the findings. Therefore, one has to be cautious in generalizing the findings of the current study to all pharmacists

Conclusion:

A large proportion of pharmacists in Iraq self-assessed themselves as having deficiencies in several areas of research competencies, particularly in developing research protocols, critically appraising the literature, and applying theappropriate statistical techniques. The findings have important implications for developing informal research training and strong academic mentorship programs to bridge the gaps found among hospital-practicing pharmacists in Iraq. The results suggest that pharmacy educators and curriculum planners should include more extensive course content and experience related to pharmacy practice research in undergraduate curricula. This will increase exposure to research and a research career.

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Appendix1

1

Q2 & Q3	0.344	NOT SIG
Q2 & Q4	0.299	NOT SIG
Q2 & Q5	0.243	NOT SIG
Q2 & Q6	0.272	NOT SIG
Q2 & Q7	0.155	NOT SIG
Q2 & Q8	0.290	NOT SIG
Q2 & Q9	0.831	NOT SIG
Q2 & Q10	0.780	NOT SIG
Q2 & Q11	0.975	NOT SIG
Q2 & Q12	0.806	NOT SIG
Q2 & Q13	0.984	NOT SIG
Q2 & Q14	0.183	NOT SIG
Q3 & Q4	0.003	SIG
Q3 & Q5	0.020	SIG
Q3 & Q6	0.390	NOT SIG
Q3 & Q7	0.362	NOT SIG
Q3 & Q8	0.416	NOT SIG
Q3 & Q9	0.263	NOT SIG
Q3 & Q10	0.212	NOT SIG
Q3 & Q11	0.407	NOT SIG
Q3 & Q12	0.349	NOT SIG
Q3 & Q13	0.436	NOT SIG
Q3 & Q14	0.047	SIG
Q4 & Q5	0.011	SIG
Q4 & Q6	0.377	NOT SIG
Q4 & Q7	0.243	NOT SIG
Q4 & Q8	0.329	NOT SIG
Q4 & Q9	0.347	NOT SIG
Q4 & Q10	0.295	NOT SIG
Q4 & Q11	0.491	NOT SIG
Q4 & Q12	0.497	NOT SIG
Q4 & Q13	0.306	NOT SIG
Q4 & Q14	0.073	NOT SIG
Q5 & Q6	0.154	NOT SIG

Q5 & Q7	0.119	NOT SIG
Q5 & Q8	0.138	NOT SIG
Q5 & Q9	0.469	NOT SIG
Q5 & Q10	0.417	NOT SIG
Q5 & Q11	0.613	NOT SIG
Q5 & Q12	0.727	NOT SIG
Q5 & Q13	0.282	NOT SIG
Q5 & Q14	0.027	SIG
Q6 & Q7	0.102	NOT SIG
Q6 & Q8	0.019	SIG
Q6 & Q9	0.844	NOT SIG
Q6 & Q10	0.792	NOT SIG
Q6 & Q11	0.988	NOT SIG
Q6 & Q12	0.655	NOT SIG
Q6 & Q13	0.508	NOT SIG
Q6 & Q14	0.113	NOT SIG
Q7 & Q8	0.015	SIG
Q7 & Q9	0.987	NOT SIG
Q7 & Q10	0.936	NOT SIG
Q7 & Q11	0.869	NOT SIG
Q7 & Q12	0.467	NOT SIG
Q7 & Q13	0.274	NOT SIG
Q7 & Q14	0.233	NOT SIG
Q8 & Q9	0.993	NOT SIG
Q8 & Q10	0.942	NOT SIG
Q8 & Q11	0.862	NOT SIG
Q8 & Q12	0.463	NOT SIG
Q8 & Q13	0.288	NOT SIG
Q8 & Q14	0.202	NOT SIG
Q9 & Q10	0.051	NOT SIG
Q9 & Q11	0.144	NOT SIG
Q9 & Q12	0.287	NOT SIG
Q9 & Q13	0.584	NOT SIG
Q9 & Q14	0.453	NOT SIG
Q10 & Q11	0.196	NOT SIG
Q10 & Q12	0.339	NOT SIG
Q10 & Q13	0.532	NOT SIG
Q10 & Q14	0.402	NOT SIG
Q11 & Q12	0.143	NOT SIG
Q11 & Q13	0.728	NOT SIG
Q11 & Q14	0.597	NOT SIG
Q12 & Q13	0.858	NOT SIG
Q12 & Q14	0.644	NOT SIG
Q13 & Q14	0.661	NOT SIG