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Knowledge, Attitude and Practices of Health Professionals in Albania Regarding Infection Prevention and Control in Healthcare Settings

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Abstract

Background: Infection Prevention and Control (IPC) in healthcare facilities constitutes an important public health issue, especially in light of the ongoing COVID-19 pandemic.

Aim: The aim of this study was to assess the level of knowledge, attitude and practices (KAP) of health professionals in Albania regarding IPC aspects in healthcare settings.

Study design: Before-and-after surveys (cross-sectional studies).

Methods: The surveys were carried out in March 2021 (before IPC training) and next in April 2021 (after IPC training) including a nationwide representative sample of 505 physicians and nurses (84 men and 421 women) working in primary health care centres and maternity services in Albania. A structured questionnaire developed by the World Health Organization was administered (in March 2021) and re-administered (in April 2021) online to all participants assessing the KAP level regarding the IPC approach employed at health facility level. Wilcoxon's signed rank test (for two related samples) was used to compare the median differences in the KAP level before and after the IPC training received by survey participants.

Results: The KAP level exhibited a significant increase after the training of health personnel compared with the KAP level before the IPC training course, including the following dimensions: the importance of the number of personnel at health facility level; fulfilment of the

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standard of one patient per bed; the importance of adequate spacing between patient beds; availability of water services at health facility; the importance of the number of toilets at health facility level; the importance of functional hand hygiene and sanitation facilities; the importance of power supply, the importance of materials for cleaning; the importance of personal protective equipment; and the importance of medical waste management, including adequate labelling (all $P<0.001$).

Conclusion: This study provides useful evidence on the KAP level of physicians and nurses in Albania regarding IPC aspects related to healthcare settings. This evidence helps in the identification of the remaining gaps and needs for further training and support of professionals in Albania at different levels of health care provision.

Keywords: Albania, before-and-after survey; epidemiology, healthcare related infections, infection prevention and control, knowledge, attitude, practices (KAP)

INTRODUCTION

After the collapse of the communist regime in 1990, Albania has undergone a substantial demographic change and epidemiologic transition (1,2). The official sources of information mainly consisting of the national Institute of Statistics (http://www.instat.gov.al/) report that the share of the older population (individuals aged 65 years and above) in Albania was 15% in January 2021 (3), a proportion which was only about 4% in 1990. This remarkable aging of the Albanian population is due to an increase in life expectancy, a significant decrease in fertility rate (1,4), as well as due to massive emigration especially of the younger population (1). As expected, this fast demographic change is reflected in a sharp increase in the share of non-communicable diseases (NCDs) (1,5). Hence, in 2018, the mortality rate (number of deaths per 100,000 people for all ages) from all NCDs combined was about 752 (793 in males vs. 711 in females). For the same year, the mortality rate from all injuries was about 28 deaths per 100,000 population (6). On the other hand, based on the information provided by the Institute for Health Metrics and Evaluation, the mortality rate from infectious diseases, maternal, neonatal and nutritional diseases in Albania in 2019 was estimated at 27 per 100,000 population. This infectious disease burden constitutes only 3% of the overall mortality, whereas in 1990 it accounted for more than 20% of the all-cause mortality in Albania (6). Nevertheless, there is no specific information neither from national sources nor from international sources about the healthcare-related mortality or burden of infectious diseases in Albania.

The World Health Organization (WHO) has recently developed a self-assessment monitoring tool about "Infection prevention and control health-care facility response for COVID-19" (7). The objective of this operational tool is to assess Infection Prevention and Control (IPC) capacities to respond to COVID-19, but also to other infections in health facilities at different levels of care such as primary, secondary, or tertiary level, including also long-term care institutions (7,8). Of note, the WHO tool has also benefited from other useful instruments suggested by the Centre for Disease Prevention and Control (CDC) in USA (9) and the European Centre for Disease Control and Prevention (ECDC) (10).

The instrument developed by WHO supports health facilities to identify, prioritize and address the gaps in IPC capacities, structures and resources in order to respond adequately to COVID-19 and other infectious diseases (7). Following the WHO guidelines and recent developments, this instrument was recently translated and adapted into the Albanian context. In March-April 2021, in line with the translation and adoption into the Albanian context of the WHO self-assessment instrument regarding IPC aspects at health facility level (11), many health professionals (both physicians and nurses) were trained on monitoring procedures that should be applied for ensuring an adequate implementation of safety measures related to IPC. The trainings

were carried out online with technical support from the University of Medicine in Tirana and technical and financial support from UNICEF, Office in Albania.

In this context, the objective of this study was to assess the level of knowledge, attitude and practices (KAP) regarding IPC aspects among health professionals working at different levels in Albania, before and after a specific training course on a wide array of IPC aspects. We hypothesized an increase in the KAP level after the IPC training among at least 80% of health professionals included in this study.

MATERIAL AND METHODS

Two cross-sectional studies were conducted in Albania during the period March-April 2021. The first survey was administered in March 2021 including a nationwide representative sample of health professionals in Albania who were subsequently trained online about different aspects regarding healthcare-related IPC. A second cross-sectional study was carried out in April 2021 in the same sample of health professionals following the IPC training course.

Of note, during the period March-April 2021, there were trained online 1593 health professionals (585 physicians and 1008 nurses) from all regions of Albania working in primary health care centres (n=1411, of whom 550 physicians and 861 nurses), or in maternity services (n=182, of whom 35 physicians and 147 nurses).

On the whole, there are 413 primary health centres in Albania in which provide services a number of 1538 family physicians, 287 specialized doctors, as well as 6864 nurses and laboratory technicians.

The surveys conducted during March-April 2021 included a representative sample of 505 health professionals (84 men and 421 women) working in primary health care centres (n=453, or 32% of the overall trained personnel), or maternity services (n=52, or 29% of the overall trained personnel) in different districts of Albania. The survey forms were sent twice (before and after the IPC training) to one-third of training participants (n=531). Of these, only 505 survey forms were completed and returned by study participants. Hence, the response rate was: 505/531=95%.

Data collection consisted of an adopted version of the Infection Prevention and Control Assessment Framework (IPCAF) developed by the WHO (11). The IPCAF consists of a structured questionnaire, which was administered online twice (through the platform JotForm: https://www.jotform.com/) to all study participants (before and after the IPC training).

Besides demographic characteristics (age, gender), job profile (position, working experience) and general characteristics of the health facilities (district, residence, type of facility), all participants were asked (before and after the IPC training) to rank in a scale ranging from 1 (little) to 10 (a lot) their opinions (indicating their KAP level) regarding the importance of different components related to an

effective IPC approach, including the following dimensions: the number of personnel at health facility level; fulfilment of the standard of one patient per bed; the importance of adequate spacing between patient beds; availability of water services at health facility; the importance of the number of toilets at health facility level; the importance of functional hand hygiene and sanitation facilities; the importance of power supply, the importance of materials for cleaning; the importance of personal protective equipment; the importance of medical waste management, including adequate labelling (11). A full version of the questionnaire administered to all study participants is presented in Appendix 1.

The survey was approved by the Scientific Committee of the national Institute of Public Health, Tirana, Albania.

Measures of central tendency (mean and median values) and dispersion (standard deviations and interquartile ranges) were calculated (before and after the IPC training) for the KAP dimensions, which were expressed as numerical terms (variables) in a scale from 1 to 10. On the other hand, frequency distributions (absolute numbers and their respective proportions) were reported for categorical variables including the availability of information materials at health facility level (Table 1), or monitoring procedures applied at health facility level for an adequate IPC approach (Table 2).

Wilcoxon's signed rank test (for two related samples) was used to compare the median differences in the KAP level before and after the IPC training received by survey participants.

A p-value of ≤ 0.05 was considered as statistically significant in all cases.

Statistical Package for Social Sciences (SPSS, version 22) was used for all the statistical analyses.

RESULTS

Mean age in the study sample was 40±11 years. About 83% of survey participants were women; around 70% worked in urban health care facilities; almost 90% worked in primary health care centres, whereas the rest worked in maternities (paediatric services); two-thirds were nurses, and one-third were physicians; mean working experience was about 15 years; almost one in four participants was the manager/director of the health facility (data not shown in the tables).

Table 1 presents the distribution of information materials available at health facilities according to survey participants. About 93% of survey participants reported availability of informational materials for an adequate hand hygiene; about 42% reported availability of informational materials about antibiotic-resistance; 72% about disinfection and sterilization; 83% about protection and safety of health personnel; about 74% reported availability of materials on proper waste management; and 64% about safe injections.

Table 1. Informational materials available at health facilities included in the survey

INFORMATIONAL MATERIALS	FREQUENCY	PERCENT
Hand hygiene	468	92.7
Antibiotic-resistance	213	42.2
Disinfection and sterilization	363	71.9
Protection and safety of health staff	417	82.6
Waste management	371	73.5
Safe injections	322	63.8
None	3	0.6
TOTAL	**505**	**100.0**

Conversely, the distribution of the monitoring procedures available at health facilities according to participants' reports was as follows (Table 2): about 58% reported hand hygiene procedures; 56% waste management procedures; 54% cleaning of rooms or other spaces at health facilities; 50% consumption of soap or alcohol solutions; 35% disinfection and sterilization of instruments, or procedures related to the change of wounds. Slightly more than half of participants (52%) reported the availability of all the aforementioned monitoring procedures, whereas further 4% of participants reported none of these procedures.

Table 2. Monitoring procedures available at health facilities included in the survey

PROCEDURE	FREQUENCY	PERCENT
Disinfection and sterilization of instruments	176	34.9
Hand hygiene	292	57.8
Consumption of soap or alcohol solution	253	50.1
Change of wounds	176	34.9
Cleaning of rooms/spaces	271	53.7
Waste management	284	56.2
All	264	52.3
None	19	3.8
TOTAL	**505**	**100.0**

Table 3 presents the distribution of KAP level before and after the IPC training received. The KAP level regarding all the items exhibited a significant increase after the training of health personnel compared with the knowledge level before the IPC training course (all p-values <0.001 according to Wilcoxon's signed rank test for comparison of two related samples). Hence, after the IPC training, participants had a better knowledge about the importance of the number of staff in the health facilities (mean scores before and after the training were respectively: 6.4±2.0 vs. 8.3±2.0, where higher scores indicating a higher level of knowledge). Similarly, after the IPC training, participants had a better knowledge about the importance of fulfilling the standard of one patient per bed in the health facilities (mean scores before and after the training were respectively: 5.4±2.0 vs. 8.3±2.4) [Table 3].

Furthermore, after the IPC training, health professionals had a better knowledge about the importance of adequate spacing between patient beds in the health facilities (mean scores before and after the training were respectively: 7.7±2.0 vs. 8.7±2.0). Also, after the IPC training, interviewees had a better knowledge about the importance of water services available at all times and of sufficient quantity in the health facilities (mean scores before and after the training were respectively: 6.5±1.0 vs. 9.2±1.2). Likewise, after the IPC training, participants had a better knowledge about the importance of the number of toilets in the health facilities (mean scores before and after the training were respectively: 5.9±1.8 vs. 8.8±2.0). In addition, after the IPC training, health staff had a better knowledge about the importance of hand hygiene stations available in the health facilities (mean scores before and after the training were respectively: 7.1±1.7 vs. 9.0±1.8) [Table 3].

Through the same lines, there was a significant improvement in the level of knowledge of the health personnel about the following additional dimensions: the importance of the energy/power supply (7.4±1.3 vs. 9.3±1.3, respectively); the importance of materials for cleaning (7.3±1.2 vs. 9.4±1.2, respectively); the importance of personal protective equipment (7.5±1.1 vs. 9.5±1.2, respectively); the importance of the number of waste collection containers (7.6±1.3 vs. 9.7±1.3, respectively); and the importance of correct labelling of waste containers in the health facilities (7.7±1.2 vs. 9.6±1.2, respectively) [Table 3].

Table 3. KAP level before and after the IPC training in a nationwide sample of health professionals in Albania in 2021 (N=505)

KAP QUESTION*	Before IPC training		After IPC training		P†
	Mean (SD)	Median (IQR)	Mean (SD)	Median (IQR)	
How important do you consider the **number of personnel** in your health facility?	6.4±2.0	7 (5-8)	8.3±2.0	9 (7-10)	<0.001
How important do you consider the standard of **one patient per bed** fulfilled in your facility?	5.4±2.0	7 (5-7)	8.3±2.4	9 (7-10)	<0.001
How important do you consider **adequate spacing** (of >1 meter) between patient beds in your facility?	7.7±2.0	9 (7-9)	8.7±2.0	10 (8-10)	<0.001
How important do you consider **water services** at all times and of sufficient quantity in your facility?	6.5±1.0	7 (7-8)	9.2±1.2	10 (8-10)	<0.001
How important do you consider the **number of toilets** at your health facility?	5.9±1.8	7 (5-7)	8.8±2.0	9(8-10)	<0.001
How important do you consider the functioning **hand hygiene stations** at your health facility?	7.1±1.7	8 (6-8)	9.0±1.8	10 (8-10)	<0.001
How important do you consider the **energy/power supply** at your health facility?	7.4±1.3	8 (7-8)	9.3±1.3	9 (8-10)	<0.001
How important do you consider the **materials for cleaning** at your health facility?	7.3±1.2	8 (7-9)	9.4±1.2	10 (9-10)	<0.001
How important do you consider the **personal protective equipment** at your health facility?	7.5±1.1	8 (7-8)	9.5±1.2	10 (9-10)	<0.001
How important do you consider the functional **waste collection containers** at your health facility?	7.6±1.3	8 (6-8)	9.7 ±1.3	10 (8-10)	<0.001
How important do you consider the waste collection containers **labelled** according to their content?	7.7±1.2	8 (7-8)	9.6±1.2	9 (9-10)	<0.001

* For all questions presented in the table, participants were asked to rank their opinions/perceptions in a scale ranging from 1 (little) to 10 (a lot).

†P-values for comparison of median differences by use of Wilcoxon's signed rank test (for two related samples). SD = standard deviation; IQR = interquartile range.

DISCUSSION

This KAP study (before-and-after survey) was carried out in a national sample of physicians and nurses in Albania working in primary health care services and maternity services. Main findings of this before-and-after survey consist of a significant increase in the KAP level in more than 80% of the health personnel trained about IPC issues. In particular, participants' KAP level indicated a considerable increase after the training in terms of the following IPC dimensions: the importance of the number of personnel at health facility level; fulfilment of the standard of one patient per bed; the importance of adequate spacing between patient beds; availability of water services at health facility; the importance of the number of toilets at health facility level; the importance of functional hand hygiene and sanitation facilities; the importance of power supply, the importance of materials for cleaning; the importance of personal protective equipment; and the importance of medical waste management, including adequate labelling.

These findings highlight the importance of the training courses on IPC in order to enable the Albanian health professionals for employing adequate and effective safety measures. Of note, as of 2018, there has been a new reform regarding the restructuring and reorganization of health care services in the Republic of Albania, following the territorial and administrative reform undertaken in 2015-16 (1,5). Thus, in the past few years, administrative and managerial tasks regarding provision of health services (public health, primary health care services, as well as hospital services) have been transferred to a new institution that is the "Operator of Health Care Services" (which has four regional branches, each of which covering several local health care units) (1,5).

The information generated from this study carried out in Albania regarding the KAP level of health professionals about IPC issues helps to identify and single out training deficits, knowledge gaps and thereby inform about the needs for future training. Based on the needs identified, priorities should be set and incorporated into future planning of health care institutions at different levels of care and in all regions of Albania.

Yet, this study may have several limitations. Firstly, generalization of the findings may be confined by the sample representativeness, notwithstanding the seemingly big and nationwide representative sample of health professionals included in this study. In addition, the issue of potential information biases cannot be excluded, regardless of the fact that the instrument of data collection consisted of a standardized international questionnaire developed by WHO (11). More importantly, associations observed in cross-sectional designs are not assumed to be causal.

CONCLUSIONS

Regardless of potential limitations, this study provides useful evidence on the KAP level of physicians and nurses in Albania regarding IPC aspects related to healthcare settings. This

evidence helps in the identification of the remaining gaps and needs for further training and support of professionals in Albania at different levels of health care provision.

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Conflicts of interest: None declared.

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Appendix 1. Questionnaire administered to health professionals

- Socio-demographic characteristics: gender; age.
- Position and job profile: position (physician vs. nurse); years of working experience; director/manager of health facility (yes vs. no).
- Characteristics of health facility: district and municipality; area (urban vs. rural areas); type (primary health care centre vs. maternity services).
- What informational materials are available at your facility for monitoring of infection control and prevention programs/measures? (circle all options that apply: materials on hand hygiene; antibiotic-resistance; disinfection and sterilization; protection and safety of health staff; waste management; safe injections; none).
- What monitoring procedures are actually available at your health facility? (circle all options that apply: disinfection and sterilization of medical instruments; hand hygiene; consumption of soap or alcohol solution; change of wounds; cleaning of rooms and other spaces; waste management; all; none).
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the number of personnel in your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the standard of one patient per bed fulfilled in your facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider adequate spacing (of >1 meter) between patient beds in your facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider water services at all times and of sufficient quantity in your facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the number of toilets at your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the functioning hand hygiene stations at your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the energy/power supply at your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the materials for cleaning at your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the personal protective equipment at your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the functional waste collection containers at your health facility?
- In a scale ranging from 1 (little) to 10 (a lot): How important do you consider the waste collection containers labelled according to their content?