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Abstract

Objectives: Despite the increasingly complex care and demanding health challenges shaping pharmacy, little work has been carried out to understand the global status of advanced and/or specialised pharmacy practice scopes and the models in which they exist. This study aims to describe the current global status of initiatives relating to advancement of pharmacy practice.

Methods: A global survey was conducted between January and May 2015 to collect country-level data from member organisations of the International Pharmaceutical Federation (FIP), national-level contacts from regulatory, professional and government agencies or universities; data requests were sent to 109 countries. The collected data were triangulated (comparing multiple sources from single countries, for example), cleaned and analysed by descriptive and comparative statistics.

Key findings: Full data sets from 48 countries and territories were obtained. The findings demonstrate varying systems of advanced pharmacy practice and specialisation often linked to income level. The study found that there are variations within terminology and definitions, frameworks for specialisation and advanced practice, professional recognition mechanisms and benefits across countries.

Conclusions: This survey of 48 countries and territories was the first of its kind to describe the range of specialisation and professional recognition systems for advanced pharmacy practice worldwide. Despite the variance, it is clear from this global study that professional advancement and the recognition of advancement in practice is developing around the world and this could be due to the increasingly complex nature of pharmaceutical care delivery and a consequent need to be able to endorse professional capabilities.

Key words

Advanced practice; specialisation; scope of practice; extended practice; professional development

Introduction

The global health workforce is the driving force of viable health systems, and the quality of human resources for health (HRH) is an indicator of healthcare service delivery levels and – ultimately – of population health outcomes.[1] Investing in health workers' competency and capability is crucial to achieving universal health coverage (UHC) and the United Nations (UN) Sustainable Development Goals (SDGs) by 2030.[2] Fully recognising this, intergovernmental organisations and agencies have developed a series of policy documents

and partnerships to drive global transformation of the health workforce. The UN High-Level Commission on Health Employment and Economic Growth, World Health Organisation's (WHO) Global Strategy on Human Resources for Health, and the 'Working for Health: Five-Year Action Plan for Health Employment and Inclusive Economic Growth (2017–2021)' all call for the unequivocal need to invest in the global health workforce.[3-5]

Health system changes are occurring at all levels and are influenced by growing and ageing populations, shifts in disease and epidemiological profiles in patients, and scientific advances in technology and medicines. Health professionals are therefore under heightened pressure to provide quality, integrated and often complex patient care that requires advanced and specialist knowledge and skills. One of the WHO Global Strategy's three key objectives sets out to "optimize performance, quality and impact of the health workforce through evidence informed policies on human resources for health".[3] The UN Commission calls for scaling up transformative lifelong learning such that health professionals meet population health needs and "can work to their full potential".[4] Achieving these objectives requires the re-configuration of health workers' potential contributions within collaborative practice environments by avoiding the under-utilization of their skills, and by ensuring that they practice within the full and extended scopes of their practice.

As experts in medicines, pharmacists play a key role in optimising safe and effective use of medicines- a prerequisite to achieving UHC and SDG 3: 'Ensure healthy lives and promote wellbeing for all at all ages'.[2] The past few decades have witnessed an expansion of pharmacists' roles from being primarily product-centred compounders to becoming competent and capable patient-centred practitioners who deliver expert services related to medicines and their use. In light of this and the growing evidence supporting pharmacists' direct effects on improved patient outcomes,[6] there is increasing movement towards professional recognition of more advanced performance, credentialing and quality assured specialisation of pharmacists. It is recognised that the abilities of advanced pharmacists to deliver patient care and make clinical decisions are at higher levels than those of entry-level pharmacists.[7, 8]

There is currently no global consensus on the definitions of advanced practice and specialisation; and the two terms are sometimes used interchangeably, which can create confusion.[9] It can be argued that specialisation describes 'scope of practice' denoting either a specific practice sector (such as community or hospital pharmacy); narrower fields of specialisation can also present within each practice sector (such as oncology or paediatric pharmacy). Specialisation can thus form a "horizontal" differentiation from other practitioners. Advancement, on the other hand, refers to 'level of performance' and could be explained as a "vertical" differentiation.[10, 11] Figure 1[1] illustrates these concepts and demonstrates broad and narrow

[1] Figure 1 legend and description:

Figure 1 Differentiation between advanced and specialist practice scopes.

This figure illustrates the broad and narrow focus of advanced generalism and specialisation, where specialisation can describe 'scope of practice' denoting either a specific practice sector (such as community or hospital pharmacy); narrower fields of specialisation can also present within each practice sector (such as oncology or paediatric pharmacy).

focus of advanced generalism and specialisation, respectively.

For the purposes of this paper, "Advanced practice" relates to a higher level of performance, and "Specialisation" relates to a narrow focus.

While the literature has examined the topic of extended practice roles of physicians,[12] nurses,[13-15] dentists,[16, 17] midwives[18] and other allied health professionals; little work has been carried out to understand the global status of advanced and/or specialised pharmacy practice scopes and the models in which they exist. This is surprising considering that pharmacists are, in many countries around the world, the public's most accessible source of health care services.[19] Developing practice scopes through advancing practice, often accompanied (but not always) with a focus and specialisation, will therefore potentially widen the public's access to optimised medicines-related healthcare services. Evidence-based information on the topic is scarce and where it exists is it not available in a standardised form that allows for cross-country comparisons. The current literature is mostly derived from more developed and primarily English-speaking countries such as Australia and the United Kingdom and with little reference to progress in other parts of the world. Expanding the evidence base on advanced practice and specialisation in pharmacy is therefore a global priority for developing a pharmaceutical workforce that delivers optimal medicines-related services and ultimately improve patient outcomes.

The International Pharmaceutical Federation (FIP) is the global leadership body that is dedicated to transforming the global pharmaceutical workforce. FIP Education (FIP*Ed*) is the body within FIP that coordinates activities related to transforming pharmacy and pharmaceutical sciences education. FIP*Ed*'s Education Development Team brings together experts to undertake projects and develop evidence-based resources, technical reports and tools to inform and support education development. The experts lead working groups (domains) focusing on priority areas; the advanced and specialised practice domain is dedicated to gathering baseline information in this field and sharing the knowledge to trigger dialogue and actions towards stronger policies on the advancement of practice (including elements of specialisation and professional recognition).

Two recent and significant developments in pharmacy education and workforce contribute to our understanding in this area. In 2015, FIP*Ed* published the Global Report on Advanced Practice and Specialisation in Pharmacy, which is the first publication of its kind to collect comprehensive global baseline data on this topic.[20] FIP Member Organisations were surveyed and forty-eight countries and territories responded with information regarding policy and implementation of advanced practice and specialisation. In addition, a series of seventeen country case studies were presented to illustrate an in-depth view of policy and implementation

Specialisation can thus form a "horizontal" differentiation from other practitioners. Advancement, on the other hand, refers to 'level of performance' and could be explained as a "vertical" differentiation.

trends. In 2016, FIP endorsed 13 Pharmaceutical Workforce Development Goals (PWDGs)[21] which set the milestones for future development of the global pharmaceutical workforce. The PWDGs include a goal for 'Advanced and specialist expert development' (PWDG 4) which describes the need for countries to have: "education and training infrastructures in place for the recognised advancement of the pharmaceutical workforce as a basis for enhancing patient care and health system deliverables." Advanced practice and specialisation has been an important focus for FIP*Ed* since the establishment of the domain, and a commitment to facilitate the global implementation of the PWDGs, including PWDG 4, make this a priority area of work.

This manuscript presents new findings and additional data together with a further extended analysis, building on the data collected for the 2015 FIP report [20]. It describes the results of a global quantitative survey with data collected from 48 countries and territories; it is the first study of its kind to describe the current global status of initiatives relating to advancement of pharmacy practice.

Methods

A survey tool asking for quantitative and multiple-choice responses to a series of prompts regarding advanced practice and specialisation was developed by FIP*Ed* and collaborating partners. The survey data collection tool was validated for construct and content by an expert working group, drawn from a cross-section of FIP sections and special-interest groups comprising academic consultants, professional leadership body representatives and elected FIP representatives; the expert working group provided informed feedback on the survey question construction, usage and understandability prior to release. The expert working group comprised 20 individuals, using a focus group format, at international locations in Australia, London, Prato, and Netherlands to review and validate the final survey tool syntax. The survey tool was made available in two languages (English and Spanish).

The survey was conducted between January and May 2015. FIP member organisations, national-level contacts from regulatory, professional and government agencies or universities, were approached for responses relating to their country level practice. Initial organisational contact was via email, with the survey tool, sometimes in addition to telephone, with two-weekly follow up; some agencies were unable to provide data (not known or not held on record) and some were unrepsonsive, most often attributed to language barriers. Country level demographic and economic data were also collected. Formal ethical approval was not required, however data collection approval was gained from the FIP (Executive and Board structures) and is on record. Professional Associations and agencies contacted were free to choose not to provide data. No data were subject to privacy restrictions. As several data-holding agencies were contacted for some countries, we conducted triangulation on any conflicting data in order to verify some single country-level data; triangulation was by direct contact with the data-providing agencies highlighting the identifed data discrepencies and seeking resolution. Data triangluation resolution was required in two cases for two variables. The dataset

was subsequently cleaned before being coded and entered into a database in preparation for analysis. The cleaned data were analysed by descriptive and comparative statistics using Statistical Package for the Social Sciences (SPSS). Frequency counts and valid percentages (taking into account missing data for some items) are reported.

Without universally agreed definitions of "advanced practice" and "specialisation" and the associated potential for multiple and varying interpretations of these terms, careful consideration was given to the survey's language and terminology. The survey used "specialisation" and "advanced practice" as primary labels and included a definition of contextual meaning of the two terms, providing context for both analysis of the data and for organisations to provide responses. Both labels relate to practice that is beyond initial education and training, and beyond what can be broadly considered as foundation practice or training (i.e. generally relating to practice beyond 3 years post-registration/licensing).

Results

Data from 48 countries and territories were obtained. Table 1 lists the number of countries and territories by World Health Organization (WHO) region. All six WHO regions are represented in the responses; the majority of the submissions originate from Europe (n=20), followed by Pan America and the Western Pacific (n=8 each). Least responses were received from South East Asia (n=2) and Africa (n=6). The number of submissions from Europe (almost half of all submissions) was overrepresented and Africa underrepresented compared to the global distribution of WHO member states.

The respondent countries were also grouped by income level using the current World Bank categorisation [22] showing higher proportions of responses from higher and upper middle-income countries.

Figure 2[2] shows that the sample of 48 countries and territories has an equitable distribution between high and low capacity countries (capacity measured as the number of pharmacist per 10,000 population). The sample mean capacity statistic for the 48 countries and territories represented is 8.4 pharmacists/10,000 population, which is larger than a global mean published by FIPEd in its 2012 Workforce report (a mean of 6.02 pharmacists/10,000 with a sample size of n = 109 countries) [23], attributable to a different sample size and a statistical effect of fewer lower-capacity countries respondents to this survey. Table 2 and Table 3 provide an overview of selected data on key questions and an overview of all cases, respectively.

Terminology and definitions

[2] Figure 2 legend and description

Figure 1: Pharmacist capacity standardised as per 10,000 population (n=48 countries who responded to this survey). Data derived from 2012 workforce report [23]

This figure illustrates pharmacist capacity for the 48 countries that responded to this survey. Capacity is meausured as the number of pharmacists per 10,000 population. The data show that the sample of 48 countries and territories has an equitable distribution between high and low capacity countries.).

Asked for data concerning agreed definitions (or scope of practice) for their contextual understanding of advanced practice and specialisation, twenty-three countries and territories (48%) indicated the presence of national-level agreement on a definition of "specialisation". Respondents were also asked to indicate the lead agency or organisation for this national-level definition; Table 4 shows that leadership or "ownership" of definitions for specialisation in this sample is somewhat equally shared between government or regulatory agencies and professional bodies.

In contrast, eleven respondents (23%) indicated there was an agreed definition or description of the terminology related to "advanced practice" at the country level. Nine countries and territories in this sample (19%), provided evidence of defined practice that covered "specialisation" and "advanced". Similar to the availability of having a country level defined acceptance of specialisation or advanced practice (48% see above), 25 countries in our sample (52%) report having one or the other being in place. When factoring with economic development level (using World Bank classification) we found that high income countries in this sample are more likely to have a national definition of advanced practice/specialisation than low or middle income countries (LMICs) (Exact, $p<0.01$). In addition, there is a tendency for definitions of "advanced practice" and "specialisation" to be concurrent within countries (kappa = 0.32, $p=0.01$).

Frameworks for Specialisation and Advanced Practice

Eighteen countries and territories (38%) stated that frameworks were available for practitioners to use for guidance to describe specialisation or advancement, while ten countries (21%) reported that frameworks are in the process of being developed. Within these 28 respondents, 10 countries and territories (38.5%) reported that they have either directly used or are adapting frameworks from other countries.

Professional recognition mechanisms & benefits

Twenty-three countries and territories (48% of sample) stated that professional recognition of specialisation and/or advanced practice roles are available in their countries. An award of "titles" was indicated as form of professional recognition and 20 countries indicated the use of a formal post-nominal for individuals that match this professional recognition. There is a tendency for professional recognition systems or access to professional recognition to be an opportunity available for high income countries compared with LMIC activity (Exact, $p=0.07$), although not reaching statistical significance in this sample.

The responsibilities for awarding professional recognition or use of a post-nominal to individual practitioners, in this sample, seems mainly to stem from professional leadership bodies, with 84% (16) of the respondents who indicated a form of professional recognition status.

Twenty-two countries and territories (46%) stated that there are tangible or visible benefits for having national professional recognition mechanisms. The categories of benefit stated by respondent organisations

include enhanced career pathways, enhanced remuneration (connected to enhanced career pathways), and individual esteem or prestige.

Prescribing as a specialisation

The respondents were also asked about the prevalence of prescribing rights by pharmacists in their respective countries or territories. The survey asked if there existed overt legal provision for pharmacists to independently prescribe medicines; the survey asked participants to not classify "over the counter" medicines dispensing as independent prescribing. Nine countries and territories (19%) indicated that legal prescribing rights did exist and these are: Canada, Ghana, Israel, Namibia, Saudi Arabia, South Africa, United Kingdom, USA and Zimbabwe.

Discussion

Since this initial survey was conducted, FIP have launched the PWDGs[21] which include a goal specific to Advanced practice and specialisation (PWDG 4). This survey of 48 countries and territories was the first of its kind to describe the range of specialisation and professional recognition systems for advanced practice worldwide. The findings demonstrate varying systems of advanced practice and specialisation often associated with country-level economics and income level, with LMICs currently lagging in relation to defining and recognising advanced and specialist practice for respective country level workforce. Despite this variance, it is also clear from this global study that interest in practice advancement, with associated professional recognition, is a developing trend worldwide.

The number of submissions from Europe region was over-represented and that Africa region countries were under-represented contrasted with the global distribution of WHO member states; the authors acknowledge the that responses, and data availability for pharmacy practice advancement and specialisation, may have been affected by language or cultural factors potentially limiting global coverage of the case studies.

However, the trends are clear and the increased global interest in advancement and professional recognition of pharmacy practice can be attributed to the increasingly complex nature of pharmaceutical care delivery, the development of enhanced person-facing roles and an increasing scope for clinical pharmacy, all of which carry correspondingly associated risks. The global changes in population and patient demographics also map onto greater complexity in service provision and would suggest a consequent need to be able to endorse enhanced professional capabilities. Professional recognition, or professional credentialing, is established in a few countries worldwide, but is clearly gaining more traction on the workforce agenda; however our data sample here suggests this to be an associated tendency for the higher income nations, an association that clearly needs to be addressed through policy or structural mechanisms.

Several nations have defined specialist areas, clinically often related to disease groupings (for example, specialist pharmacists in oncology, or diabetes) in addition to more pharmaceutical subject areas such as technical services or aseptic product preparation. The clinical-oriented pharmacy specialities have often followed medical models in nomenclature, but increasingly – and associated with the national-level demographics for an increasingly elderly and co-morbid population, transferring the pharmaceutical care needs of these patients to community and primary care based advanced practice pharmacists will be become essential. In this scenario, it is not advanced specialisation that is required (often based in acute care settings) but advanced general practice clinical pharmacy. This is where opportunity lies to develop a common set of globally valid advanced practice competencies for career development and healthcare need purposes.

Opportunities for transnational collaboration are evident. In terms of framework development, results show that there is a relatively high degree of collaboration in progress globally. More than a third of countries and territories reported to having frameworks in place or under development have said that they adopted and/or adapted or are using frameworks from other countries. There is scope here for further collaborative working practice between countries and leadership organisations, and an opportunity for transnational recognition of advanced practice. One recent controlled cross-over study[24] illustrated the transnational applicability of developmental training frameworks for advanced practice, suggesting the possibility of a core mapping tool for the development of a globally relevant developmental framework for advanced practice in pharmacy.

The data complexity arising from this study will result in further work from FIP to support countries around the world to advance and recognise the capabilities of their workforces. The data retrieved from the survey were complex and multilayered, depicting a variety of systems and interpretations of what constitutes advanced pharmacy practice and specialisation. In additon, country-level data such as this requires triangulation, often from multiple national sources, in order to assure validity, and this was an embedded element of the methodological process. This survey, the first of its kind, provided a broad overview of these global trends and highlights the need for multi- and transnational workforce development programmes in order to shape a competent, capable and flexible global pharmacy workforce.

Conclusion

The WHO 2030 strategy is clear that countries need to enhance capacity and structured practice of health professions in order to deliver quality health care and progress global health goals. This work is a first global description of advanced practice and specialisation systems for pharmacy. It is clear from the data that there are variations in how these systems are developed, defined and conducted. However, there is evidence of increasing traction with structuring advanced level practices due to increasing demand from health care

needs. There is a need to support this development for low and middle income countries so that a 'capabilty' gap does not emerge based on limitations arising from economic factors. Building the capacity of sustainable advanced practice and specialisation systems relies on a number of factors but stem from identified demand for structuring practice pathways, resulting in needs-based systems that deliver quality pharmacy-led primary and secondary care to patients and populations.

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Table 1: Respondent frequencies by WHO Region.

	Global sample responses	%	All WHO Member States	%
Africa	6	12.5	46	23.7
Eastern Mediterranean	4	8.3	22	11.3
Europe	20	41.7	53	27.3
Pan America	8	16.7	35	18.0
South-East Asia	2	4.2	11	5.7
Western Pacific	8	16.7	27	13.9
Total	48	100	194	100

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Table 2: Case aggregated data on key questions [a]

		Response % (N)	Analysis commentary	Country Case examples
Country level agreed definition of "specialization"	Yes	48% (23)	High income more likely to have a national definition than LMICs (Exact, p=0.04)	Republic of Korea; Japan; Iceland; Hungary; Portugal; Uruguay; Belgium; Ghana; UK; Switzerland; Israel; Macedonia (Rep. of); Netherlands; Turkey; Germany; Singapore; Saudi Arabia; Peru; Costa Rica; Finland; Slovenia; Romania; South Africa
Country level agreed definition of "advanced practice"	Yes	23% (11)	High income more likely to have a with national definition than LMICs (Exact, p=0.009);	Republic of Korea; Australia; Belgium; Ghana; UK; Switzerland; Israel; Germany; USA; Finland; Slovenia
Availability of framework to describe specialization (narrow scope) and/or advanced pharmacy practice (broad scope)	Yes	38% (18)	48% of High income countries indicate having a framework	Republic of Korea; Japan; Australia; Zimbabwe; Ghana; UK; Switzerland; New Zealand; Israel; Netherlands; Germany; USA; Peru; Costa Rica; Finland; Nigeria; Slovenia; South Africa
	No, but under development	21% (10)		Lebanon; Taiwan (Republic of China); Philippines; Portugal; Belgium; Malaysia; Turkey; Singapore; Saudi Arabia; Canada
Availability of professional recognition of specialization and/or advanced practice (eg. award of titles)	Yes	49% (23)	Tendency to be a 'High Income' country activity (Exact, p=0.07)	Republic of Korea; Japan; Denmark; Australia; Namibia; Portugal; Ghana; UK; Switzerland; New Zealand; Israel; Macedonia (Rep. of); Netherlands; Germany; Singapore; Saudi Arabia; USA; Peru Costa; Rica; Finland; Nigeria; Slovenia; South Africa
Prescribing rights for pharmacists (current/in development)	Yes	19% (9)	A minority of countries have pharmacist prescribing rights, with even dispersion across economic indicators	Zimbabwe; Namibia; Ghana; UK; New Zealand; Saudi Arabia; USA; Canada; South Africa

[a] *data as provided at the time of survey data collation*

Table 3: Case Summaries[b]

Sorted by cluster analysis

Country	Column A: Income level *(World bank classification)*	Column B: Country level agreed definition of "specialization"	Column C: Country level agreed definition of "advanced practice"	Column D: Availability of framework to describe specialization (narrow scope) and/or advanced pharmacy practice (broad scope)	Availability of professional recognition of specialization and/or advanced practice (eg. award of titles)
Cluster analysis: Group 1 countries based on columns A-D					
El Salvador	Low&LMIC	No	No	No	No
Uganda	Low&LMIC	No	No	No	No
Zimbabwe	Low&LMIC	No	No	Yes	No
Egypt	Low&LMIC	No	No	No	No
India	Low&LMIC	No	No	No	No
Nepal	Low&LMIC	No	No	No	No
Nigeria	Low&LMIC	No	No	Yes	Yes
Ghana	Low&LMIC	Yes	Yes	Yes	Yes
Philippines	Low&LMIC	No	No	No, but under development	No
Hungary	Upper Middle Income	Yes	No	No	No
Macedonia (Rep. of)	Upper Middle Income	Yes	No	No	Yes
Romania	Upper Middle Income	Yes	No	No	No
Grenada	Upper Middle Income	No	No	No	No
Belize	Upper Middle Income	No	No	No	No
Namibia	Upper Middle Income	No	No	No	Yes
Jordan	Upper Middle Income	No	No	No	No
Lebanon	Upper Middle Income	No	No	No, but under development	No
Taiwan (Republic of China)	Upper Middle Income	No	No	No, but under development	No
Malaysia	Upper Middle Income	No	No	No, but under development	-
Turkey	Upper Middle Income	Yes	No	No, but under development	No
Cluster analysis: Group 2 countries based on columns A-D					

Peru	Upper Middle Income	Yes	No	Yes	Yes
Costa Rica	Upper Middle Income	Yes	No	Yes	Yes
South Africa	Upper Middle Income	Yes	No	Yes	Yes
Malta	High Income	No	No	No	No
Ireland	High Income	No	No	No	No
Denmark	High Income	No	No	No	Yes
Italy	High Income	No	No	No	No
Norway	High Income	No	No	No	No
New Zealand	High Income	No	No	Yes	Yes
Canada	High Income	No	No	No, but under development	No
Sweden	High Income	No	No	No	No
Australia	High Income	No	Yes	Yes	Yes
USA	High Income	No	Yes	Yes	Yes
Japan	High Income	Yes	No	Yes	Yes
Iceland	High Income	Yes	No	No	No
Portugal	High Income	Yes	No	No, but under development	Yes
Uruguay	High Income	Yes	No	No	No
Netherlands	High Income	Yes	No	Yes	Yes
Singapore	High Income	Yes	No	No, but under development	Yes
Saudi Arabia	High Income	Yes	No	No, but under development	Yes
Republic of Korea	High Income	Yes	Yes	Yes	Yes
Belgium	High Income	Yes	Yes	No, but under development	No
United Kingdom	High Income	Yes	Yes	Yes	Yes
Switzerland	High Income	Yes	Yes	Yes	Yes
Israel	High Income	Yes	Yes	Yes	Yes
Germany	High Income	Yes	Yes	Yes	Yes
Finland	High Income	Yes	Yes	Yes	Yes
Slovenia	High Income	Yes	Yes	Yes	Yes

[b] *data as provided at the time of survey data collation*

Table 4: Lead agency for country level definition of “specialisation”.

	Count	%
Professionally led	8	34.8
Government or Ministry	7	30.4
Regulator/Licensing agency	4	17.4
Agency not stated	4	17.4
Total	23	100