

An Evaluation of the Effect of Physician Assistants on Medical Students and Residents

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ABSTRACT

Objective

Many sites that employ Physician Assistants (PAs) within Manitoba are medical teaching facilities. This study aimed to evaluate medical student and resident perceptions of PAs. Four major topics were addressed in this study; the impact of the PA on the medical learner, the PA role, the competency of the PA, and the overall reduction of workload with a PA on service.

Methods

A cross-sectional questionnaire was distributed to 220 medical students in their third or fourth year, and 150 first year residents enrolled at the University of Manitoba. Participants who self-indicated they had rotated through a service which employs a PA were included in this study.

Results

Results from this study were generally positive. From the perspective of medical learners, PAs were perceived to be competent (83.6%) and promote continuity of care (72.4%). Participants indicated daily interactions with the PAs on service (85.7%) with adequate collaboration (73.5%) and communication (79.6%).

Results regarding the PA role were indeterminate, with only 39.5% of participants having indicated a defined role for the PA on service, while 85.8% had indicated the PA role overlapped with their own. Overall only half (50.1%) of participants felt like the PAs aided in their medical training.

Conclusion

This study showed that PAs have had some impact on medical education, but a clear benefit could not be determined. While PAs in Manitoba are meeting the points indicated in the quality initiatives and resident work hour reduction, there is a considerable disagreement when it comes a defined role and hierarchy of PAs.

INTRODUCTION

What is a PA

Physician Assistants (PA) are part of a class of health care professionals known as Advanced Practice Providers (APP), or Non-Physician Practitioners (NPP), which also includes nurse practitioners (NP) (1,2). PAs are medical professionals qualified to practice team-based medicine. PAs are academically trained under the medical model to work alongside physicians in practice. They are trained as generalists who then practice under the capabilities of their supervising physician (3). This can relate to all medical fields, from primary care to surgical subspecialties. The role of the PA in practice is often dependent on the medical specialty in which they work. The delegated role of a PA practicing in a surgical subspecialty would greatly differ from the role of a PA in primary care practice. Under the scope of their supervising physician's practice, a PA has competences from yearly physical examinations, to performing bedside procedures and assisting in surgery (2). The amount of autonomy also differs in this regard. Autonomy expected from PAs includes their ability to make clinical decisions about patient care on their own, and the prescriptive authority that goes with their clinical judgment (4).

The healthcare system is continually evolving in an effort to advance patient care through quality initiatives. The quality initiatives were designed using management reasoning to generate better outcomes for patients and health care professions by developing continuous improvements in the way health care is managed in hopes to improve its overall quality (5). An important purpose of PAs in Canada and the US has been to improve on the newly introduced quality initiatives. These include improving patient access to care, enhancing the quality of patient care, and reducing overall

physician wait times (5). These initiatives have application in both primary care and specialty medicine.

History of PAs

The PA profession was first introduced at Duke University in 1965 (6). As of December 31, 2015, there were 108,717 certified PAs practicing in the US with rapidly climbing numbers (7). PAs began practice in Manitoba in 1999, and the University of Manitoba opened the Masters of Physician Assistant Studies program in 2008 (3). PA programs differ between states/provinces, but are all 2-year programs that require a Bachelor's degree prior to admission (2). Currently there are over 200 Physician Assistants in Canada (3).

PAs in Manitoba

As of Feb 29, 2016 there were 76 registered PAs in Manitoba, according to the College of Physicians and Surgeons of Manitoba (CPSM) Physician Assistant Register (8). Many sites that employ PAs in Manitoba are teaching hospitals, and therefore the PAs in practice often work alongside medical students and residents, sometimes on a daily basis. As PAs become more pervasive there was a need to evaluate their influence on aspects of medicine outside of direct patient care. Currently there are 4 programs within Canada that offer physician assistant education, however Manitoba is the only province to offer a masters level of education, with their Masters of Physician Assistant Studies (MPAS) at the University of Manitoba, Faculty of Medicine (9). The MPAS program is comprised of 24 months of medical education, divided into 12 months didactic, and 12 months clinical rotations. After the clinical year, MPAS students are required to complete the Canadian certification examination in order to become Canadian

Certified Physician Assistants (CCPA). Currently the majority of PAs within Manitoba are largely employed in medical and surgical subspecialties.

Background

To date, there is limited research examining the impact that PAs have on the medical student and resident's education. The PA-resident relationship has been addressed in previous studies by collecting information from PAs, NPs, medical directors, and residents, but none to date have incorporated medical students on clerkship rotations. As medical students in their third and fourth year of study and first year residents have varying degrees of medical knowledge, which is expanded with each additional year of education, we will discuss them as a group entitled medical learners for the purpose of this paper.

The view of APPs in practice and their impact on medical education described in previous studies has been diverse. These results are generally positive, however the quality of result was dependent on whom the study population was targeting. An American study by Khan et al. reported on how APPs affected the medical resident's education experiences, level of workflow, and patient care (10). The study was conducted by distributing a questionnaire to residents in accredited general surgery programs asking them to assess the impact of APPs on their resident training within intense care units (ICUs) (10). Their results were mixed in regards to whether the implementation of APPs on the medical service was beneficial or detrimental on medical learning. Bahouth's 2007 study reported that the use of NPs in graduate medical education, led to a relief in workload for the residents, and overall, found the inter-professional collaboration a positive experience (11). However, Bahouth's study was

conducted by face-to-face interviews with licensed NPs employed by the University of Maryland Medical Center, and did not directly engage responses from the medical learners themselves. In Buch's 2008 paper, they distributed questionnaires to both residents and NPPs at the Mount Sinai School of medicine Surgical Residency program in New York, USA. They wanted to understand the impact of NPPs on surgical resident education and if it changed the resident's learning experiences. Identical questionnaires were distributed to the surgical residents and NPPs and results were compared side-by-side (2). They reported that 96.4% of NPPs and 84.8% of residents agreed that the reduced resident workloads (2). A similar study conducted by Joffe's in 2014, assessed the impact of APPs on fellowship training in critical care units from the perspective of the program directors. To do this, questionnaires were sent to the program directors of accredited medical-education fellowship training programs. The program directors were asked to assess the utilization of APPs within these programs, and evaluate their consequent impact on fellowship education (1). Program directors from surgery, anesthesiology and internal medicine subspecialties responded to this questionnaire, and indicated that they perceived patient care was positively affected by implementing APPs in their critical care settings. Additionally, they found that APPs positively impacted the fellowship training by saving time during rounds and by maintaining communication and continuity of care (1).

Research has also been conducted on the integration and perceived level of qualification of APPs. Riportella-Muller et al. reported that the introduction of APPs lead to professional rivalry involving confusion over the qualifications and roles to be preformed by the NPs and PAs (12). This is likely related to the fact that Riportella-

Muller's paper assessed APPs which were used as resident replacements due to the decreased number of resident training positions available. They did not assess APPs working as physician extenders, but rather direct resident replacements. Their questionnaires were sent to medical and program directors of 391 hospitals within the council of teaching hospitals (COTH), and were completed by directors, attending physicians, secretaries, administration and supervisors (12). Resident opinions were not collected for this study. Moote et al. also assessed the level of resident substitution for PA and NPs, and their associated clinical roles. They asked 26 University HealthSystem Consortium (UHC) of which 21 (81%) reported that PAs and NPs were used as resident substitutes. When asked the level of substitution the PAs and NPs were being used for, the results stated that 14% of PA and NPs were used as postgraduate year 2 (PGY-2) resident substitutes, 33% of PAs and NPs were used as PGY -3 and PGY -4 substitutes, and 31% of survey respondents did not know the level of functioning of their NP/PAs in equivalence to the PGY scale (13).

Two additional important questions were addressed in Buch's study, the comparable skill level of the NPPs, and clarity of their role. The residents in Buch's study reported that 7.9% considered NPPs to function at the level of a senior resident, 68.3% as an intern (junior resident), and 22.2% below the level of intern (med student), while none (0%) reported that NPPs functioned at the level of an attending, and only 1.6% reported they functioned as a chief resident (2). The NPPs in Buch's study believed their functioning capacity to be much higher, as 7.1% indicated that they function at the level of an attending physician, 35.7% as a chief resident, 32.1% as a senior resident, 25% as an intern, and none (0%) reported functioning at a level below an intern (med student)

(2). When the participants were asked about the NP/PA role and if it was clearly defined within the service, 78.6% of NPPs agreed/strongly agreed their role was defined, while only 67.2% of residents agreed/strongly agreed about the same (2). In contrast, when participants within the same study were asked to remark if there was a clearly defined hierarchy with the PA/NP on service, a more equal response of 60.7% of NPPs, and 60.6% of residents agreed/strongly agreed (2). This suggests that the NPPs role is fairly clear, and more so than the hierarchy on service.

HYPOTHESIS

PAs have been implemented into medical practice within multiple sites in Manitoba for a sufficient period of time to make an impact on both patients and on interdisciplinary medical teams. Since the introduction of PAs in Manitoba, no studies have been conducted evaluating the role of the PA in medical education from the view of the medical student/residents.

This study aimed to evaluate the efficacy of PAs in medical student/resident training and education. As well as assess the perception of the PA profession amongst medical learners. The study aimed to assess four major topics, some of which apply to the quality initiatives. The function/role of PAs in their medical fields from the perspective of the medical students/residents, the associated competencies in this role, the degree to which PAs are involved in medical student education, and the overall reduction of workload with the introduction of the PA. The investigators in this study expected a positive outcome from this questionnaire, based on the results from previous studies conducted in the US. We anticipated that PAs have had a positive impact on medical learner education by increasing communication and decreasing workload, and that after

over a decade of practice within Manitoba, this study was predicted to reveal a clearer role and hierarchy than demonstrated in previous studies.

METHODS

Participants

This study used a cross-sectional questionnaire design. All medical students and residents enrolled in medical school year three (M3), medical school year four (M4), and post-graduate year one (PGY1) at the University of Manitoba were contacted to participate. Participation was voluntary, no incentives were offered, and informed consent was implied. The study was approved by the institutional Research Ethics Board at the University of Manitoba.

Eligibility was determined on the basis of exposure to PAs within the current academic year. Students who identified themselves as having completed or were currently completing a rotation on a ward or service that employed a PA were included in the study.

The University of Manitoba accepts 110 students annually to faculty of medicine. Therefore, between M3 and M4, 220 medical students were potential participants. This was assuming all 110 students accepted into the medical program annually had reached the third and fourth year of their education. In addition, the Professional Association of Residents and Interns of Manitoba (PARIM) confirmed 150 eligible PGY-1 residents. The final participant pool was calculated as 370 students. It was estimated 50% or more students would have had exposure to a PA. With an additional anticipated response rate of 50%, approximately 90 students (24%) were predicted to complete the questionnaire.

Apparatus or Materials: *Questionnaire*

The questionnaire was created using modified questions from Bahouth's 2007 study directed at NPs impact on medical student education, Joffe's 2014 study on the impact of APPs employed in academic medical centers, and Buch's 2008 study which focused on APPs in surgical specialties (1, 2, 11). In addition to this, the investigators developed several questionnaire items to further gather information on the role of PAs in Manitoba specifically, as they were the target population for this study.

Bahouth's questionnaire focused on the competency and the role of NPs in practice (11). The questions taken from the Bahouth questionnaire were revised to address the competency and role of the PAs in practice in Manitoba from the perspective of the medical learners. Joffe's questionnaire addressed APPs impact on medical education, reduction of resident workload, and the APP role (1). Buch's questionnaire addressed all four issues listed above (2). Much like the questionnaire from Bahouth's paper, Joffe and Buch's questionnaires were altered to address PAs specifically, but the content of the questions remained the same. Together these three previously published questionnaires were able to capture the four main categories focused on in this study.

Data collection was limited to a 30 item participant questionnaire. A 5 –point likert-type scale was used for 22 questionnaire items. The scale was anchored; 1 - *strongly disagree*, 2 - *disagree*, 3 - *neutral*, 4 - *agree*, and 5 - *strongly agree*. A sixth option was provided, '*prefer not to comment*'. The remaining questions consisted of 6 multiple choice and 2 fill in the blank.

The questionnaire was created online, using SurveyMonkey software. For the data collection in this study, the questionnaire was set to anonymous, which means no IP

addresses, personal email addresses or participant locations were recorded.

Procedure

Participants were emailed a consent form containing a link to the 30 -item questionnaire on SurveyMonkey software. They were emailed through their respective programs, UGME, PGME and PARIM using mass email lists. The questionnaire was set to anonymous prior to distribution. The consent email asked all M3, M4 and PGY-1 level medical learners who had rotated through a medical service that employs a PA in the current academic year to participate. The questionnaire was conducted online only, and involved no personal interactions with the participants.

Emails containing the link to the questionnaire were sent out at 0, 1 and 2 week intervals to remind students to participate in the study. The data collection concluded one week after the last email reminder had been sent, allotting 3 weeks total for data collection. SurveyMonkey allowed each participant to respond only once to the questionnaire. Once they clicked on the link, M3, M4 and PGY-1 learners had access to the first page of the questionnaire. The first page consisted of one question, which again asked the participants if they had been on service with a PA during the current academic year. If the participants responded no to this question, they were exited out of the questionnaire, and were excluded from the study. If the participants answered yes, they gained access to the second page of the questionnaire, which contained the remaining 29 questions. The 29 questions focused on four major topics. The questions assessed four major themes, however were not placed into sections corresponding to each topic of interest. Eight questions focused on PA impact on medical education, three focused on

PAs reducing medical learner's workloads, seven focused on PA competency in practice and eight focused on the PA role within the medical services.

Statistical Analysis

This study is descriptive in nature and therefore no comparisons were made. Data analysis largely consisted of calculating medians, frequencies and ranges to determine the majority response through valid percentage calculations. As stated above, the 5-point likert-type scale presented in 22 questions, had a sixth option of choosing '*prefer not to comment*.' If chosen, the response was not included in the results in order to generate the valid percentage.

RESULTS

Three hundred and seventy students were contacted for this questionnaire. Of the 370 students, 60 (16.2%) responded. This was lower than the estimated response rate of 90. Of the 60 responses, 11 participants indicated they had not been on a service with a PA and therefore were excluded. This resulted in a total of 49 responses, of which 18 (36.7%) identified themselves as M3, 11 (22.4%) as M4 and 20 (40.8%) as PGY-1 (*figure 1*).

Exposure to PAs varied among participants. Responses ranged from 1 to 9 rotation exposures to a PA within the current academic year, with an average of 2.9 rotations. Participants were asked to identify up to 3 of these services. Twenty-one (21%) of responses indicated Neurosurgery, 18 (17.4%) Pediatrics, 13 (12.6%) General surgery, 11 (10.6%) Emergency medicine, 8 (7.8%) Plastics and 7 (6.8%) Orthopedics. Various other services comprised the remaining responses (24.3%), including family medicine, thoracic surgery, urology, psychiatry, vascular surgery and ACSS (*figure 2*).

The PA role

The results received from participants about the PA role were the most important results generated from this study. The overlap between the PA role and medical learner was assessed, in addition to the effect it has had on the hierarchies within the medical service. When asked, 85.8% (n=42) of participants indicated that the PA role overlapped with their own, with a median of 4. However, when asked to report if there was a clearly defined role for the PA on service, the results varied widely, 39.5% (n=15) indicated agree/strongly agree, 31.6% (n=12) indicated disagree/strongly disagree, and 28.9% (n=11) indicated neutral. Further, when asked to identify if there was a clearly defined hierarchy with the PA on service, the results were more centered on neutral, reported by 42.1% (n=16) of participants with a median of 3. We asked the participants to comment on how the PAs function within the departmental model as a whole. They were allowed to select as many responses as applied. Forty-one (85.4%) participants responded that the PA was apart of the team with the residents, 32 (66.7%) responded that the PAs primarily have patients and/or rotated admissions with trainees, 28 (58.3%) responded that the PAs presented patients on teaching rounds, 20 (41.7%) indicated that the PAs were often supervised by other trainees (residents or fellows), and 11 (22.9%) of participants indicated that PAs performed independent procedures (*figure 3*).

To determine the efficacy of the PA role, we asked participants to assess if the PAs had sustained a role in the quality initiatives, and continuity of care. Over half of the participants (58.7%) indicated they agreed/strongly agreed that the PAs take part in the quality initiatives and only 6.5% (n=3) of participants disagreed. When asking the

participants if the PAs on service promote the continuity of care, 72.4% (n=34) of participants agreed/strongly agreed with a median of 4 (*figure 4*).

PA Impact on Medical Education

The participants were asked to quantify the level and nature of their interactions with the PAs. When on service with a PA, the majority of participants (85.7%) indicated that they interacted with the PA(s) on a daily basis. When asked if the PA(s) on service aid with the medical student/resident's training, half (50.1%) of participants stated they agreed/strongly agreed. Similarly, more than half (53.2%) of participants reported that PAs took part in didactic discussion during rounds or conferences. Alternatively, responses were more varied when asked whether PAs directly contribute to clinical education, with near equal positive, neutral, and negative responses, 32%, 29.7%, and 38.3% respectively.

In addition to evaluating PAs' potential contribution to training and education, the potential adverse effects were assessed. The response to the degree to which PAs are perceived as taking learning opportunities away from participants varied. Primarily it was perceived that they do not, as 45.8% (n=22) indicated disagree/strongly disagree, 20.8% (n=10) neutral, and 33.4% (n=16) agree/strongly agree. Elaborating on the previous results, over half (53.1%) of participants indicated that PAs preformed procedures traditionally done by fellows/residents/medical students.

To assess collaboration, the participants were asked if there was a clear level of communication between themselves and the PAs on service, and 79.6% (n=39) of participants reported they agreed/strongly agreed with a median of 4. Furthermore 73.5%

(n=36) of participants agreed/strongly agreed that adequate collaboration between themselves and the PAs occurred while on service (*figure 5*).

Reduction of Workload

Participants' perceptions of workload reduction while on service with PAs were investigated. When asking the participants if the PAs on service saved time during medical rounds and the evaluation of new patients 70.8% (n=34) of participants agreed/strongly agreed with a mean response of 4. In addition, medical practitioners spend a considerable amount of time communicating with other members of the healthcare team and patients' families. When asked if the PAs aid in this process, 65.3% (n=32) of participants agreed/strongly agreed. When asked to comment on whether PAs reduce overall medical student/resident workload, 79.6% (n=39) of participants agreed/strongly agreed that their workload was reduced (*figure 6*).

Level of Competency

Participants were requested to rate the clinical competence of the PAs by reflecting on their observations of the PAs in practice. Forty-nine percent (n=23) of participants stated that the PAs were very competent, and 36.7% (n=18) of participants stated that the PAs were somewhat competent (*figure 7*). Further engaged to comment on whether or not PAs were able to answer the participant's clinical questions about direct patient care, 76.6% (n=36) reported that they agreed/strongly agreed that the PA was capable, with a median of 4. As an extension to the previous questions, participants were asked if the PAs on service expedited the ability to get prompt answers to their clinical questions. The participants' responses were generally either positive or neutral, 60.4% and 31.3% , respectively.

To assess participants' perceptions of PA-patient interactions, participants were asked if they thought patient/family satisfaction had increased with the addition of the PAs on service, for which the majority of respondents (56.3%) were neutral, median of 3. However, the remaining responses were primarily positive (agreed = 37.5%). To further determine the overall satisfaction of the PA-patient interaction, participants were asked to comment on perceived patient satisfaction when patients' questions were answered by a PA. This resulted in a more positive response rate of 73.5% (n=36) reporting patients were satisfied/very satisfied with a median of 4 (*figure 8*).

The participants were requested to rate the PA clinical competency by comparison to a level of which they most closely functioned. The participants were divided, but majority indicated the PAs functioned at the level of a resident, 65.3% (n=32) indicated junior resident, and 22.4% (n=11) indicated senior resident. Additionally 10.2% (n=5) had indicated the PAs functioned at the level of a medical student and 2% (n=1) indicated the PAs functioned at the level of an attending physician (*figure 9*).

DISCUSSION

This study was designed to elicit medical learners' perceptions regarding the functionality of PAs and the impact of PAs on their learning environment. The majority of results generated in this study reflected positively on PAs, but they also provided insight into potential deficiencies. Most markedly, defining the PA role and establishing a hierarchy.

When comparing data between our results and the studies we derived the questions from, we only discuss the comparative results from Buch and Joffe's study (1,

2). This is because Bahouth's study was largely open-ended and was not placed on a dichotomous or likert-scale and we therefore cannot accurately compare results (11).

The PA Role/Competency

The results of this study presented a similar predicament to previous studies when it comes to the perception of the PA role and hierarchy. In addition to a broad and varied result to the questions pertaining to PA role and hierarchy, a comparison made to previous studies shows the results of the present study are nearly half. This understandably associates to the historical timeline of PAs within the USA and Canada. PAs have only been established within Manitoba since 1999 while they have been implemented in the medical system in the USA since 1965. Justifiably, the profession is still relatively new within Manitoba and it will take more time to set defined boundaries to the PA role. Additionally, educating other healthcare providers when it comes to the PA role could possibly provide clarity, and resolve any uncertainties. In line with the uncertainty towards the PA role, the results in response to the hierarchy of the PA on service were also below the values demonstrated in previous studies. This could reflect on the high degree of variability of the PAs, and the positions they hold on different services. The expected function of a PA in general practice in a primary care setting may be closer to that of an attending physician, whereas the expected function of a PA in a specialty surgical practice may be closer to that of a resident. The hierarchy differences between services was not assessed in this study. The anticipation is that time and experience will likely produce more equivalent results in the future.

An important part of defining a role is determining the level of function. In Manitoba it has not been stated that PAs are resident replacements, but often work on

medical services with similar expectations. Therefore it was important to determine the perception of functionality of the PAs from the perspective of the medical learners they share the service with. The comparable level of skill of PAs, and their equivalence to a level of medical learner, was addressed. The results from this study provided similar, but slightly more positive, results than previous studies. This study revealed that the majority of PAs on teaching sites within Manitoba function at the level of a resident, while minority function at the level of a medical student, and rarely, an attending physician. These results were more positive than the resident reported results from Buch's study, but less positive than the NPPs self-evaluated results (2). When comparing only medical learner results between the studies, a similar number of participants indicated that PAs function at the level of junior resident, however more participants within our study selected senior resident than within Buch's study (2). Joffe's study, which focused on the PA role from the perspective of the program directors, also did not generate as high of a response as our study did and further indicating that there was generally less responsibility towards patient care by the PAs (1). This not only reflects the high level of competence expected of a PA within Manitoba, but also indicates that there will likely be a more defined role with clearer expectancies within the near future. This is estimated from the greater degree of consensus regarding the equivalence of PAs and residents than seen in previous studies.

PA Impact on Medical Learners in Manitoba

In our study, students were asked to report on the inter-profession relationship between PAs on service and their medical learning environment. Medical learners reported a high degree of collaboration and communication between themselves and the

PAs on service. This suggests that the PAs on service take part in the concept of team-based medicine. However the remainder of the questions assessing the learner-PA relationship were divided. Majority of the agree/strongly agree results to these questions were in the 50% range, however there was not a comparable negative response with most remaining students selecting neutral. Therefore approximately half of the participants consider PAs to contribute to their medical training, participate in rounds and didactic discussion. Over half of participants indicated that PAs preformed procedures traditionally done by the learners, however less than half indicated that PAs took away their learning opportunities. Therefore PAs may not directly play an active role in the medical learners educations, but the PAs were also not perceived to inhibit it.

Workload, Continuity of Care and the Quality Initiatives

This study aimed to assess whether or not the PAs in Manitoba were integrating into their intended role within the quality initiatives. In addition to reducing the medical learner workload, PAs play a large role in the quality initiatives of healthcare. Participants in this study suggested that the PAs in Manitoba take part in the quality initiatives, by indicating that PAs help promote continuity of care and improve communication and collaboration. The results in regards to the quality initiatives were more positive in this study than in the previous studies by Buch and Joffe, if we only compare medical learner responses (1, 2). Buch and Joffe's results were overall greater than ours if you include responses by the program directors and the NPPs themselves. This provides an encouraging outlook that program directors, PAs and medical learners all believe that PAs aid the quality initiatives.

To date, most studies conducted in medical teaching facilities focused on the reduction of workload, especially since the implementation of the 80-hour work week maximum (2). This study found results similar to previous studies that PAs are perceived to reduce overall workload. This is a favorable result, suggesting that PAs are useful in reducing resident work hours. Assuming that part of the intention of implementing PAs in the various sites within Manitoba had the desirable outcome of reduced workload for medical learners, it appears to have been a success.

This study did not differentiate between the different learning sites nor did it specifically focus on surgical or medical sites. This may provide an alternate explanation for the degree of variability reported in this study. However, with majority of participants reporting that there is a clear communication, and the majority reporting there is adequate collaboration between the PAs on service and the medical learners, a greater impact of PAs on medical learner education in the future is to be expected. Additionally, this collaboration and communication will be important components for establishing more defined roles in the future.

CONCLUSION

This study was the first study conducted in Manitoba that focuses on the PA – medical student/resident relationships. This study found that the implementation of PAs on medical teaching sites in Manitoba has had an overall mixed benefit on medical education. It has not directly benefited medical teachings, however it has decreased the medical learner workloads and has helped maintain the work-hour reductions. There was also no overt indication that the PAs on service inhibited medical education by taking learning opportunities away from the learners. The PA role and hierarchy produced even

more divided results than previous studies, indicating Manitoba has some greater deficits greater than America where PAs have been in practice for over 50 years.

The amount PAs participate in inter-profession team-based medicine and the quality initiatives was an overall positive result within this study. Although there is not a clear role or hierarchy for the PAs from medical learner perspective, there was definite impact with promoting collaboration and continuity of care.

In summary, this online questionnaire-based study was the first of its kind in Manitoba to assess the PA-medical student/resident learner relationship. It focused on the impact of PAs in practice, and assisted in furthering the PA-learner relationship, by creating an understanding towards interdisciplinary professional education.

Limitations and Future Studies

When discussing the results from this study, it was evident that a subjective survey is going to generate independent opinions in reference to individual experiences. Participants of this study had indicated that there are deficits in the role of the PA that likely should be addressed within future practice. Future studies many focus on specific specialties and the PAs on their service, or PAs who have been in practice for greater than 5 years. This study evaluated all PAs within Manitoba on teaching services, roughly half of which are within their first 5 years of practice. Therefore it is anticipated participants in future studies may reflect greater outcomes after an additional 5 years in practice.

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FIGURES

Figure 1: Participant Population. *Participants were asked to indicate which level of training they were currently in.*

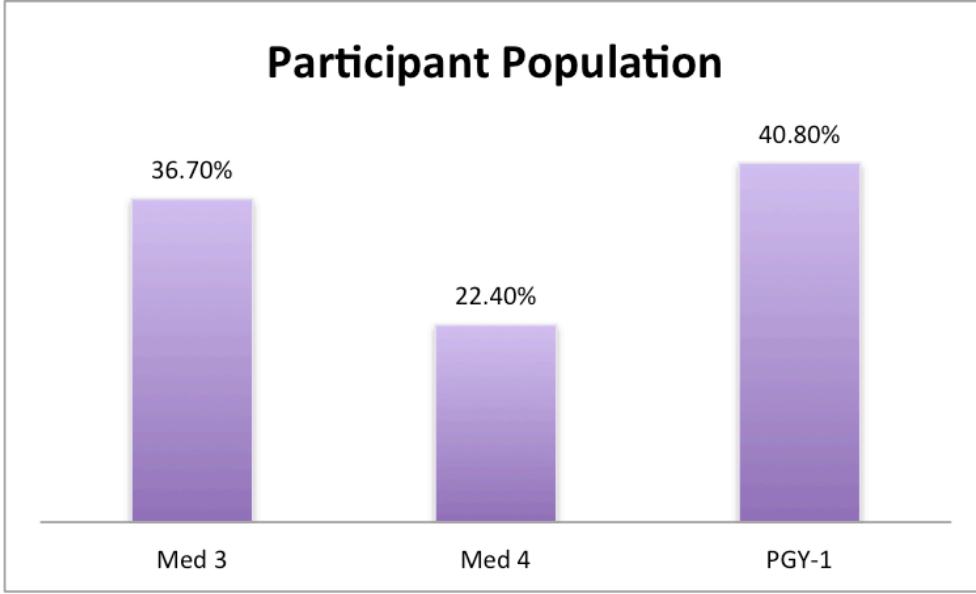


Figure 2: Medical Teaching PA exposure Sites In Manitoba Indicated by Participants. *Participants were asked to identify up to three services they had exposure to a PA on within the current academic year.*

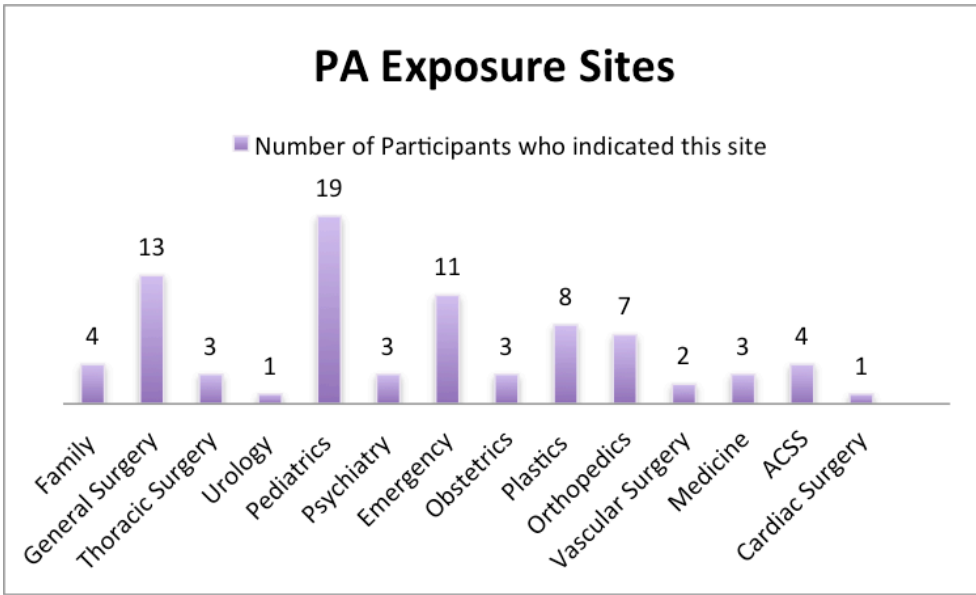


Figure 3: How PAs function within the Department Model. *Participants were allowed to select as many options as applied to the PAs they interacted with on service.*

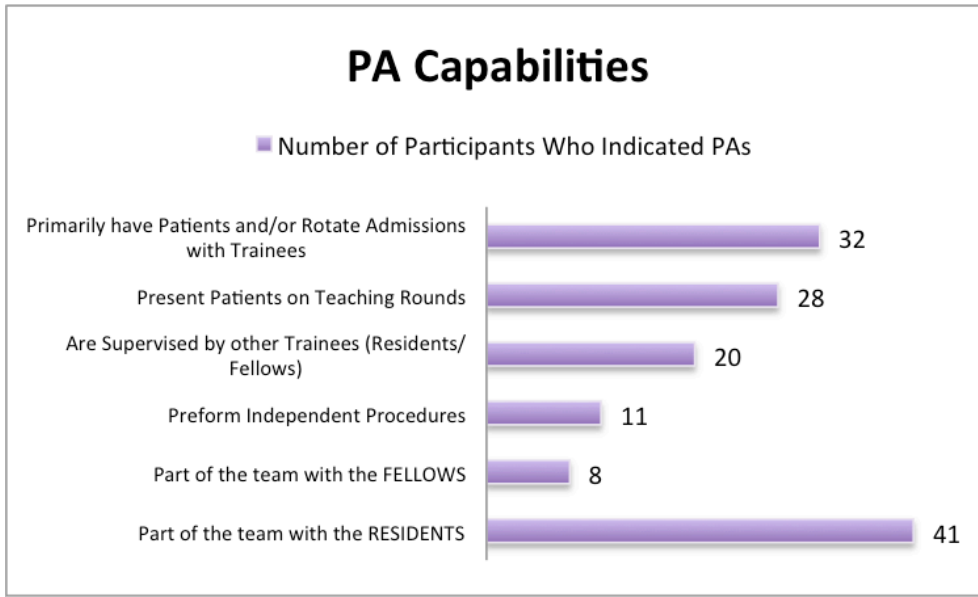


Figure 4: The Perceived PA Role. Below are results from the questions pertaining to the perceived PA role on service. They were compressed into three categories from the 5-point likert-type scale, disagree/strongly disagree, neutral, and agree/strongly agree.

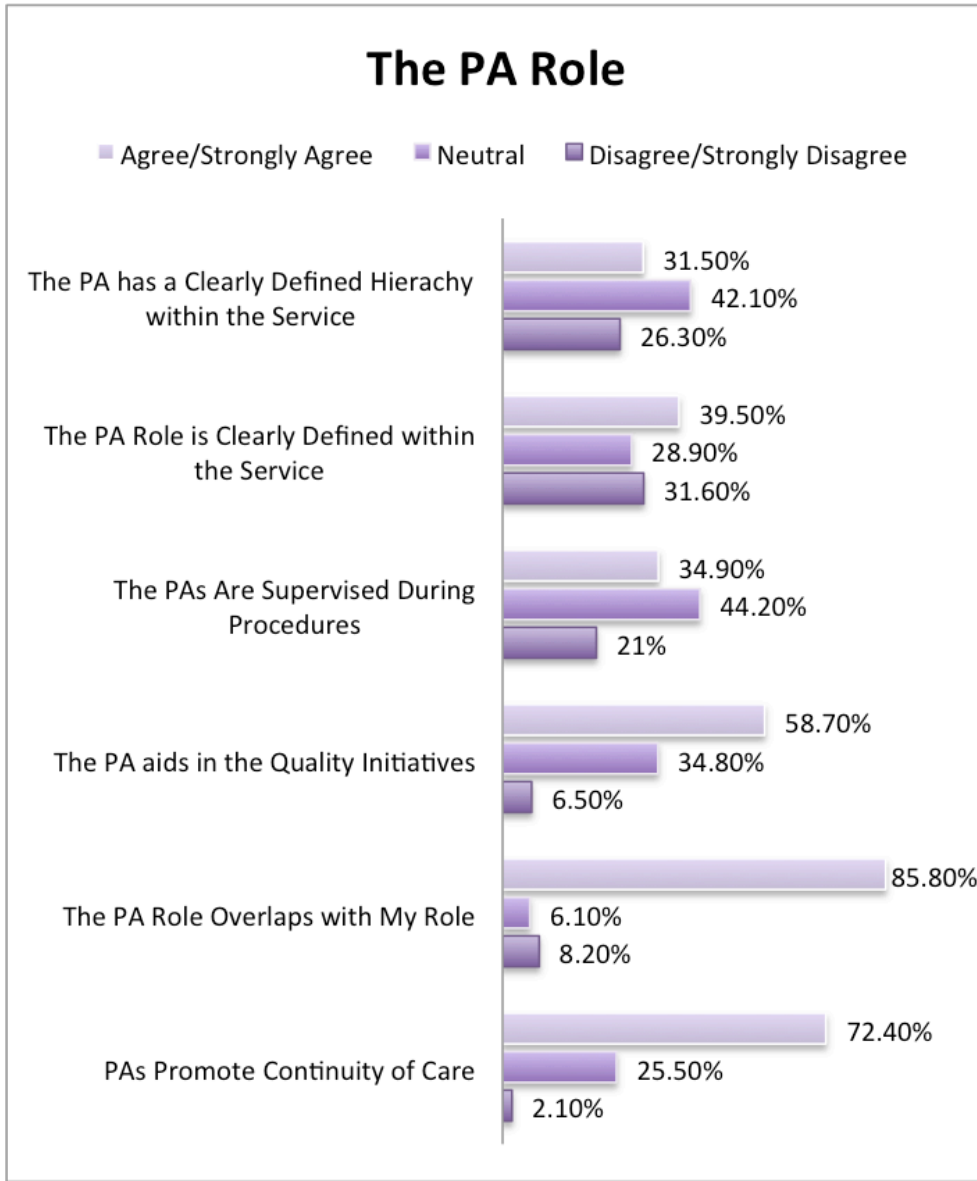


Figure 5: Perceived PA Impact on Medical Education. *Below are the overall results from the questions pertaining to the PA impact on medical learner education. They were compressed into three categories from the 5-point likert-type scale, disagree/strongly disagree, neutral, and agree/strongly agree.*

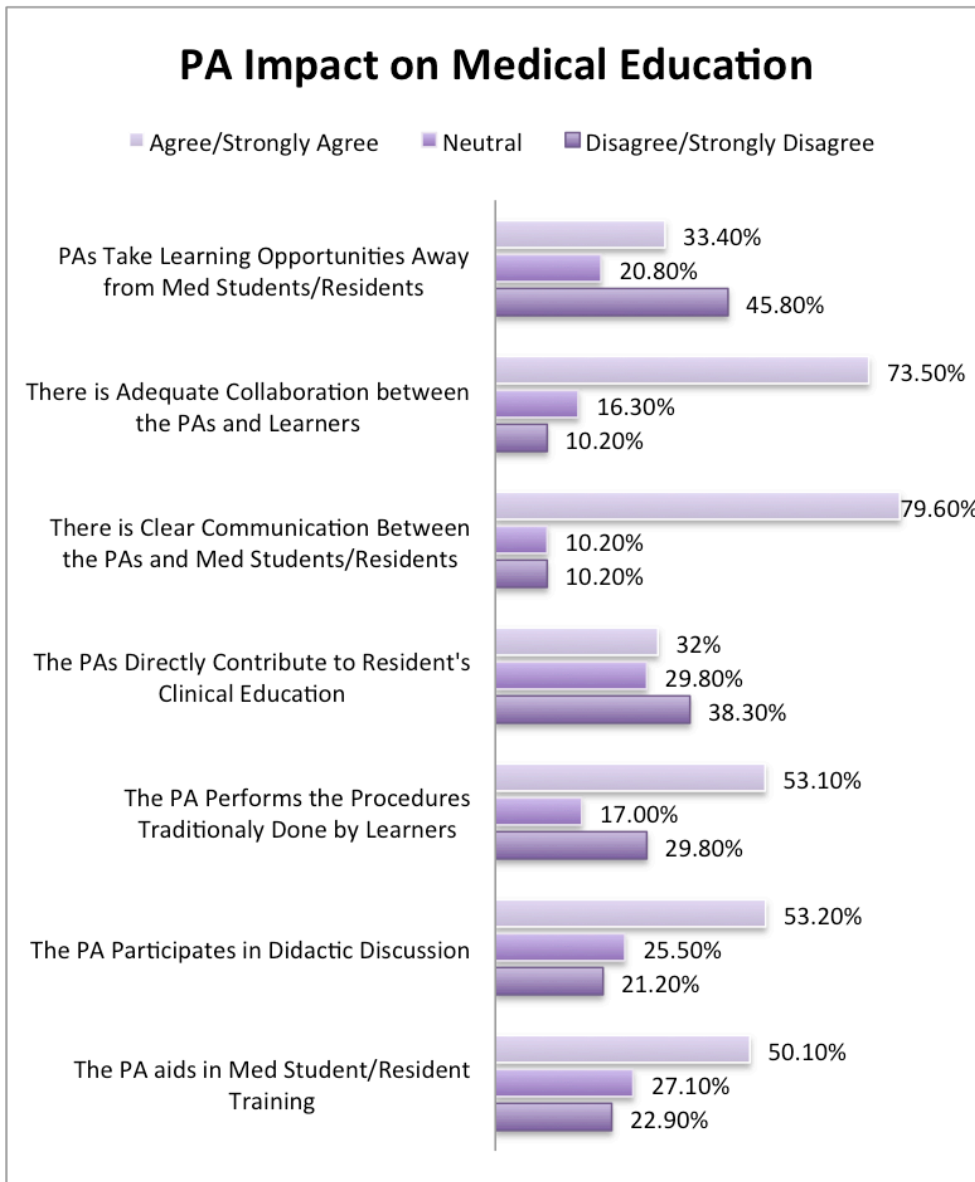


Figure 6: Perceived Reduction of Workload with a PA on Service. *Below are the overall results in regards to reduction of workload. They were compressed into three categories from the 5-point likert-type scale, disagree/strongly disagree, neutral, and agree/strongly agree.*

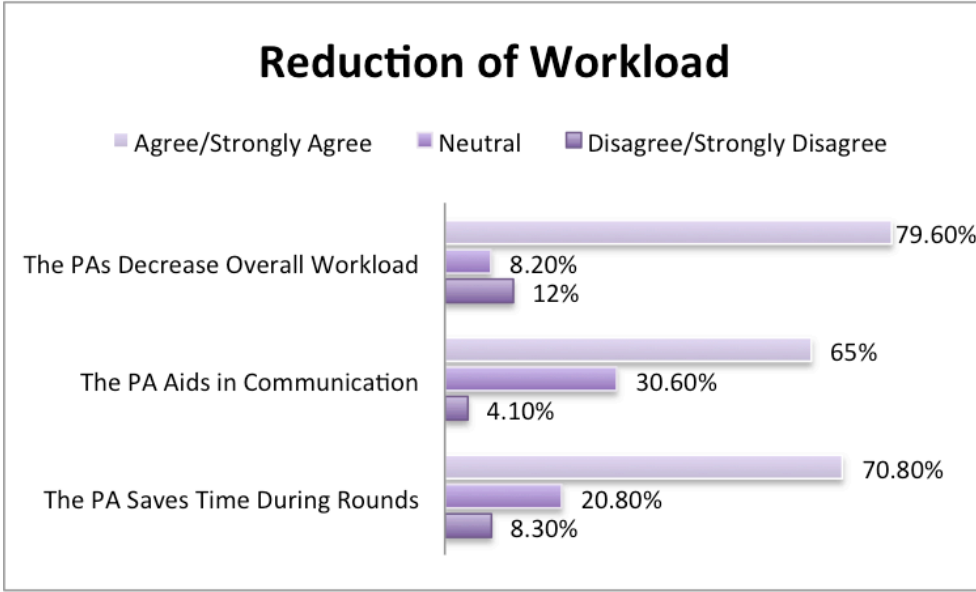


Figure 7: Overall Perceived Clinical Competence. *Participants were asked to indicate perceived level of clinical competence of the PAs on service.*

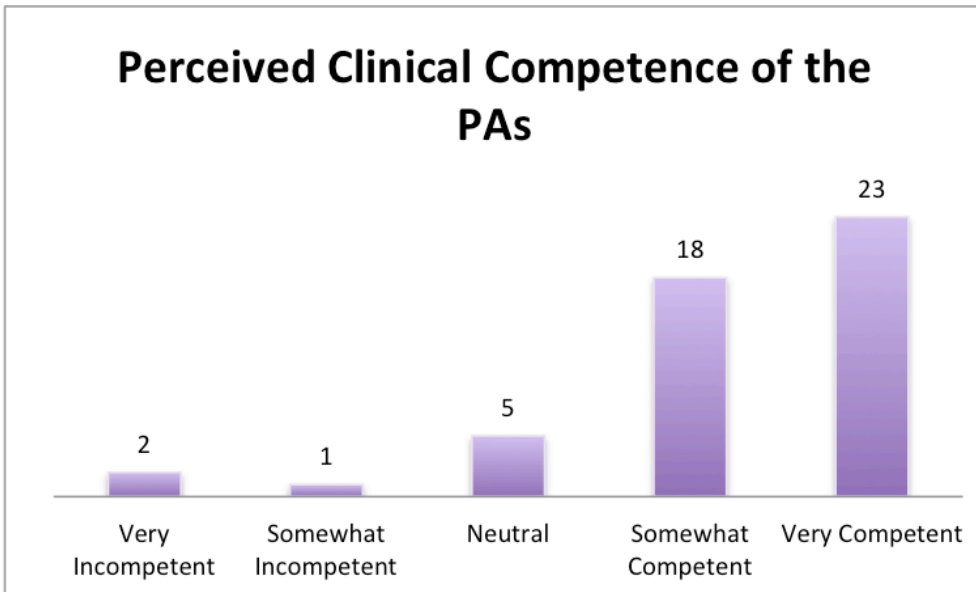


Figure 8: The Perceived Clinical Competency of the PAs in Daily Interactions. *Below are the results from the questions pertaining to PA competency. They were compressed into three categories from the 5-point likert-type scale, disagree/strongly disagree, neutral, and agree/strongly agree.*

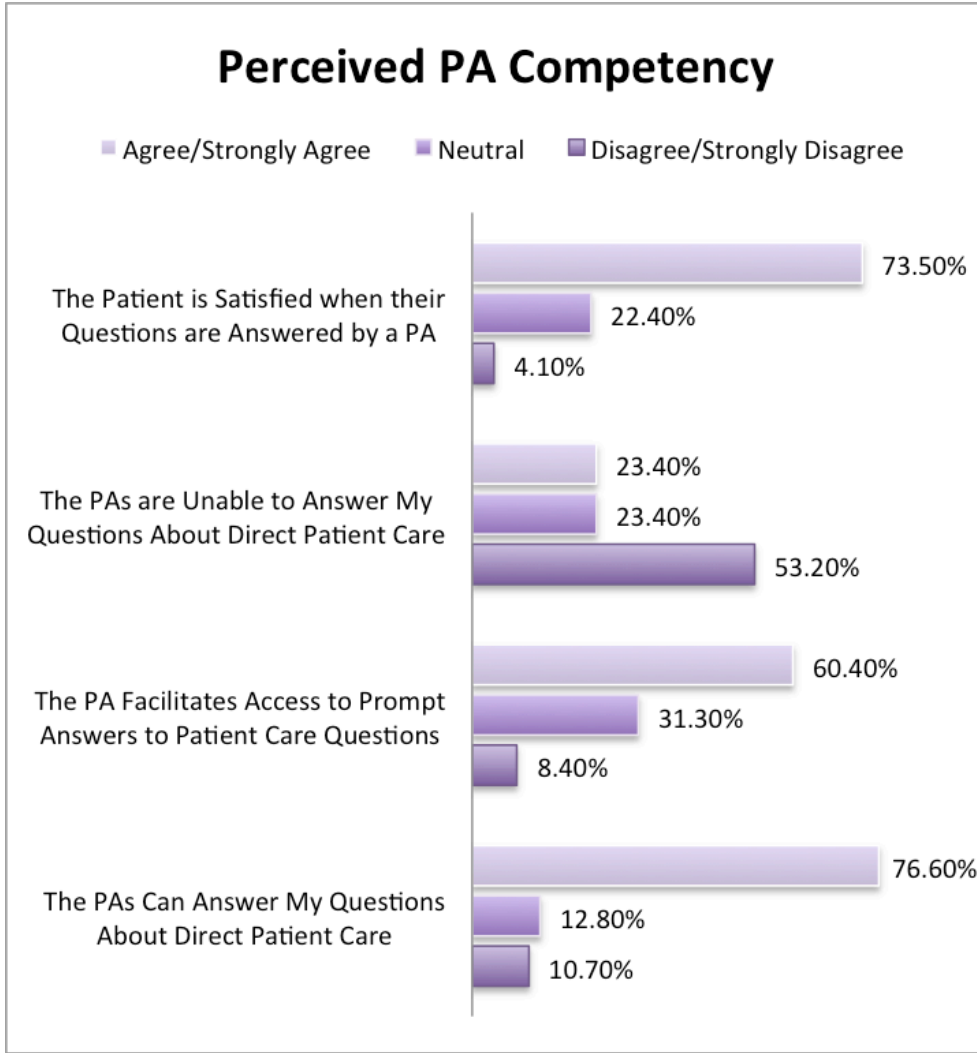
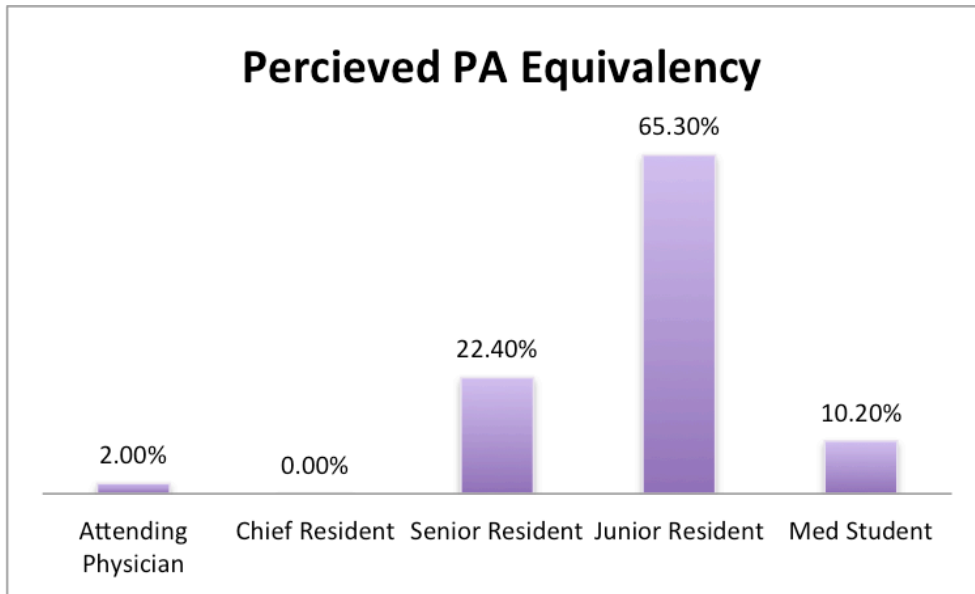


Figure 9: Level of Functioning of PAs on Service. *Participants were asked to equate the level of function of the PAs on service to that of a medical learner.*



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APPENDIX A: Questionnaire

An Evaluation of the Effect of Physician Assistants (PAs) on Medical Student and Resident Education

1. I am currently on a service with a PA, or have rotated through a service with a PA during this academic year?

- Yes
- No

An Evaluation of the Effect of Physician Assistants (PAs) on Medical Student and Resident Education

2. I am currently

- Med 3
- Med 4
- PGY-1

3. How many rotations have you been on that employ a PA?

4. Which services have you rotated through that employ a PA? (ex. Neuro, Ortho, Plastics, etc.)

a:

b:

c:

5. While on rotation I interacted with a PA

- Daily
- Every 2-3 days
- Once a week
- Less than once a week
- Never

6. With the addition of PAs in your practice setting, you would suspect that patient/family satisfaction has:

Greatly Decreased	Decreased	Stayed the same	Increased	Greatly Increased
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Rate the clinical competence of the PAs in your practice area:

Very Incompetent	Somewhat Incompetent	Neutral	Somewhat Competent	Very Competent
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

8. The PAs have good clinical competency and are able to answer my questions about direct patient care:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. The PAs facilitate my ability to get prompt answers to patient care questions:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. When a patient's questions are answered by the PA, I feel the patient is

Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

11. PAs promote continuity of care:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. The PA role overlaps with my role:

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. If I can choose whether to page the Team Doctor or the Physician Assistant for a clinical question, I usually will first page the:

- Team Doctor
- Physician Assistant

14. How do PAs function as part of your department model? (select all that apply)

- Part of the team with residents
- Part of the team with fellows
- Independent procedures
- Supervised by trainees (residents or fellows)
- Present patients on teaching rounds
- Primarily have patients and/or rotate admissions with trainees

15. The PA saves time during rounds and evaluating new patients

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

16. The PA aides in communication with healthcare team and families

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

17. The PA aides in the quality initiatives

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. PAs are unable to answer my questions about direct patient care

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. The PA aides in the med student/resident training

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

20. The PA participates in didactic discussion during rounds/conferences

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

21. The PAs perform procedures traditionally done by fellow/resident/med students

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22. The PA is supervised by fellows/residents during procedures

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

23. The PAs directly contribute to the resident's clinical education (i.e. Clinical skills or clinical patient management)

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. The PAs decrease med student/resident overall workload

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

25. There is clear communication between the PAs and the med students/residents

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. There is adequate collaboration between PAs and the med students/residents

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. In general, the PA role is clearly defined within each surgical service

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. There is a clearly defined hierarchy with the PA within the surgical service

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29. PAs take learning opportunities away from medical students/residents

Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	I prefer not to comment
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

30. In general, at what level do you think PAs most closely function?

- Attending
- Chief Resident
- Senior Resident
- Junior Resident
- Med Student