

A cross-sectional survey of German PA employment and workforce entry

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ABSTRACT

Objective: The contribution of physician assistants (PAs) to the German healthcare workforce has increased significantly since their introduction in 2005. From five training programs, the number has increased to the current 18, with 560 PAs awarded the PA bachelor of science degree as of 2020. Despite the growth, researchers lack systemic and reliable empirical data that provide insight into the German PA educational and professional profile. The German University Association Physician Assistant (DHPA) undertook the first nationwide cross-sectional survey on PAs in Germany to understand the German PA movement. This survey aimed to describe German PAs' entry into the profession and PA educational and job satisfaction.

Methods: PA alumni of all universities affiliated with the DHPA and all subscribers of the Facebook online social media platform PA Blog were invited to complete an online questionnaire.

Results: Of the 282 PAs who completed the survey, 77% were female and under age 25 years. Almost all (94%) were

employed, predominantly as PAs (91%, 241 of 265), although some held other positions. Most worked full time (87%), with some citing child-care needs as reasons for part-time employment (n = 21). Few reported unemployment (1.4%, 4 of 282). Eighty-two percent said they would probably or very likely choose the same course of study again. Most employed participants found the inclusion of frequent rotations between didactic and clinical training in PA programs beneficial. However, a small number of participants (26.8%) agreed that German PA programs' didactic and clinical teaching objectives were well aligned.

Conclusions: German PAs have a high level of satisfaction with their profession and report low unemployment. Improvement in the alignment of didactic and clinical educational objectives to improve academic qualifications and satisfaction emerged as an area of research.

Keywords: physician assistants, employment, job satisfaction, medical education, cross-sectional study, Germany

Since their introduction in 2005, German physician assistants (PAs) have significantly increased their contribution to the German healthcare system.¹⁻³ By definition, PAs are academically prepared and highly skilled healthcare professionals who provide a broad range of medical services in different clinical settings. Under the supervision of a physician, PAs complement existing services and improve patient access to healthcare.^{4,5} Internationally, more than 100,000 PAs work in a wide variety of healthcare systems on four continents.^{6,7} Given the concerns about a shortage of physicians in Germany, PAs were

proposed to ensure high-quality care in a broad range of medical settings.⁸

In addition to a workforce increase, the number of German PA education programs has grown. The first PA programs started in 2005.⁹ As of 2021, there were 18 programs and more than 1,000 PAs working in Germany.¹ Historically, German PA programs used imprecisely defined German translations of the job title *physician assistant*, such as *Arzt-Assistenz* or *Medizinische Assistenz-Chirurgie* for their PA training programs. Yet, the job title has evolved, and the designation *PA* has been generally

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recognized along with other European versions. In 2017, the German Medical Association and the Federal Association of Statutory Health Insurance Physicians jointly defined a minimum standard for PA educational programs.¹⁰ Some German PA programs frequently rotate between didactic and clinical curricula throughout the educational program. Concerns existed that this curriculum structure might not always guarantee that didactic topics and clinical objectives aligned.

The German University Association Physician Assistant (Deutscher Hochschulverband Physician Assistant, DHPA e.V., www.hochschulverband-pa.de) is a voluntary association founded in 2018.¹¹ DHPA is the only national organization representing all German PA educational programs and works to ensure quality education through developing and distributing educational services and products. DHPA is specifically focused on supporting the emerging needs of PA programs, the PA profession, and the German healthcare system. In addition, DHPA provides information about the PA profession in Germany and advises politicians, governmental and nongovernmental organizations, and the public.¹¹ As of November 2021, DHPA had 22 members (active and prospective programs).

Almost all PAs employed in Germany are alumni of universities affiliated with DHPA. Based on data collected by DHPA, six DHPA-affiliated universities had awarded a PA bachelor's degree as of summer 2020 to a total of 560 students. The six universities were the University of Cooperative Education, Carl Remigius Medical School, Baden-Wuerttemberg Cooperative State University, Fliedner University of Applied Sciences, European University of Applied Sciences (successor to Mathias- and praxisHochschule University of Applied Sciences Rheine), and Steinbeis-Transfer-Institute Medicine and Allied Health.

Despite the profession's growth, systematically assessed empirical data are needed to provide insight into the German PA educational and professional profile as working situations, career paths, and job satisfaction are absent from the literature. To address questions about the emerging profile of PAs, DHPA initiated the first nationwide systematic cross-sectional survey. The aim was to provide an overview of PAs' professional and educational profiles in Germany and create a foundation for additional research on this healthcare profession.

METHODS

The survey questionnaire was developed in 2020 based on a consensus of DHPA experts and incorporated binary and multiple-choice questions, along with a 5-point Likert scale for qualitative questions. In February 2020, 40 faculty of DHPA-affiliated universities pretested the questionnaire. The resultant questionnaire contained 36 questions in four sections. The sections were: sociodemographic data, entry into the profession, job satisfaction, and satisfaction with PA education.

The survey was anonymized, and IP addresses, email addresses, or other unique personal identifiers were not collected. Instead, a unique code was assigned to each survey response that was not traceable by investigators. However, this approach could not exclude the possibility that a participant answered the survey more than once. Responses were checked for duplicates.

Study population To avoid a potential overlap between students still enrolled in school (bachelor thesis not yet defended or accepted) yet already employed, students graduating in the summer of 2020 were systematically excluded to ensure accurate statistical calculations and to exclude the introduction of potential bias. The survey was conducted directly through DHPA-affiliated universities that shared a link with their alumni. The anonymous survey link was disseminated from July 7 to September 20, 2020. Because Carl Remigius Medical School did not offer

German PAs are mainly employed in hospitals, often in surgical departments.

an alumni program at the time of the survey, the survey was opened to participants subscribing to the online social media platform PA Blog from September 7 to September 20, 2020. PA Blog is an online network for PAs with an extensive outreach that aims to share educational and professional information for German PAs. As of December 2021, PA Blog, in connection with PA Jobs, had about 1,500 followers.

Ethical considerations The study was designed and conducted using the Lime Survey online tool, meeting Emden/Leer University's ethics and privacy policy and the Declaration of Helsinki. Distribution of the survey link by the individual institutions was done in accordance with the local alumni guidelines and privacy policy. Informed consent of the participants was obtained at the beginning and the end of the survey. No funding was granted to the researchers, the individual institutions, DHPA, or PA Blog to conduct this survey.

Data handling The technical transfer of the survey was carried out by the Emden/Leer University of Applied Sciences. The anonymized data were then digitally transferred to Neu-Ulm University, Faculty of Health Management, and analyzed in collaboration with Ludwig Maximilian University's faculty of statistics. Descriptive analysis was performed using the R software package. Analysis and calculations were based on available data, and the imputation of missing data was not performed. The survey's *a priori* sample size calculation was based on the total number of 560 German PA graduates as of the summer of 2020 and a hypothetical proportion of 50% for an arbitrary

binary variable. This assumption maximized the required sample size and resulted in a conservative sample size estimation of 229 for a confidence interval of 95% and a 5% margin of error.

RESULTS

Five hundred twenty-five graduates received the link to the survey via email from alumni programs, and an estimated 409 PA Blog followers clicked open the link. The online survey registered 499 total responses. Incomplete responses were excluded, resulting in 282 complete responses available for final analysis (response rate, 50.4%). No duplicates were identified. Most incomplete responses were from participants who stopped the survey at the second question.

Table 1 shows the demographics of the study participants. Most PAs were younger than 35 years, female, or childless; 53% (149 of 282) met all three criteria. Many participants had completed training in a healthcare profession before graduation, and all except two had graduated from a DPHA-affiliated university.

Employment Of those employed, most (91%) worked as a PA, and others as surgical RNs or technical assistants. Other areas of employment included management, leadership, executive management, company field service, company paramedics, study nurse, and health insurance medical service. Most PAs worked full-time (87%), 12% part-time, and two were on parental leave or transitioning to another workplace. The main reasons for part-time employment were child care ($n = 21$), caring for relatives ($n = 1$), and pursuing a second degree ($n = 3$). The majority (88%) were in permanent positions, and 30 PAs (11%) held a management position.

Entry into profession Nearly two-thirds (59%) reported that they had received a job offer from a university-affiliated (teaching) hospital while still in school, and 38% ($n = 101$) accepted this offer. Overall, 88% (232 of 265) successfully found employment within 3 months after graduation. When asked how they found their current job, two-fifths (40%) found their job through unsolicited applications, job advertisements, or web-based networks (31%), and 57% through internships or part-time jobs during their studies. Some participants received help from friends, acquaintances, family, or students to obtain employment; 167 respondents mentioned difficulties in finding a job. Most frequently, the distance to the job ($n = 71$), the salary ($n = 70$), or the scope of work ($n = 51$) did not meet expectations.

Job satisfaction (including place of work and income) At the time of the survey, 190 (71%) of the employed participants were still working at their first job, 54 (20%) had changed jobs once, and only a small proportion had changed jobs repeatedly or had not provided any information. Many PAs (89%, 237 of 265) worked in hospitals, often in surgical specialties (61%); see **Figure 1** and **Table 2**.

TABLE 1. German PA demographics (N = 282)

	n	%
Sex		
Male	60	21
Female	218	77
Not specified	4	2
Migration background		
Yes	49	17
No	228	81
Not specified	5	2
Age (years)		
Under 25	42	15
25-29	98	35
30-34	74	26
35 and older	66	23
Not given	2	1
Has children		
Yes	73	26
No	203	72
Not specified	6	2
Age of youngest child (years) (n = 73)		
Under 6	41	56
6 to 13	12	16
Older than 13	19	26
Not given	1	1
Qualification as a healthcare professional before enrolling in PA education		
Yes	203	72
No	77	27
Not specified	2	1
Healthcare profession before enrolling in PA education (n = 203)		
RN	126	62
Medical assistant	33	16
Medical technician	27	13
Paramedic	12	6
Physiotherapist	5	2
Employed		
Yes	265	94
No	12	4
Not specified	5	2
Current field of work (n = 265)		
PA	241	91
Surgical technical assistant	8	3
Other/surgical RN	14	5
Not specified	2	1
Place of work (federal state) (n = 265)		
North Rhine-Westphalia	122	43
Baden-Württemberg	36	13
Lower Saxony	31	11
Rhineland-Palatinate	12	5
Bavaria	11	4
Hesse	10	4
Other	43	16
Number of jobs since graduation (n = 265)		
1	190	72
2	54	20
More than 2	7	3
Not specified	14	5

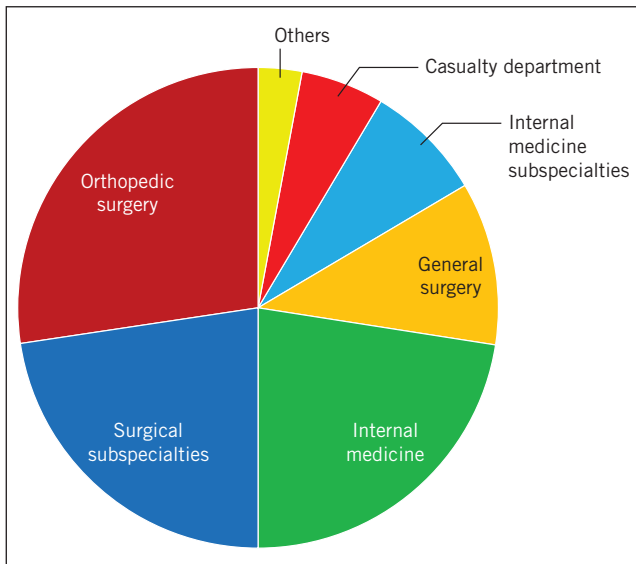


FIGURE 1. Practice specialties of PAs in Germany

Hospital surgical department	151
Hospital nonsurgical department	57
Hospital casualty department	29
Private practice	7
Practice association	4
Surgicenter	3
Other	12
Not specified	2

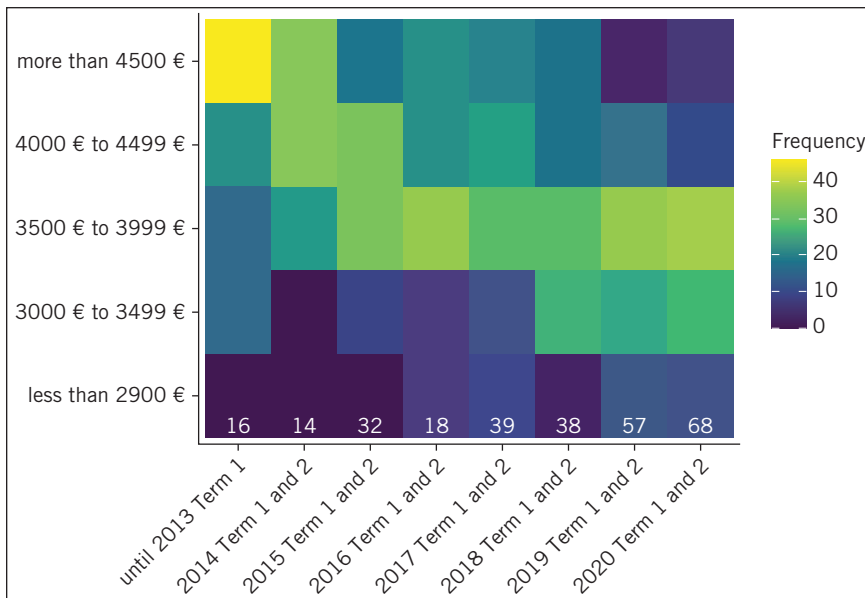


FIGURE 2. Monthly gross income distribution (in Euros) versus the year of graduation of PAs in Germany

Income and satisfaction with career choice The tile plot in Figure 2 displays the average monthly gross income, which was between €3,500 and €4,000. Income increased significantly with age and professional work experience (Kendall-Tau correlation coefficient +0.30; $P < .001$). In 23% of the PAs, gross monthly income was above €4,000.

Satisfaction with PA education The majority of participants who were employed ($n = 265$) felt that their professional position corresponded to their academic degree (53%, $n = 142$); 80 respondents thought that this was partially true (30%). Although 16 (6%) felt that their professional position did not correspond to their academic degree, 27 did not specify. Two-thirds (66%, $n = 176$) felt that their degree prepared them *well* (129) or *very well* (47) for their current position and 70 (26%) partially agreed. Six percent of respondents felt their education did *not well* ($n = 14$) or *not well at all* ($n = 3$) prepare them for their current work, and two participants did not specify. The majority (82%) would be *likely* or *very likely* to choose the same educational program again.

Most employed participants rated the frequent rotation between didactic and clinical training during education at least partially beneficial (87.5%, $n = 232$). The resultant workload of this rotation was rated as reasonable (68.7%, 182 of 265). However, only a quarter (28%, 79 of 282) strongly agreed ($n = 12$) or agreed ($n = 67$) with the statement that “didactic and clinical teaching was well aligned in terms of teaching objectives.”

DISCUSSION

The first cross-sectional study on PAs provides insight into their contribution to the German healthcare system. Most

German PAs are women, similar to the European Union, where 78% of all healthcare workers are women.¹² Most German PAs trained in a healthcare-related field before entering a PA program. German PAs are mainly employed in hospitals, often in surgical departments, and most feel that their professional qualifications meet the demands of their current position. However, 87 PAs regard their education as partially sufficient or insufficient. Whether personal aptitude, academic education, career choice, or mispositioning by the employer account for these deficits requires further investigation.

On the other hand, graduates successfully found a job they consider at the very least adequate. This is consistent with the many positions posted online, although job profile expectations and salaries may sometimes be

perceived as inadequate for acceptance. Given the level of training of a PA with a BSc degree, the development of a collective bargaining agreement (that is, unionization) is possible in Germany. Still, tensions in the collective bargaining structure between nursing and physician pay scales are foreseeable.

Reassuringly, most PAs would choose the same course of study again. Frequent rotation between didactic and clinical training was regarded as beneficial. However, frequent rotations during education pose an additional workload on students, and two-thirds of the graduates only rated this additional workload as reasonable. The data further suggest that the main challenge to following this curricular approach is the lack of alignment of didactic and clinical teaching objectives. Beyond clinical log-books and competence catalogs, more intensive mentoring during clinical education and bedside teaching aligned with didactic teaching may improve German PA education.

Adjustable curricular approaches are offered in Germany, such as the parallel (“dual”) education model, consisting of a fixed 2 to 3 days per week of didactic training and a fixed 2 to 3 days per week of clinical training. This is considered by some an easier curriculum method to organize. Furthermore, some German PA programs structure their curricula with an initial didactic/academic education period and then a final year of clinical rotations with intensive mentoring. Despite the differences, all the German PA programs meet the basic requirements jointly defined by the German Medical Association and the Federal Association of Statutory Health Insurance Physicians.¹⁰

Based on this undertaking, further research is needed to assess which educational approach is the most efficient and effective way to meet the growing needs of the German healthcare system. Therefore, the DHPA intends to establish a national PA certification board, similar to those seen in other countries such as the United States and the United Kingdom.

LIMITATIONS

The high response rate (282/560 graduates, 50.4%) suggests that this survey is representative of German PAs. According to the data provided by the DHPA-affiliated universities, 77.9% of all PA graduates were female, and 72% had completed a healthcare professional training program, such as nursing, before entering a PA program. These data were the only objective information provided by the universities for external validation of the results. The responses in the current research were virtually identical (77.3% female, 72% had passed a healthcare professional training), supporting the generalizability of the results. However, because the sample was not chosen randomly, a selection bias or a nonresponse error cannot be ruled out. Furthermore, the current survey underrepresented Carl Remigius Medical School graduates because of the lack of an alumni program—PA graduates from Carl

Remigius Medical School could not be surveyed, and only two responded via the PA Blog. Therefore, this research confirms the importance of carefully organized alumni programs to support the improvement of educational programs.

CONCLUSIONS

This survey of 560 German PAs found that most were female and work full-time in surgical hospital departments, consistent with their PA education and qualifications. Job satisfaction is very high, and most German PAs would choose the same training program. Unemployment is negligible. Yet, data suggest that the lack of alignment of didactic and clinical educational objectives results in lower satisfaction with PA education and requires further investigation. The next area of research is to assess German PA productivity and value as team members. **JAAPA**

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