Patterns and Obstacles of Provision of Minor Orthopedic Procedures among Primary Care Physicians in Saudi Arabia

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Abstract:

Introduction:
Musculoskeletal disorders are common reasons for consultation with the primary care provider (PCP). For many of these disorders, treatment with minor procedures can bring about rapid and effective response with a very low complication rate. In reality, not many of these procedures are carried out in the primary care facilities in Saudi Arabia and in many other countries around.

Materials and Methods:
A cross sectional study design was chosen. The questionnaire aimed to quantify the number and different types of injections performed by PCPs; to evaluate the level of training and to identify barriers to PCPs performing joint and soft tissue injections in the primary care facilities. This questionnaire was distributed on 298 physicians working in primary care setting in Riyadh.
The absolute frequency and percentages were calculated, and Chi square and ANOVA analyses were calculated and correlation test was done to procedures obstacles and their patterns.

Results:
One hundred and thirty physicians (43.6%) of the respondents have taken orthopedic training during their residency program. Among the respondents who have taken a training period during their residency 115 (88.5%) had orthopedic training for 4 weeks. Only 69 (53.1%) of them -who had training- had performed joint and soft tissue injections during their family medicine residency program. The top reasons cited for not performing the procedures were "Lack of up to date skills" and "limited consultation time" because of work overload.

Conclusion:
Many physicians working in primary care settings in Saudi Arabia refer patients requiring minor office procedures for specialist consultation. Treating patients at the primary care level can be more time and cost effective. These results uncover that there is a big need for improvement in orthopedic and rheumatology training during undergraduate medical vocational training and family medicine residency program.

Key words:
Minor orthopedic procedures, joint and soft tissue injection, Family medicine program, Primary care physician, Training program.

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Introduction

Primary care (general and family) physicians or providers (PCP) play an important role in performing minor office procedures. PCPs have a broad base of general medical training, which allows them to know the indications & contraindications of a given procedure and to know non-procedural treatments for a wide array of conditions. Efficient utilization of available resources -by PCPs- in meeting the needs of patients is very crucial.

Musculoskeletal disorders are common reasons for consultation in primary care settings. [1] Such disorders represent a significant cause of disability and morbidity. For many of these disorders, treatment with minor procedures canresult in a rapid and effective response with a very low complication rate. [2]

Many factors contribute to the apparent discordance between expected and actual procedure provision rates. In a study of Alberta family physicians 91% of respondents reported learning the procedures in medical school or during their training with a smaller percentage learning through clinical practice or continuing medical education.[3] New graduates may simply not feel confident in their technical skills due to lack of exposure during medical school or residency training. The patients' high flow rate at primary care settings may create a practice environment where the doctors are just "too busy". The high effort and cost of buying and maintaining equipment may also be an issue.

An Irish study in 2000 reported that a dramatic drop in referral of minor surgical procedures to specialists occurred after completion of educational programs.[4] These results also supported by Lowy et, al study which showed that an increase in provision of procedures at the primary care level has not been associated with a decline in the quality of care.[5] For those who do not wish to perform the procedures, referring to another PCP who performs procedures is an option which remains relatively unexploited.

We are aware that there is a need for improvement in orthopedic and rheumatology training during GP vocational training and family medicine residency programs. Physicians who work in the primary care setting lack the confidence in managing musculoskeletal problems. Vocational training for GPs, primary care structure, and access to secondary care in Riyadh, are similar to the rest of Saudi Arabia. To date there is little information about the types of injections performed in the primary care setting by PCPs, and the reasons for not providing this service. The present study aims to ascertain the numbers and types of injections performed, to know the current practice and the perceived barriers towards joint and soft tissue injection skills as an example for the minor office orthopedic procedures that can be performed in the primary care setting.

Materials and Methods

The present study is a cross sectional study aiming to determine the current practice of Saudi Arabia PCPs with respect to minor office orthopedic procedures and to determine what self-reported obstacles prevented a higher provisional practice of minor orthopedic procedures. According to core procedural skills for Canadian Family medicine in 2005, the minor orthopedic procedures include knee, shoulder and ankle injection, injection for trigger finger, plantar fasciitis, and tennis elbow, and intra-articular injection.

The collected data include age, sex, qualification, duration of practice and work place. Also included a self-reported questionnaire composed of 22 questions that was built up on Sempowski et al questionnaire and Gormley et al questionnaire.[6,7] This questionnaire was distributed on 298 physicians working in primary care setting in Riyadh.

The questionnaire aimed to (a) quantify the number and different types of injections performed by PCPs in the past year; (b) to evaluate the level of training and how PCPs thought that this training improved their ability and confidence to perform injections. Levels of confidence were measured on a five point Likert scale with response options from "strongly agree" to "strongly disagree"; and (c) to identify barriers to PCPs performing joint and soft tissue injections in the primary care setting. Responses were measured on a five point Likert scale with options varying form "very likely" to "very unlikely".

The absolute frequency and percentages, and Chi-square and ANOVA analyses were calculated and correlation test was done to

procedures obstacles and their patterns. All forms of analysis were tested for statistical significance with confidence interval 95% and significant level P<0.05, using SPSS software version 15.

Results

The demographic characteristics of the sample are summarized in **Table 1** and the sample was matched. The present study is conducted on 298 physicians. One hundred and seventy five (58.7%) were males and 123 (41.3%) were females. Ninety five of the physicians were in the age group of 35-45 years. Statistical analysis using Chi Square test did not show significant difference between different sexes (P value = 0.915). Two hundreds and fifteen (72.1%) of the sample were family physicians and general practitioners without significant difference between different sexes (P value = 0.34), with the rest being residents in training at different levels. A hundred and eleven (37.2%) physicians worked at primary care centers (PCC) belonged to ministry of health without significant difference between different sexes (P value = 0.20).

Table 1: Demographic characteristics of respondents

Chi square test		Gender				Total	P value
		Male		Female			
		No	%	No	%		
Number		175	58.33	123	41.77	298	
Age Group	**25-30**	46	26.40	35	28.46	81	0.91
	30-35	36	20.60	22	17.89	58	
	35-45	56	32.50	39	31.71	95	
	>45	35	20.50	27	21.95	62	
	Total	175	100.00	123	100.00	298	
Qualification	**Family physician**	56	32.00	28	22.76	84	0.34
	Family resident-1st/2nd year	23	13.14	19	15.44	42	
	Family resident- 3rd/4th year	27	15.42	14	11.39	41	
	PCP	69	39.43	62	50.41	131	
	Total	175	100.00	123	100.00	298	
Place of work	**King Faisal Specialist Hospital**	7	4.00	1	0.83	8	0.2
	Military Hospital	56	32.00	32	26.45	88	
	National Guard Hospital	3	1.14	2	0.83	5	
	Primary Care Centers	59	33.71	52	42.98	111	
	Private Clinics/Hospital	14	8	16	13.22	30	
	Security Forces Hospital	16	9.14	11	9.09	27	
	University Hospital	21	12.00	8	6.61	29	
	Total	175	100.00	121	100.00	298	
Nature of place of work	**Governmental health services**	161	92	105	86.8	266	0.14
	Private health services	14	8	16	13.2	30	
	Total	175	100	121	100	296	

The respondents' training background is shown in **Table 2** as 212 (73.1%) of the respondents answered the question; if they have taken orthopedic training during their residency program, 130 (43.6%) respondents stated that they have taken orthopedic training, while 82 (27.5%) respondents stated that they did not. Statistical analysis using Chi square test shows that there is no significant difference between different sexes (P value 0.072). Among the respondents who have taken the training during their residency; 115 (88.5%) of them had taken orthopedic training for 4 weeks, while 12 (9.2%) respondents had taken training for 6-8 weeks, and only 3 (2.3%) respondents had taken training for more than 8 weeks during their residency. Statistical analysis shows that there is no significant difference between different sexes (P value = 0.36). Fifty four (41.5%) respondents who had training during their residency stated that their training periods were enough to learn injection skills, while 76(58.5%) respondents stated that their training was not enough. Statistical analysis shows that there is no significant difference between male and female physicians in this regard (P value 0.82). Among the respondents who had training 69 (53.1%) respondents performed joint and soft tissue injections during their family medicine residency program on the other hand, 61 (46.9%) respondents did not perform any joint and soft tissue injections without significant different between different sexes (P value= 0.76).

The current study also shows in table 2 that 60 (20.8%) respondents of the whole sample had training to perform joint and soft tissue injection in the orthopedic clinics, while 229 (79.2%) respondents did not, without significant difference between different sexes (P value = 0.87).

Table 2: Respondents' training background

Chi square test		Gender				Total	P value
		Male		Female			
		No	%	No	%		
During residency; taken orthopaedic training	Yes	86	49.14	44	35.77	130	0.072
	No	43	24.57	39	31.71	82	
	Not applicable	46	26.29	40	32.52	86	
	Total	175	100.00	123	100.00	298	
Duration of training	4 weeks	75	43.43	40	32.52	115	0.36
	6 weeks	2	1.14	3	2.44	5	
	8 weeks	4	2.29	3	2.44	7	
	> 8 weeks	3	1.71	0	0.00	3	
	Total	84	48.57	46	37.40	130	
Think they had enough time to learn injection skills	Yes	36	21.14	18	14.63	54	0.82
	No	49	29.14	27	21.95	76	
	Total	85	50.29	45	36.59	130	
Performed joint and soft tissue injections during family residency program	Yes	42	26.29	27	24.39	69	0.76
	No	39	23.43	22	19.51	61	
	Total	81	49.71	49	43.90	130	
Had training to perform joint and soft tissue injections in the orthopaedic clinic	Yes	35	20.00	25	20.33	60	0.87
	No	134	76.00	95	77.24	229	
	Total	169	96.00	120	97.56	289	

Joint and soft tissue injections that were performed by the respondents are shown in **Table 3.** Results show that knee injections were the most common injections performed as 48 (16.1%) respondents had performed it. Most of these knee injections 30 (35.7%) were done by the family physicians. Injections for a tennis elbow come in the second order 20 (15.4%). Sixteen (80%) of them were done by family physicians.

Table 3: Types of joint and soft tissue injections

ANOVA test		Family physician		Family resident-first year		Family resident-second year		Family resident-third year		Family resident-fourth year		PCP		GP		Total	P value
		No	%	No	%	No	%	No	%	No	%	No	%	No	%		
Performed a knee injection	**Yes**	30	35.7	1	4.8	6	28.6	1	3.8	6	40.0	4	7.4	0	0.0	48	0.005
	No	54	64.3	20	95.2	15	71.4	25	96.2	9	60.0	50	92.6	78	100	250	
	Total	84	100	21	100	21	100	26	100	15	100	54	100	78	100	298	
Ever performed a shoulder injection	**Yes**	10	11.9	0	0.0	0	0.0	1	3.8	1	6.7	1	1.9	0	0.0	13	0.066
	No	74	88.1	21	100	21	100	25	96.2	14	93.3	53	98.1	78	100	285	
	Total	84	100	21	100	21	100	26	100	15	100	54	100	78	100	298	
Ever performed an ankle injection	**Yes**	10	11.9	0	0.0	0	0.0	0	0.0	2	13.3	1	1.9	0	0.0	12	0.001
	No	74	88.1	21	100	21	100	26	100	13	86.7	53	98.1	78	100	286	
	Total	84	100	21	100	21	100	26	100	15	100	54	100	78	100	298	
Ever performed an injection for a trigger finger	**Yes**	9	10.7	0	0.0	1	4.8	0	0.0	2	13.3	1	1.9	1	1.3	14	0.012
	No	75	89.3	21	100	20	95.2	26	100	13	86.7	53	98.1	77	98.7	284	
	Total	84	100	21	100	21	100	26	100	15	100	54	100	78	100	298	
Ever performed an injection for plantar fasciitis	**Yes**	8	9.5	0	0.0	0	0.0	2	7.7	1	6.7	3	5.6	0	0.0	14	0.012
	No	76	90.5	21	100	21	100	24	92.3	14	93.3	51	94.4	78	100	284	
	Total	84	100	21	100	21	100	26	100	15	100	54	100	78	100	298	
Ever performed an injection for a tennis elbow	**Yes**	16	19.0	0	0.0	0	0.0	1	3.8	2	13.3	1	1.9	0	0.0	20	0.003
	No	68	81.0	21	100	21	100	25	96.2	13	86.7	53	98.1	78	100	278	
	Total	84	100	21	100	21	100	26	100	15	100	54	100	78	100	298	

Shoulder, ankle injections, injections of a trigger finger and injections for plantar fasciitis came in the third order of overall injections and the majority of them were also performed by the family physicians. Statistical analysis to compare different respondents qualifications using ANOVA test shows that there was significant difference as P value was <0.05.

Comparison between certified and non-certified physicians in performing joint and soft tissue injections resulted in: there are significant differences between two groups (P value<0.05) (**Table 4**). These results show the importance of orthopedic and rheumatology training during family medicine programs

Table 4: Comparison between certified and non-certified physicians

Chi square test		Certified family physician		Non-certified physician			P Value
		No	%	No	%	Total	
Performed joint and soft tissue injections during family residency program	Yes	43	62.3	33	45.2	76	0.041
	No	26	37.7	40	54.8	66	
	Total	69	100	73	100	142	
Performed a knee injection	Yes	27	37	21	9.3	48	0.005
	No	46	63	206	90.7	252	
	Total	73	100	227	100	300	
Ever performed a shoulder injection	Yes	10	13.7	3	1.3	13	0.005
	No	63	86.3	224	98.7	287	
	Total	73	100	227	100	300	
Ever performed an ankle injection	Yes	9	12.3	3	1.3	12	0.005
	No	64	87.7	224	98.7	288	
	Total	73	100	227	100	300	
Ever performed an injection for a trigger finger	Yes	7	9.6	7	3.1	14	0.022
	No	66	90.4	220	96.9	286	
	Total	73	100	227	100	300	
Ever performed an injection for plantar fasciitis	Yes	7	9.6	7	3.1	14	0.022
	No	66	90.4	220	96.9	286	
	Total	73	100	227	100	300	
Ever performed an injection for a tennis elbow	Yes	13	17.8	7	3.1	20	0.005
	No	60	82.2	220	96.9	280	
	Total	73	100	227	100	300	

Regarding the obstacles and barriers to perform joint and soft tissue injections **Table 5** shows that the responses of physicians were different according to their background as follows; the family physicians perceived the load of work in the clinic and the availability of good referral system as the main obstacles and barriers to perform such procedures. First year family medicine residents pointed out that lack of up to date skills and the referral system are the main obstacles to perform such procedures.

Finally, PCPs perceived lack of up to date skills and the clinic overload came on top of the obstacles and barriers to perform such procedures. Statistical analysis of comparing the different qualifications of the groups using ANOVA test, shows that there is a significant difference among different groups as the P value was <0.05.

Table 5: Obstacles and Barriers to performing joint and soft injections

ANOVA test		Family physician		Family resident-first year		Family resident-second year		Family resident-third year		Family resident-fourth year		PCP		GP		P value
		No	%	No	%	No	%	No	%	No	%	No	%	No	%	
Lack of up to date skills	Yes	38	45.2	14	66.7	19	90.5	18	69.2	7	46.7	34	63	66	84.6	0.01
	No	46	54.8	7	33.3	2	9.52	8	30.8	8	53.3	20	37	12	15.4	
	Total	84	100.0	21	100.0	21	100	26	100	15	100	54	100	78	100	
The clinic is too busy to perform such a procedure	Yes	59	70.2	7	33.3	10	47.6	16	61.5	12	80	35	64.8	49	62.8	0.01
	No	25	29.8	14	66.7	11	52.4	10	38.5	3	20	19	35.2	29	37.2	
	Total	84	100.0	21	100.0	21	100	26	100	15	100	54	100	78	100	
Don't see patients with indications	Yes	30	35.7	8	38.1	6	28.6	8	30.8	7	46.7	23	42.6	20	25.6	0.01
	No	54	64.3	13	61.9	15	71.4	18	69.2	8	53.3	31	57.4	58	74.4	
	Total	84	100.0	21	100.0	21	100	26	100	15	100	54	100	78	100	
Fees too low	Yes	32	38.1	2	9.5	7	33.3	3	11.5	3	20	19	35.2	70	89.7	0.01
	No	52	61.9	19	90.5	14	66.7	23	88.5	12	80	35	64.8	8	10.3	
	Total	84	100.0	21	100.0	21	100	26	100	15	100	54	100	78	100	
Easier to refer	Yes	63	75.0	12	57.1	14	66.7	11	42.3	9	60	25	46.3	48	61.5	0
	No	21	25.0	9	42.9	7	33.3	15	57.7	6	40	29	53.7	30	38.5	
	Total	84	100.0	21	100.0	21	100	26	100	15	100	54	100	78	100	

Table 6: Correlation between obstacles and pattern of minor procedures

Spearman test	Duration of training		Lack of personal interest		Lack of evidence about efficacy		Concerns about complications		Inability to make correct diagnosis	
	R	Sig. (2-tailed)	R	Sig. (2-tailed)	R	Sig. (2-tailed)	R	Sig. (2-tailed)	R	Sig. (2-tailed)
Duration of Training	1.00	.	0.12	0.18	0.06	0.51	0.13	0.14	0.05	0.59
Performed a knee injection	-0.13	0.13	0.13	0.03	0.02	0.68	-0.01	0.83	-0.17	0.00**
Ever performed a shoulder injection	-0.19	0.02*	0.11	0.06	0.02	0.79	0.03	0.59	0.00	0.95
Ever performed an ankle injection	-0.12	0.18	0.13	0.03*	0.09	0.15	-0.02	0.78	-0.03	0.67
Ever performed an injection for a trigger finger	0.03	0.69	0.17	0.00**	0.10	0.09	-0.03	0.62	-0.02	0.78
Ever performed an injection for plantar fasciitis	-0.03	0.76	0.17	0.00**	0.05	0.40	0.03	0.59	0.00	0.95
Ever performed an injection for a tennis elbow	-0.16	0.07	0.12	0.04*	0.03	0.67	0.03	0.63	-0.02	0.69

***Correlation is significant at the 0.05 level (2-tailed).**

****Correlation is significant at the 0.01 level (2-tailed).**

The correlation between obstacles and patterns of minor procedures is shown in **Table 6**. The present study proved that the time spent during the training to learn such procedures was significant for shoulder injection as P value was 0.02. Lack of interest was a very important factor as it was correlated to most of the procedures, as P value was <0.05. Another factor is the inability to make correct diagnosis, which was correlated with performing knee injections, as P value was 0.005.

Discussion

The present study was conducted on 298 physicians who were working in primary care settings that belong to different health sectors in Riyadh. Physicians working in primary care settings have different qualifications and training backgrounds.

Musculoskeletal disorders are common reasons for consultation in primary care setting. Such disorders represent a significant cause of disability and morbidity. For many of these disorders, treatment with corticosteroid injections or other types of injections can bring about a rapid and effective response with a very low complication rate. [7-10]

Results showed that 61.3% of the physicians included in the study had training for provision of injections during their residency, 88.5% of them their training was for at least 4 weeks but 41.5% of them stated that the training period was not enough to learn how to perform such procedures. This could explain why the physicians did not perform such procedures in the primary care setting. Naismith et al described the importance of teaching minor surgical procedures as an essential component of the family medicine residency curriculum. [11] A systematic, organized and documented procedural skills curriculum at the undergraduate and at the residency level is required. The creation of national recommendations such as those recently published by the College of Family Physicians of Canada procedurals skills working group should help to create a national standard.[12] Results also, show that less than half of the sample (41.8%) did such minor surgical procedures and most of the procedures were done by the certified family physicians. Statistical analysis of the obstacles and barriers that prevented the physicians from performing such procedures in their practice was found to vary from category to another according to their qualification, training background and years of experience. Family physicians perceived the work overload at their clinic and availability of referral system stand behind why they did not perform these minor procedures (if others can do it why should I do it?). While family medicine residents, and PCPs perceived lack of up to date skills and the clinic overload as on top of obstacles and barriers. We believe that those physicians who are in need to update their skills should be targeted for workshops to perform such procedures. Britain experienced a dramatic drop in referral of minor surgical procedures to specialists after completion of educational programs. [4] Furthermore; increased provision of procedures at the primary care level has not been associated with a decline in the quality of care. [5]

Conclusion

Many physicians working in primary care setting in Saudi Arabia refer patients requiring minor office procedures for specialist consultation. Treating patients at the primary care level can be more time and cost effective and may help to reduce the load on the hospitals and help to utilize the services of the specialist when needed. "Lack of up to date skills" and "lack of time" because of work overload, were the top reasons cited for not performing such procedures in the primary care setting.

Recommendations

- Teaching minor orthopedic procedures in a family medicine residency program as an essential part of the curriculum.
- Developing workshops in minor orthopedic procedures to upgrade the skills of post graduates who did not get enough training during their residency programs.
- Accreditation of family practice minor orthopedic procedures training programs should be contingent on institutions of formal CME and maintenance of competence programs.

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