Research Article

Nurse Practitioners' Perception on Research Utilization and Possible Barriers; A Saudi Arabian Experiential Perspective during Covid-19 Pandemic

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Abstract

Background: Research utilization in any professional practice, just like in the nursing profession, is an important component needed by practitioners to be able to incorporate into practice current innovations and best practices as such provided by Evidence-Based Practice (EBP). Most especially so during the current predicament when the world is plunged into a pandemic situation. **Aim:** The goal of this research endeavor is to know nurse practitioners' perception in the utilization of research in individual practice and possible barriers that prevent its application in a Saudi Arabia context during the Covid-19 Pandemic period. **Method:** Through a survey research design done on-line, about 303 nurses from different departments participated who were all working currently in one of largest government Medical Cities in Riyadh. Descriptive statistics were used including tests of association and significant differences. **Results:** Results showed the following basic demographic features: female-dominated aged 31-40 years old, mostly married and non-Saudi. Respondents extended the same level of moderate research utilization, and acknowledging barriers in the same. Additionally, there seemed to have statistical associations found between research barriers concept and in the following demographic characteristics: sex (p=.001), nationality (p=.001), education (p=.05), and years of experience (p=.05). Statistically significant differences in responses were found in the following when computed bivariate on research utilization: nationality (.05), and area of assignment (.05). While there were also more significant differences in responses found on research barriers; sex (p=.001), nationality (p=.001), education (p=.05), and professional role (p=.05). **Conclusion:** The experience of research utilization found in this Saudi Arabia medical institution was characterized by moderate level utilization with same level of recognized research barriers even during this current pandemic situation. This can imply an acceptable level of research utilization among nurse practitioners with existing comparable barriers that could become for them areas of possible improvement and a venue to improvement on especially during Pandemic situation where innovations happen and much needed in the practice.

Keywords: Nursing Research; Research Utilization; Research Barriers; Saudi Arabia

Introduction

Current trends of nursing practice require higher level of expression that it became a necessity to not just practice but to practice with the "*evidentiary*" basis, hence, the application of EBP or Evidence-based Practice in the nursing profession. Experts defined EBP as the "*synthesis and application of scientific information derived from systematic research findings such as clinical trials and patient preferences for patient care*" [1,2]. One of the subsets of EBP was research utilization which is defined as an application process of evidenced-based knowledge into everyday practice [3], and the need for research as source of current best practices and other innovations [4]. Other scholars defined research utilization as "*thorough use of theory-derived, research-based information in making clinical decisions about healthcare delivery to patients needs and preferences*" [5] which comes more relevant if not of utmost importance in the present world predicament as the Covid-19 virus has affected more than the majority of countries and territories regardless of military or economic might. Research utilization has been recognized by the healthcare community and governing authorities as a critical step in providing quality and safe nursing practice [3]. The advantages of applying evidence-research into everyday practice elevates quality of care and professional growth of nurses [5,6]. The growing body of nursing research refines and increase the current knowledge and has the potential to contribute in the improvement of nursing practice more importantly during the most critical part of humanity's history expecting every profession (just like nursing) to contribute and make a difference not now but in the most immediate time possible.

In Saudi Arabia, the volume of research is increasing in the medical and nursing fields. It has been reported evidenced-based research and research utilization for dental and medical context. Similarly with other countries, nurses in Saudi Arabia needed to utilize research findings in practice to achieve optimum levels of EBP; and the quality of healthcare Nursing research has advanced significantly throughout recent years expecting the use of research findings to promote and improve healthcare quality [7,8]. Participation in any research activities could lead to a better condition of health care through the utilization of finding focused on innovative care approaches. It was such a long time ago that a pandemic condition affected humanity and the world, and when it did in the many past decades ago the conditions were different in terms of technology and scientific advancement. It led to deaths of monumental counts and it should not happen now as advantages are at hand having technological and scientific advancement showed more than many ways of improved health care practices

through relevant researches and activities. And still according to current updates, World Health Organization (WHO) showed the total confirmed cases at more than 298 million, and death toll at 5.4 million despite a 9.1 billion doses of vaccine administered already.

Studies conducted in other countries concluded that positive attitudes, availability, and support for research utilization can contribute to greater use of research in nursing practice, and above half (50%) of the nurses considered they had access to research findings at work but the percentage of time to read about research on duty was lower (Moe & Enmarker, 2020). Consistent favorable consideration of research utilization attitude can lead to appreciable changes in practice though results tended to just show half of practitioners, there can be room for improvement and still must require a necessity to find out what seemed to be reasons to the contrary by the other half of the practitioners. Additionally, Kyalo Mutisya et al. found out in their own research findings that half of the studies conducted were implementing research findings to practice [9].

Barriers to research utilization have been reported and analyzed by qualitative and quantitative methods in several countries. In Saudi Arabia, the most perceived barriers to research utilization among nurses were organizational factors considering support from managers [10,11] including "*…lack of financial support from the institution, shortage of manpower or personnel not having enough time, unable to understand research reports, lack of validity and reliability, and lack of knowledge and dependence of nurses among physicians and managers…*" [12, 5]. How to further improve research utilization eventually improving general healthcare delivery and management can also mean focusing on hindrances and difficulties faced by practitioners themselves. On the actual practice scenario, these difficulties may easily be brushed off totally disregarding each and every concern as experienced while delivering the necessary care needed to improve patient conditions. It might not just entirely be the practitioners themselves who had faced these barriers but others (e.g., managers and administrators) might have contributed or facilitated unknowingly. A major challenge is to gain better understanding of factors that facilitate or serve as a barrier in the implementation and utilization research including individual and organizational factors. Although, the trend of nursing research in Saudi Arabia is increasing, for our present study we faced a little information or obsolete research about nurses utilizing research results in the kingdom.

Thus, this study aims to identify research utilization among nurse practitioners and possibly find barriers to research utilization during practice in a government medical city in Saudi Arabia so especially that experience was focused during the Covid-19 Pandemic era.

Methods

The questionnaire-based study used a cross-sectional quantitative design as it included participants from different segments of a chosen large group of respondents pre-determined by design.

Participants and Procedures: The study participants were recruited from one of the largest government medical cities in the City of Riyadh during the height of Covid-19 Pandemic of 2020. Having gained the approval and support of the health institution's managers and administrators agreeing with the physical limitations found in the IRB approved document (King Saud University – IRB Approval No. E-20-4653), data gathering was done through online using the google form to seek everyone's participation. From about 1700 nurses in the hospital, there were 303 nurses who participated in the online data gathering understanding the schedule and physical load they were having during the middle of 2020. Data gathering went through several follow ups spanning 4-6 months just to be able to finally decide and accommodate the 303 complete responses. As hoped, the consideration of acceptable was based on the minimal representation from the different hospital wards in the said university medical city.

Research Instrument: The study designed a data gathering instrument with three parts which are as follows:

(1) Demographic features grouped into two (personal variables and professional variables),

(2) Research Utilization Questionnaire with 29 items to be rated using 4-point Likert scale (1-strongly disagree, 2-disagree, 3-agree, and 4-strongly agree)

(3) Barriers to Research Utilization Questionnaire with 30 items to be rated with 4-point Likert scale (1-strongly disagree, 2-disagree, 3-agree, and 4-strongly agree).

Research Utilization Questionnaire. Barriers to Research Utilization Scale was developed in the year 1987 [13,14] used by hundreds of researchers translated into different major languages in different many research activities. Permission to use was declared for public and academic use through an expressed letter of request which was complied with. The general internal consistency Cronbach α coefficient of the scale was 0.87 and the scale was accepted as reliable [15].

Data Analysis: The data used in this study were analyzed using IBM SPSS Version 23. Descriptive statistics was utilized to characterize all participating nurse practitioners presented through frequency, percentages and crosstabulation as data were categorical in nature including mean and standard deviation measures. The same were used in the analyses of rated research utilization and possible barriers where a 4-point Likert scale were assigned as follows: research utilization statements used 1-strongly disagree, 2-disagree, 3-agree, and 4-strongly agree; while possible research

barriers statements used 1-no extent, 2-little extent, 3-moderate extent, and 4- great extent. Chi-square test of association was utilized to examine significant relationships between identified personal and professional variables against research utilization and possible barriers mean ratings. Also, non-parametric Mann-Whitney U test was used to evaluate significant difference in the ratings when the original demographic features were transformed into its bivariate form. All levels of significance were set at p ≤ .05 in this study as while p ≤. 01 was considered even better in some results.

Ethical consideration: As the data gathering was done online, informed consent was obtained from the professional participants and that their actual participation showed proof of their consent to participate as it is voluntary. There was also an IRB (Institutional Review Board) that reviewed the proposal and eventually provided an approval strictly emphasizing the indirect and impersonal approach of data gathering procedure. Participants were accorded the right to refuse or to withdraw from the study in any time they want reassuring them all that data collected will be held in utmost confidentiality. Data shall be kept by the primary and corresponding author at his present institutional affiliation and availability is may be accorded to external parties upon written request to the same. Conveniently, datasets used and/or analyzed during the current study are available in the Synapse Repository with Synapse ID: syn24606750 and DOI: 10.7303/syn24606750.

Results

The results of this study are presented as follow: characteristics of the participants obtained in clustered variables like (1) personal variables which included age, sex, civil status and nationality, and (2) professional variables which included educational background, work tenure or service in years, professional role, and area of assignment. Followed by the respondents' perception on research utilization and barriers with equivalent ratings. Another major result are the possible relationships existing between demography and research utilization or the barriers. Lastly, the possible differences in the ratings given on the identified dependent variables considering bivariate demographic features.

Demography: Table 1 shows the basic characteristics of the participants grouped into personal and professional variables. Considering the highest frequencies, the pool of participants was mostly aged between 31-40 years old (*n* = 171; 56.4%) with the youngest participant as 21 years old and the oldest as more than 60 years old, female dominated (*n* = 232; 76.6%), married (*n* = 204; 67.3%), and mostly non-Saudis (*n* = 208; 68.6%). Professional features included a majority respondents being bachelor level graduates (*n* = 167; 55.1%), with more than 6 years of professional experience (*n* = 225; 74.3%) in a staff level position (*n* = 241; 79.5%). Highest participated came from those who were assigned in non-critical area like the Psychiatric Department (*n* = 86; 28.4%).

Criteria	f	%
Personal Variables:		
Age (31-40 years old)	171	56.4
Sex (Female)	232	76.6
Civil Status (Married)	204	67.3
Nationality (Non-Saudi)	208	68.6
Professional Variables:		
Education (Bachelor)	167	55.1
Service/Tenure (More than 6 years)	225	74.3
Professional Role (Staff Nurse)	241	79.5
Area Assignment (Psyche Department)	86	28.4

Table 1: Demographic Data.

Research Utilization: Participants were asked about research utilization which had the following results: Dimension 1 on "attitude index" showed a mean rating of 2.55 (SD = 0.521) which corresponded to "moderate extent", Dimension 2 on "availability and support index" showed a mean rating of 2.58 (SD = 0.521) which corresponded to "moderate extent", Dimension 3 on "research use index" showed a mean rating of 2.48 (SD = 0.602) which corresponded to "a little extent", and the over-all research utilization average rating of 2.71 (SD = 0.638) which corresponded to "moderate extent". Additionally, Dimension 1 majority items (7 of 13 items) were found at moderate extent like their belief that research may be put to practice, that research is understandable, and their clinical team supported research utilization. Three (3) items were rated at great extent believing that research is stimulating and interesting, and professionally advantageous. In Dimension 2, more than half (4 of 7 items) had that moderate extent of perception specifically on their unit manager's support, use of research in the work place and community, and that there is research education right at the workplace. On the actual research use index under Dimension 3, a great majority (7 of 9 items) were found at a moderate extent rating focused on practice based professional activities, research findings are applied in clinical practice, or an active participation to seek out related researches to clinical practice.

Item #		Mean	SD	Remarks
	Dimension 1: Attitude Index			
1	I wish to change my practice to make it based on research	2.88	0.892	To a moderate extent
2	I want to base my practice on research	3.07	0.799	To a moderate extent
3	Clinical practice should be based on practice	3.24	0.752	To a moderate extent
4	Participating in research is a waste of time	1.74	0.888	To no extent
5	Understanding research helps me professionally	3.50	1.830	To a great extent
6	I think research is interesting	3.30	0.695	To a great extent
7	Research is stimulating	3.27	0.695	To a great extent
8	Research is understandable	3.08	0.730	To a moderate extent
9	Research is dull boring project	2.04	0.862	To a little extent
10	It is not relevant to use research in my day-to-day practice	2.11	0.879	To a little extent
11	Basing clinical practice on research is time saving	3.07	0.762	To a moderate extent
12	Research findings are too complex to use in practice	2.51	0.813	To a moderate extent
13	The clinical team I work supports research utilization	2.82	0.870	To a moderate extent
	Dimension Average Rating	**2.55**	**0.521**	**To a moderate extent**
	Dimension 2: Availability and Support Index			
14	My unit manager supports research utilization	2.82	0.859	To a moderate extent
15	The quality of research is not so good that it can't be used in practice	2.19	0.870	To a little extent
16	I have access to research findings where I work	2.46	0.919	To a little extent
17	I have time to read about research while I am on duty/work	2.15	0.966	To a little extent
18	Research is performed in my work place	2.55	0.893	To a moderate extent
19	Research is performed in my community	2.69	0.852	To a moderate extent

20	Education in research is carried out in my work place	2.69	0.904	To a moderate extent
	Dimension Average Rating	**2.58**	**0.521**	**To a moderate extent**
	Dimension 3: Research Use Index			
21	I base my practice on research	2.74	0.765	To a moderate extent
22	My clinical practice is based on research	2.79	0.780	To a moderate extent
23	I do not use research in my day-to-day practice	2.31	0.881	To a little extent
24	I use research findings in my clinical practice	2.85	0.768	To a moderate extent
25	I apply research findings in my clinical practice	2.86	0.757	To a moderate extent
26	I help others to apply research in clinical practice	2.87	0.789	To a moderate extent
27	I use research to guide my clinical practice	2.88	0.777	To a moderate extent
28	I cannot apply research findings in my clinical practice	2.30	0.869	To a little extent
29	I seek out research related to my clinical practice	2.88	0.782	To a moderate extent
	Dimension Average Rating	**2.48**	**0.602**	**To a little extent**
	Over-all Research utilization Average Rating	**2.71**	**0.368**	**To a moderate extent**

Table 2: Dimensions of Research Utilization among the respondents; n=303; Ranges: 1.00 - 1.75 To no extent; 1.76 - 2.50 To a little extent; 2.51 - 3.25 To a moderate extent; 3.26 - 4.00 To a great extent.

Table 2 shows that the over-all research utilization rating is at a moderate extent putting a positive appreciation of research utilization in nursing practice among the participants' actual professional practice attitude wise, availability and support presence, and an actual research use in their daily clinical practice.

Research Utilization Barriers: On the research barriers variable, there were four (4) factors according to the instrument used. Factor 1 refers to barriers coming from the nurses' research values, skills and awareness with 6 of 8 items being rated at "little extent" and the other 2 at "moderate extent". It had a mean rating of 2.43 (SD = 0.585) equivalent to "little extent". Factor 2 refers to barriers from organizational settings, barriers and limitations with 7 of 8 items being rated at "moderate extent". It had a mean rating of 2.69 (SD = 0.577) equivalent to "moderate extent". Factor 3 refers to the barriers from innovations or qualities of research with 4 of 6 items being rated at "moderate extent". It had a mean rating of 2.56 (SD = 0.543) equivalent to "moderate rating". Factor 4 refers to the barriers from communication or presentation and accessibility of the research with half of the 6 items being rated at "moderate extent" while the other half at "little extent". It had a mean rating of 1.80 (SD = 0.428) equivalent to "little extent". Table 3 shows that the over-all research barrier mean rating is 2.54 (SD = 0.510) equivalent to a "moderate extent".

Item #		Mean	SD	Remarks
Factor 1:	*Barriers from Nurse's research values, skills and awareness*			
9	The nurse feels the benefits of changing practice will be minimal	2.68	0.797	To a moderate extent
16	The nurse sees little benefits for self	2.61	0.865	To a moderate extent
15	The nurse is isolated from knowledgeable colleagues with whom	2.49	0.876	To a little extent
28	The nurse does not feel capable of evaluating quality of research	2.47	0.875	To a little extent
21	There is no documented need to change practice	2.35	0.885	To a little extent
20	The nurse does not see the value of research for practice	2.28	0.890	To a little extent
26	The nurse is unwilling to change/try new ideas	2.28	0.912	To a little extent
5	The nurse is unaware of the research	2.25	0.911	To a little extent
	Factor 1 Research Barriers Average Rating	**2.43**	**0.585**	**To a little extent**

Item #				
Factor 2:	***Barriers from organizational settings, barriers and limitations***			
7	The nurse does not have time to read research	2.84	0.892	To a moderate extent
13	The nurse does not feel she/he has enough authority to change care	2.81	0.872	To a moderate extent
14	The nurse feels results are not generalizable to own setting	2.73	0.800	To a moderate extent
29	There is insufficient time on the job to implement new ideas	2.73	0.873	To a moderate extent
18	Physician will not cooperate with implementation	2.72	0.808	To a moderate extent
6	The facilities are inadequate for implementation	2.59	0.883	To a moderate extent
25	Other staff are not supportive of implementation	2.58	0.920	To a moderate extent
19	Administration will not allow implementation	2.48	0.845	To a moderate extent
	Factor 2 Research Barriers Average Rating	**2.69**	**0.577**	**To a moderate extent**
Item #				
Factor 3:	***Barriers from Innovations (Qualities of research)***			
17	Research report/articles are not published fast enough	2.77	0.783	To a moderate extent
10	The nurse is uncertain whether to believe the results of the research	2.61	0.742	To a moderate extent
8	The research has not been replicated	2.59	0.796	To a moderate extent
11	The research has methodological inadequacies	2.57	0.751	To a moderate extent
23	The literature reports have conflicting results	2.45	0.787	To a little extent
22	The conclusion drawn from the research are not justified	2.39	0.814	To a little extent
	Factor 3 Research Barriers Average Rating	**2.56**	**0.543**	**To a moderate extent**
Item #				
Factor 4:	***Barriers from Communication (Presentation and Accessibility of the research)***			
1	Research report/articles are not readily available	2.63	0.819	To a moderate extent
12	The relevant literature is not compiled in one place	2.60	0.738	To a moderate extent
2	Implications for practice are not made clear	2.53	0.775	To a moderate extent
24	The research is not reported clearly and readably	2.46	0.860	To a little extent
3	Statistical analyses are not understandable	2.43	0.831	To a little extent
4	The research is not relevant to nurse's practice	2.12	0.868	To a little extent
	Factor 4 Research Barriers Average Rating	**1.80**	**0.428**	**To a little extent**
Over-all Research Barrier Average Rating		**2.54**	**0.510**	**To a moderate extent**

Table 3: Dimensions of Research Barriers among the participants; n=303;Ranges:1.00 - 1.75 To no extent;1.76 - 2.50 To a little extent; 2.51 - 3.25 To a moderate extent;3.26 - 4.00 To a great extent.

Demography and Research Utilization/Barriers:

Test of Association: Demography of the respondents were classified under personal and professional variables each having their own specific features. All of these were tested for possible associational value with the chosen dependent variables, e.g., research utilization ratings, and research barriers ratings. Chi-square test of independence was performed to examine the relationship between research utilization rating averages (RURA) with the following personal variable like age, sex, civil status and nationality, it showed no significant associations (age and RURA: p =.059; sex and RURA: p =. 45; civil status and RURA: p =.702; nationality and RURA: p=.14). The same were the results when another Chi-square test of independence was performed to examine research utilization rating averages with the professional variables like education, experience, professional role, and area of assignment (education and RURA: p=.67; experience in years and RURA: p=.49; professional role and RURA: p=.57; area of assignment and RURA: p=.19) (See Table 4 for details). However, Table 5 showed four (4) demographic variables with outcomes directly and differently when tested against research barriers rating averages (RBRA). A chi-square test of independence was performance to examine the relationship between sex and RBRA. The relationship between these variables was significant, X^2 (3, n = 232) =18.330, p=.001 where women were more likely to identify research barriers than men. The same test was applied between nationality and RBRA, the relationship between the variables was significant also, X^2 (3, n = 208) =16.130, p=.001 where non-Saudi respondents were more likely to identify research barriers than Saudi respondents. Among the professional variables, there were also two that came with the same results. Using the same test between education and RBRA, the association was significant X^2 (9, n = 167) =20.480, p=.015. The same was done with experience in years and RBRA, the association was significant X^2 (6, n = 225) =14.452, p=.025. Bachelor level respondents were more able to identify research barriers in practice just like those with more than 6 years of service.

Demography	Research Utilization			Barriers		
	x^2	df	$p*$	x^2	df	$p*$
Personal Variables:						
Age (Years)	12.149	6	0.059	6.268	9	0.713
Sex	1.593	2	0.451	18.330	3	0.001*
Civil Status	3.816	6	0.702	5.118	9	0.824
Nationality	3.915	2	0.141	16.130	3	0.001*
Professional Variables:						
Education	4.059	6	0.669	20.480	9	0.015*
Experience (Years)	2.917	4	0.490	14.452	6	0.025*
Professional Role	0.555	2	0.572	15.835	9	0.070
Area of Assignment	20.640	16	0.193	19.806	24	0.708

Table 4: Association between Demographic Variables VS Research Utilization Ratings & Research Utilization Barriers.

Demography	Higher Category	Research Utilization				Research Utilization Barriers			
		n/Mn Rank	U	z	p	n/Mn Rank	U	z	p
Personal Variables:									
Age	30 years old and under	(69) 141.61	7356.0	-1.325	0.185	(69) 146.67	7705.5	-0.629	0.529
	Over 30 years old	(234) 155.06				(234) 153.57			
Sex	Male	(71) 143.89	7660.0	-1.054	0.292	(71) 181.27	6158.0	-3.522	0.001*
	Female	(232) 154.48				(232) 143.04			
Civil Status	Single/Never Married	(90) 145.32	8984.0	-1.019	0.308	(90) 147.98	9223.5	-0.568	0.570
	Not Single	(213) 154.82				(213) 153.70			

Nationality	Saudi	(95) 139.68	8710.0	-1.954	0.050*	(95) 178.71	7343.0	-3.926	0.001*
	Non-Saudi	(208) 157.63				(208) 139.80			
Professional Variables:									
Education	Bachelor level	(251) 153.79	6077.0	-0.923	0.356	(251) 147.53	5404.5	-2.136	0.033*
	Postgraduate level	(52) 143.37				(52) 173.57			
Experience (years)	6 years and below	(78) 146.73	8364.0	-0.729	0.466	(78) 146.10	8314.5	-0.756	0.449
	More than 6 years	(225) 153.83				(225) 154.05			
Professional Role	Staff position	(241) 150.39	7084.0	-0.743	0.457	(241) 147.47	6380.0	-1.942	0.050*
	Managerial/Admin position	(62) 158.24				(62) 169.60			
Area of Assignment	Critical area	(62) 169.15	6408.0	-2.042	0.041*	(62) 153.51	7377.5	-0.166	0.868
	Non-critical area	(241) 147.59				(241) 151.61			
n=303 α = .05									

Table 5: Significant Difference in the Research Utilization and Barriers Rating VS Dichotomized Demography; n=303; α = .05.

Demography and Research Utilization/Barriers:

Test of Significant Difference: To test possible differences in the rating averages made by the respondents both on research utilization and barriers, the demographic features were re-grouped into a bivariate situation from the original more than 2 categories as shown in Tables 4 and 5. A Mann-Whitney U test was performed in the different bivariate personal variables and only "nationality" came out to have significant difference in their research utilization rating averages (RURA). The result indicated that the difference was statistically significant, $U(N_{Saudi}=95, N_{Non-Saudi}=208) = 8710.0$, $z=-1.954$, $p<.050$. The same was the case in one of the professional variables which is area of assignment. The result indicated that the difference was statistically significant, $U(N_{Critical\ area}=62, N_{Non-critical\ area}=241) = 6408.0$, $z=-2.042$, $p<.0410$. As regards the research barrier rating averages (RBRA) and the bivariate demographic features, more interesting results came out. Among the personal variables in bivariate form, sex and nationality came out to have significant differences in their own respective subcategories. Considering the sex the result indicated that the difference was statistically significant, $U(N_{male}=71, N_{Female}=232) = 6158.0$, $z=-3.522$, $p<.001$ while nationality the difference was statistically significant at $U(N_{Saudi}=95, N_{Non-Saudi}=208) = 7343.0$, $z=-3.926$, $p<.001$. From among the professional variables, there showed significant results in education $U(N_{Bachelor\ level}=251, N_{Post\ graduate\ level}=52) = 5404.5$, $z=-2.136$, $p<.033$) and professional role $U(N_{Staff\ position}=241, N_{Managerial/Admin\ position}=62) = 6380.0$, $z=-1.942$, $p<.050$).

Discussion

In general, the need for research in practice had been a topic near to the heart of clinical nurse educators and practitioners alike as it was found to have relevance in improved health care delivery and even in practical clinical applications from all clinicians like nurses [16]. This study aimed to identify the perception on research utilization and possible barriers of its usage in practice among nurses in Saudi Arabia and whose opportunity came during the current pandemic situation affecting the world. There may be value in the discovery of research utilization separate from the more popular research studies on research utilization barriers and both entirely supported by prevailing known reference literature though evidence-based practice came as infrequently, superficially, or even misused [17]. Present study results obtained during the pandemic months will be discussed side-by-side citing sources conferring and/or contradict pre-pandemic similar studies both local and international. In Saudi Arabia, the volume of research is increasing in the medical and nursing fields relevant to reported evidenced-based research and research utilization for dental and medical context [7]. Similarly with other countries, nurses in Saudi Arabia needed to utilize research findings in practice to achieve optimum levels of evidence-based practice (EBP); and the quality of healthcare Nursing research has advanced significantly throughout recent years expecting the use of research findings to promote and improve healthcare quality [8] in general whether there are existing health emergencies but more so believed during such situations.

Note that cited studies in the foregoing discussions utilized published articles during the pandemic period (2019-present) but still were utilized during the "pre-pandemic discussions" because their actual data gathering were all checked to have happened during pre-pandemic months.

Research Utilization: In this study, there was a general moderate extent of research utilization among the respondents as showed in the average rating given. Attitude-wise, nurse practitioners that participated had that highest belief research is "*stimulating, and interesting, and that it helped them professionally*" to quote that very words used in the data gathering tool. It surely was a positive appreciation and research utilization attitude by the respondents as can be observed even during the very upsurge of Covid-19 Pandemic where there was as well an upsurge of publication and research studies [18]. It was even emphasized that research utilization during the pandemic period was significantly influenced by the nurses' competency and beliefs or as positive attitude [19]. Studies conducted in other countries concluded that positive attitudes, availability, and support for research utilization can contribute to greater use of research in nursing practice, and about half (50%) of the nurses considered they had access to research findings at work but the percentage of time to read about research on duty was lower [20]. Consistent favorable consideration of research utilization attitude can lead to appreciable changes in practice though results tended to just show half of the same practitioners in that same study did show negative appreciation. Alternative perspective to negative attitude was the low appreciation or even the lack of evidence-based practice utilization [20]. These can be room for improvement and still must require that necessity to find out what seemed to be the reasons for such adverse behavior towards research and its utilization. The professional development or continuing education of nurses through research utilization has an inherent power to increase quality of healthcare [21]. In the United States, research utilization was included in job description and nurses who utilized research to solve clinical problem were recognized and rewarded [22]. This could be the pandemic situation considering the perception of respondents about research utilization.

Prior to Covid-19 Pandemic considering different publications with that much related topic on research utilization in their practice, the foregoing shall constitute enough consideration to show status and comparison from the previously mentioned discussion. To start, studies showed a resounding appreciation of research [23] in their practice highlighted by more than majority practicing evidence-based nursing along with some 20% participation in research work while more than half have utilized research findings in their daily work [9]. Though fraught with different barriers, another study suggested a general "positive attitude" towards research utilization in practice but mostly by the more senior nurse practitioners like nurse educators and clinical nurse specialist [24]. In an international conference presentation by Abujaber and Nashwan,[25] though there is appreciation and participation among nurses in general, there was this existing "*time lag between generation of evidence and putting it into clinical practice*" which could take about 15-20 years as concurred by Melnyk [26] and Pitsillidou et al. [27] studies that specified the 15 instead of 17 years of evidence-based practice gap calling for urgent action on the said matter. On some other studies, there showed research utilization's unpopularity among nurse practitioners [28] focusing much concerns on setting-related barriers and access to electronic databases as major barriers. Language of the article (particularly English) was mentioned in another study that led to a negative appreciation and usability of research results affecting "*empowerment among nurses*" [29]. While in another study, the negative attitude seemed to be rooted on the "*unfavorable competencies for implementing research results in practice*" [30] and not directly on research utilization which intrinsically at that instance may appear a better condition and not an outright rejection of the same. All in all and on the issue of comparison regarding research utilization before and during the pandemic, there seemed to say very little changes and differences but could have showed appreciable increase as maybe because of the need to be aware on practices and innovations that can abate pandemic spread. These findings could lead to professional development which can worked also as continuing medical education of the nurses. The complexity of nursing care requires transitioning from skill-based competencies to research evidence-based practice to provide a high quality of healthcare. In the future where technology will integrate data about patients' treatment plan and research evidence, nurses must be knowledgeable and equipped to address complex clinical issues. Nurses have a key role in planning treatment of patients and will have access to health-related resources. Participation in any research activities could lead to a better condition of health care through the utilization of findings focused on innovative care approaches.

Research Utilization Barriers: On the issue of research utilization barriers, participants of the study showed a moderate level of extent on the general perception on perceived prevailing barriers in the nursing practice. Specifically, the same moderate extent was seen on Factor 2 or the barriers from organizational settings, and Factor 3 or the different innovations or qualities of researches. These two factors will be covered mostly on the succeeding relevant discussions but must be mentioned as well the other two areas that participants rated with very little extent of effect as being barriers to research utilization and will be done for transparencies purposes (e.g., Factor 1 or research skills, values, and awareness, and Factor 4 or communication and accessibility of research). These said barriers come in different forms and affected by different factors [31,32]. In a more detailed description of results concerning research utilization barriers related to "organizational

settings and limitations", nurses seemed to have found time as a major constraint; specifically of having no time to read relevant research materials, and insufficient time to implement new ideas or innovative but applicable research findings. Time was specifically identified as "top-ranked barrier" according to another study [33] which became for their respondents' perception as major obstacle in the integration of reliable research innovations in nursing practice in general.

Consistently, aforementioned barriers were compounded further with two (2) major perceptions of inadequacies like (1) nurse practitioners had no "enough authority" to change current prevailing practice considering new innovations, and (2) results are not even "generalizable" to their own local situation. Dagne & Tebeje [34] research study provided descriptions like "*non-intentional research utilization*" questioning their "*belief towards research utilization*" that must have meant both the process and output. On some other aspects serving as barriers to research utilization in practice, physicians, administration and other staff were felt uncooperative and have even prevented implementation, and the presence of perceived inadequate facilities to support relevant implementable research results. Abuhammad al et al. [35] study conducted in the same middle eastern region concurred the same results even emphasizing that showed the highest concerns on the topic. Duff et al. [22] and Ozga et al. [15] studies showed conforming these barriers results thereby stating the importance of education, hands-on training and knowledge infrastructure to be as critical as active team facilitation by senior nurses and other administration officers who all can make that big difference in overcoming this particular research utilization barriers. Another study plainly stated access to literature as a major problem and its provision as part of professional education may be a way to acquire knowledge and appropriately utilize current innovations [36].

In the pre-pandemic view on research utilization barriers among nurses, contrasting discussions will focus not just on the two factors identified barriers perceived as having moderate effect on the respondents but also will include the two other factors having the least effect according to this same present perception study. In some viewpoints, organization was highlighted as either a leading barrier or included in the list of barriers to research utilization in practice. Organizational members regardless of rank greatly affect reception and perception of research utilization in practice [37]. Additionally, the contextual factors by which organization will utilize (or not utilize) research results in practice depends entirely on internal situation as determined by administration officers implementing policies and even in the possible revisions of the same satisfying organization needs [38]. In a systematic study that covered the years 2000 to 2018 on nurses' barriers against research utilization, "organizational barrier" remained consistent and identified as main barrier over the said time period covering

the publications on five continents focused on nurse practitioners [39]. Consistently with Benton et al. [40], organizational policy issues relevant to the nurses' utilization of research result was not just a barrier identified but a factor affecting the larger issues of universal health coverage as supported by different bibliometric analysis such as this one. In Li et al. [24] study, these two were recognized as main barriers while Mahaki et al. [41] itemized the following in their study: institutional barriers, lack of knowledge, lack of motivation, time management. In addition to time as main barrier, access to internet leading to access to relevant publications as source of innovations in practice was highlighted in CEBECİ et al. [42] explaining the eventual poor utilization of research in among the respondents.

The perception over the belief on research results, inadequacies in research methodologies, inability to ascertain proper action on conflicting research results, and the likes were supposedly addressed by formal education from the undergraduate to postgraduate preparations. Just as it is, one study [43] even highlighted "*higher RN educational achievements has the potential to enhance the RN's ability to provide improved quality of patient care*" proving that it could lessen barriers with higher education [44]. Succeeding study emphasized the necessity for nurse practitioners' capability to seek research knowledge in the same hope to close the gap between theory and practice through application [45]. This same line of thing was blatantly opposed in another study directly stating a condition of "*limited evidence in the relationship between postgraduate study and improved patient outcomes*" [46]. In the last months before the advent of the present pandemic, a systematic review study covering the period 2000-2018 on the same topic mentioned the main themes or categories emerging as results. Shayan et al. [47] stated in that study scanty resources, limited access to information, inadequate staffing, and lack of institutional support.

Other Significant Findings: Analysis of the findings included the test for significant associations to and differences of some identified variables. The study found no association between research utilization and nurses' demographic factors. Conflicting results were found in some studies during the same Covid-19 Pandemic period iterating statistical association of research utilization to age, attitude to EBP and knowledge (pertaining to educational preparation) according to Dagne et al. [18] study. Other factors or variables were identified as well as associated like civil status, and work experience (e.g., referring to number of years in the practice) afforded by the study done by Aynalem et al. [20]. On the other hand, significant association was found between research barriers and some demographic variables. Specifically, personal variables like sex and nationality and professional variables like educational level and years of experience were all found to have significant relationship with the perceived barriers on research and research utilization among the respondent nurse

practitioners. The same results were found in the Abuhammad et al. [35] study focusing on personal variable like age and nationality while additional professional factor was highlighted which is professional experience. Age of respondents when divided between younger practitioners and those more than 10 years in the profession showed to have significant difference in their views on research utilization as emphasized by one study [33]. Exactly it was found out that the younger professionals tended to appreciate more research utilization in the practice and are more open to its application in daily practice which came as the opposite for the other older group.

Pre-covid period published researches showed strong importance and support to the direct use of innovative research results in the nursing practice [32], and even have introduced strategies to empower nurse practitioners on evidence-based practices [44,48]. Though this present study found no factors (personal and professional) correlated to research utilization, contrary was found in some others. In the Yoo et al. [23] study, there was positive correlation of research utilization to beliefs, knowledge of EBP, and the readiness of the organization which in the later discussion will eventually connect with some factors made available in this current study. One personal factor like age and length of professional experience were specifically found to confirm that both did not show significant association [49] corroborating the results of this present study. Another study even proved more identified factors (educational qualification, years of nursing practice, gender, and professional rank) to showing the same no correlation to the research utilization [42,50]. However, there were some variables that showed significant correlation but to a low level like in the study of Forsman et al. [1] identifying work place or work setting, professional role, and sex again. One interesting result from one study showed improved research utilization (e.g., improved EBP implementation), it had no direct effect in job satisfaction, group cohesion, or attractiveness. However, with improved EBP beliefs (e.g., research utilization) had direct effect on improvements in job satisfaction and group attractiveness [51]. These results are very important as any improvement in EBP practices or research utilization in practice, there were substantial indications of improvements in several patient outcomes (Melnyk et al., 2016). Whether there is pandemic or not, improved professional practice leading to better patient care and outcomes are hoped to be achieved. When variables were transformed into its relevant bivariate forms, results of the study tended to present defining features that might shed light on questions associated with known conditions affecting research utilization and its barriers among the respondents. On the research utilization ratings, personal variable like nationality (e.g., Saudi vs non-Saudi) and professional variable like area of assignment (e.g., critical areas vs non-critical areas) presented significant differences. While on research barriers ratings, personal variables

like sex (e.g., male vs female) and nationality (e.g., Saudi vs non-Saudi) including professional variables like level of education (e.g., bachelor level vs post-graduate level) and professional role (e.g., staff position vs managerial or administration officer position) tended to also show significant differences in their views and perceptions on the study focus. Supporting other study showed experience (e.g., beginning professionals were more open to research utilization as opposed to the more senior practitioners who showed more barriers in research utilization), educational level (e.g., those with postgraduate studies saw application of research in practice than those with only the bachelor degree), and professional rank [52].

Summary and Conclusions

In conclusion, overall, this present study confirmed the perception of nurses to research utilization and foremost barriers in implementing research such as from organizational settings (lack of support, time to read, and implementation issues) and personal issues low knowledge and feeling of uncertainty about research results, of research methodological inadequacies, and publication-related issues. The findings also present several factors that could influences nurses and their role in research utilization such as individual and organization factors. This could be useful in formulating strategies to limit or overcome barriers in research utilization. Based on this assessment, programs that can help nurses' ability to implement research-based practice are needed. The willingness and interest of nurses in the present study are proving positive attitudes to deal with the identified barriers. Lack of sufficient knowledge in implementing research-findings is the utmost barriers and necessity in the present study that needs rapid and comprehensible action.

Relevance to Clinical Nursing Practice

With the increasing research activities in the Kingdom, it must be emphasized that its utilization can provide valuable improvement both in the actual practice and general health care delivery. There were mentioned areas of strength in research utilization as practiced especially starting on attitude among nurses. At a greater extent, professionally understanding research and research being both interesting and stimulating must be entertained before those dies out for non-use or missed support. Though at moderate extent, improvements might be done on availability and support, and towards actual research utilization in practice as such will surely intensify changes in health care delivery services. On the other hand, rated highest as the source of barriers in research utilization came as organizational factors whose possible reversal can just be counted upon if and when policies and administrative focus were changed to be more responsive to actual research implementation and applications. The study and the relevant learnings obtained only were hoped and geared towards improving

EBP in nursing practice and general health care delivery at par with the international practice. Consistently, the results are comparable with previously conducted study. It has produced information about research utilization and utilization barriers that could be used in formulating general strategies in implementing research findings or evidenced-based practice in Saudi Arabia whether or not there is ongoing pandemic situation but is especially so when there is.

Limitations of the Study

This study identified some limitations. Foremost, the cross-sectional design of study which limits causality application and consideration. Another, the small sample size and the use of convenience sampling which may result to bias and may not be generalizable to population perspective. Additionally, the study was carried out in a large university hospital considered teaching and research health facility and for this reason might not be applicable to other Saudi hospitals in the Kingdom.

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Authors' Contributions

GMP: Study design, data analyses, and manuscript writing.

RPC: Study design, communications, and IRB documentations.

IMR: Related studies review, manuscript drafting, and analyses.

MSA: Data gathering, and data coding.

JMA: Data gathering, and data coding.

The authors read and approved the final manuscript.

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Availability of data and materials

The datasets obtained and used in this research endeavor may be made available upon request from the primary and corresponding author and conveniently be accessed available in the Synapse Repository with Synapse ID: syn24606750 and DOI: 10.7303/syn24606750.

Ethics approval and research consent

The Institutional Review Board of the King Saud University at the College of Medicine deemed the application to conduct research was consented and approved through Research Project No. E-20-4760 dated 02/09/2020.

Competing Interest

The authors declare NO competing interests whatsoever.

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