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IMPLEMENTATION OF NEW TECHNOLOGIES IN HOSPITAL: AWARENESS OF THE MEDICAL SPECIALIST

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Abstract

Introduction. To identify the knowledge and opinion on the introduction of healthcare technologies of employees of the healthcare organization a survey was conducted between the doctors, department heads and directors of seven hospitals in Almaty. The questionnaire was used to cover their work experience in the implementation of medical technologies in their workplaces and knowledge in the field of technology assessment (HTA). The survey was followed by a structured two-stage interview with hospital managers and doctors to clarify the answers. Most of the survey participants were not aware of the process of introducing medical technologies in Kazakhstan or the basics of decision-making in the healthcare system. The participants spoke in favor of a clear process of technology implementation in their hospitals and made a useful choice regarding implementation options. The use of HTA to facilitate decision-making on new technologies has been supported, but further training of personnel is required. Difficulties were noticed in the use of HTA in hospitals in the form of a lack of funding and staff working hours. Almaty healthcare facilities face difficulties, such as managing the selection and implementation of new medical technologies. Healthcare professionals are generally aware of the evaluation of healthcare technologies, which would help them make decisions, but its implementation in everyday life requires further development consideration.

Aim: Assessment of awareness of medical specialists in the field of health technology assessment

Materials and methods: For the design of the study was used qualitative research includes mixed methods: survey and interview of stakeholders of the health organizations in Almaty. A total of 315 medical staff took part in the survey and 22 in interviews. The SPSS program was used for descriptive statistics of the received data.

Results: The survey was conducted before and after the COVID-19 pandemic. Before lockdown for several questions there were many nil responses from participants and after COVID-19 respondents were able to answer a lot of questions compared to the previous survey. Responses in the survey covered the interest of hospital staff in HTA, aspects of its application and the process of introducing new technologies to their organizations.

Conclusions: All managers and most physicians agreed that an implementation process for new technologies was necessary, given current government policies. There were differing views on outsourcing as an option for preparation of HTA reports and subsequent advice to the hospitals. A need for additional training and and accessibility of available information in the field of HTA was supported by the interviews with managers and physicians.

Keywords: *new technologies, hospitals, health technology assessment, management.*

Аннотация

ВНЕДРЕНИЕ НОВЫХ ТЕХНОЛОГИЙ В ОБЪЕКТАХ ЗДРАВООХРАНЕНИЯ: ОСВЕДОМЛЕННОСТЬ МЕДИЦИНСКОГО СПЕЦИАЛИСТА

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Актуальность. Для определения знаний и мнения сотрудников организации здравоохранения о внедрении технологий здравоохранения был проведен опрос врачей, заведующих отделениями и директоров семи больниц города Алматы. Анкета использовалась для того, чтобы охватить их опыт работы во внедрении медицинских технологий на рабочих местах и знания в области оценки технологий (ОТЗ). За опросом последовало структурированное двухэтапное интервью с руководителями и врачами больниц для уточнения ответов. Большинство участников опроса не были осведомлены о процессе внедрения медицинских технологий в Казахстане или об основах при принятии решений в систему здравоохранения. Участники высказались за четкий процесс внедрения технологий в своих больницах и сделали полезный выбор в отношении вариантов внедрения. Использование ОТЗ для содействия принятию решений по новым технологиям было поддержано, но требуется дальнейшее обучение персонала. Были замечены трудности в использовании ОТЗ в больницах в виде нехватки финансирования и рабочего времени персонала. Объекты здравоохранения Алматы сталкиваются с трудностями, такими как управление выбором и внедрением новых медицинских технологий. Сотрудники здравоохранения в целом осведомлены об оценке технологий здравоохранения, что помогло бы им принимать решения, но внедрение его в повседневную жизнь требует дальнейшего рассмотрения.

Цель. Оценка осведомленности медицинских сотрудников в области оценки технологий здравоохранения.

Материалы и методы. В качестве дизайна исследования применялось качественное исследование из смешанных методов социального опроса и интервьюирования заинтересованных сторон организаций здравоохранения в городе Алматы. В общей сложности 315 медицинских работников приняли участие в опросе и 22 - в интервью. Для анализа полученных данных использовалась описательная статистика в программе SPSS.

Результаты. Опрос проводился до и после пандемии COVID-19. До карантина на несколько вопросов от участников было много нулевых ответов, а после COVID-19 респонденты смогли ответить на множество вопросов по сравнению с предыдущим опросом. Ответы в ходе опроса касались интереса персонала больницы к ОТЗ, аспектов его применения и процесса внедрения новых технологий в их организациях.

Выводы. Все менеджеры и большинство врачей согласились с тем, что процесс внедрения новых технологий необходим, учитывая текущую политику правительства. Были высказаны различные мнения относительно аутсорсинга как варианта подготовки отчетов по ОТЗ и последующего консультирования больниц. Необходимость дополнительного обучения и доступности имеющейся информации в области ОТЗ была подтверждена интервью с менеджерами и врачами.

Ключевые слова: Новые технологии, поликлиники, оценка технологий здравоохранения, менеджмент.

Түйіндеме

АУРУХАНАЛАРДА ЖАҢА ТЕХНОЛОГИЯЛАРДЫ ЕНГІЗУ: МЕДИЦИНАЛЫҚ МАМАННЫҢ ХАБАРДАРЛЫҒЫ

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Өзектілігі. Денсаулық сақтау ұйымы қызметкерлерінің Денсаулық сақтау технологияларын енгізу туралы білімі мен пікірін анықтау үшін Алматы қаласының жеті ауруханасының дәрігерлерінен, бөлімше меңгерушілерінен және директорларымен сауалнама жүргізілді. Сауалнама олардың жұмыс орындарында медициналық технологияларды енгізу тәжірибесі мен денсаулық сақтау технологияларын бағалау (ДСТБ) туралы білімдерін қамту үшін пайдаланылды. Сауалнама жауаптарын нақтылау үшін аурухана басшыларымен және дәрігерлерімен екі сатылы сұхбатпен жалғастырылды. Сауалнамаға қатысушылардың көпшілігі Қазақстанда медициналық технологияларды

енгізу үрдісі мен денсаулық сақтау жүйесіндегі шешімдерді қабылдау негіздерін білмеді. Қатысушылар өз ауруханаларында технологияны енгізудің нақты үрдісін жақтап, енгізу нұсқаларына қатысты пайдалы таңдау жасады. Жаңа технологиялар бойынша шешім қабылдауға ықпал ету үшін ДСТБ-ны қолдануды жөн көрді, бірақ қызметкерлерді одан әрі оқыту қажеттігі анықталды. Қаржыландырудың жетіспеушілігі және қызметкерлердің жұмыс уақытының тығыздығы ауруханаларда ДСТБ-ны қолдану қиындығы байқалды. Алматы қаласының денсаулық сақтау нысандары жаңа медициналық технологияларды таңдау мен енгізуді басқару сияқты қиындықтарға тап. Денсаулық сақтау қызметкерлері жаңа технологияларды бағалауды және бұл оларға шешім қабылдауға көмектесетіндігін түсінеді, бірақ оны күнделікті өмірге енгізуге әрі қарай дамытудың қажеттілігі туындауда.

Мақсаты. Денсаулық сақтау технологияларын бағалау саласындағы медицина қызметкерлерінің хабардарлығын анықтау

Материалдар және әдістері. Зерттеу дизайны үшін Алматы қаласындағы денсаулық сақтау ұйымдарының мүдделі тараптарынан аралас сапалы зерттеу әдістері, яғни сауалнама және сұхбаттасу қолданылды. Сауалнамаға барлығы 315 медицина қызметкері және сұхбатқа 22 адам қатысты. Алынған деректерді талдау үшін SPSS бағдарламасында сипаттамалық статистика әдісі қолданылды.

Нәтижелер. Сауалнама COVID-19 пандемиясына дейін және одан кейін жүргізілді. Карантинге дейін қатысушылардың бірнеше сұрақтарына нөлдік жауаптары көп болды, ал COVID-19-дан кейін респонденттер алдыңғы сауалнамамен салыстырғанда көптеген сұрақтарға жауап бере алды. Сауалнамадағы жауаптар аурухана қызметкерлерінің ДСТБ-ға деген қызығушылығына, оны қолдану аспектілеріне және олардың ұйымдарына жаңа технологияларды енгізу үрдісіне қатысты болды.

Қорытындылар. Барлық менеджерлер мен дәрігерлердің көпшілігі Үкіметтің қазіргі саясатын ескере отырып, жаңа технологияларды енгізу үрдісі қажет екендігіне келісті. Аутсорсингке қатысты әртүрлі пікірлер ДСТБ есептерін дайындау және кейіннен ауруханаларға кеңес беру нұсқасы ретінде айтылды. Қосымша оқыту қажеттілігі және ДСТБ саласындағы қолда бар ақпараттың қолжетімділігі менеджерлермен және дәрігерлермен сұхбат арқылы расталды.

Түйінді сөздер: Жаңа технологиялар, емханалар, денсаулық сақтау технологияларын бағалау, менеджмент.

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Introduction

The transition in post-Soviet countries from centralized hospital management to organization-oriented care processes has created a need to build up managerial capacity [12]. Hospital managers face a number of issues based on the needs of patients and of the health professionals who care for them. In post-Soviet states, health reforms have been characterized by decentralization of responsibilities to regional or municipal levels [6, 18]. Devolution of financial responsibility was a feature of decentralization in some countries, where regions were expected to collect funds and determine local health budgets [17].

In Kazakhstan, provision was made for a phased transition from a budget model for the healthcare system to compulsory social health insurance under a State Healthcare Development Program (CSHI) [20]. Government policy is aimed to reduce unjustified hospitalization and strengthening primary care. The leaders of hospital sector are in a competitive environment where the efficiency of their organizations depends on the implementation of effective and efficient healthcare technologies [5]. They require information on the clinical effectiveness, budget impact, safety, organizational and strategic aspects of the technologies they consider for adoption [9, 22].

The health technology assessment (HTA) is systematic evaluation of the properties and effects of health technologies, is an approach primarily used for informing decision makers. Hospital-based HTA (HB-HTA) gives an opportunity to make informed managerial decisions about the viability of implementing and using a variety of health technologies in hospital practice [19]. Different countries implement HTA system last 30 years, the first organization in the world was created in Sweden [8] and in Asian country was South Korea [13], which oriented to drug policy than healthcare [2, 23]. A survey of hospital managers of Kazakhstan regarded technological factors (new products and technologies), as highly important. Variability of political forces and volatility of regulations and legal norms were also important considerations [11].

The development of a system for assessing healthcare technologies in Kazakhstan was launched in 2009 with the supporting of the World Bank as a part of the Kazakhstan health sector technology transfer and institutional reform project [21]. The HTA department was established at the Republican Center for Health Development (RCHD) within the Ministry of Health (MoH). And training courses in HTA were organized in 2010-2013, the first HTA reports in the

country were prepared and started development of tools for prioritizing assessment topics [10, 16].

Initially, preparation of HTA reports for hospitals in Kazakhstan was linked to a process in which the RCHD department wrote to hospitals each year seeking requests for assessment of technologies that required further evaluation. The HTA department would select technologies based on prioritization of the suggested topics and prepare reports on these. In 2019, the process was revised by the MoH to also permit initiation of HTA projects by other bodies including the CSMI (compulsory social and medical insurance) fund, medical organizations, and professional associations in the field of healthcare. The process is regulated through the Joint Commission for the Quality of Medical Services (JCQM), an advisory body to the MoH [7].

With the availability of assessment facilities in Kazakhstan it is of interest to see how implementation of new health technologies and the use of HTA are viewed by hospitals as they adapt to the changes in health care organization. What are the practicalities for both hospital management and health professionals? The aim of the study reported here was to identify the knowledge and opinions of employees in medical organizations on issues and processes related to HTA and their management practices. Information was sought from staff at hospitals in Almaty, the largest city in Kazakhstan. A questionnaire survey was followed by interviews with senior staff to clarify issues where there had been limited responses.

Materials and Methods

Data sources

We used a mixed-methods approach. Contact with hospital staff was organized through the Department for Quality Control and Safety of Goods and Services of Almaty city. The Department sent a letter to the heads of eleven hospitals in Almaty asking them to invite their managers and physicians to participate in the survey. Contact information was provided for those staff to obtain additional information on the survey and to indicate their interest in participating. Expressions of interest were received from staff at seven of the hospitals and their subsequent responses to the questionnaire survey formed the basis of the analysis.

In stage two of the project, structured interviews were held with managers and physicians from five of the hospitals, which had participated in the questionnaire survey. An experienced qualitative researcher interviewed these staff.

Questionnaire survey

A questionnaire in Russian and Kazakh languages was developed that covered the process of implementation of technologies in Kazakhstan hospitals, and general knowledge on HTA.

Participants were asked for their position, work experience, their most recent training, and their fluency in English. There were seven questions covering the process of introducing new technologies in Kazakhstan and steps in the implementation of technologies in hospitals. Two questions had yes/ no answers, and five had lists of statements where participants were asked to tick those that they considered applicable to their experience (Table 1).

Table 1.

Process of implementation of technologies in Kazakhstan hospitals.

Question topics	Answers	Before COVID-19		After COVID-19	
		N	%	N	%
Respondent was trained in the field of health technology assessment (HTA)	Yes	56	33,5	55	37,2
	No	111	66,5	93	62,8
The authority responsible for introducing new technologies in Kazakhstan	Any medical organization	10	6,0	14	9,5
	Ministry of Health Care	75	44,9	121	81,8
	Research institutes or centers	23	13,8	10	6,8
	JCQMS ^a	9	5,4	3	2
	No response	50	29,9	-	-
Possession of information about the process of introducing healthcare technologies in Kazakhstan	Yes	69	41,3	70	47,3
	No	98	58,7	78	52,7
Which individuals are involved in the preparation of information regarding the introduction of new technologies in organization?	Chief of hospital	10	6,0	19	12,8
	Physicians	6	3,6	17	11,5
	All (staff, employees)	14	8,4	67	45,2
	Head of department	3	1,8	20	13,5
	No response	134	80,2	25	16,9
The need for a polyclinic in a clear process of introducing new technologies	Yes	138	82,6	130	87,8
	No	4	2,4	5	3,4
	Do not know	25	15,0	13	8,8
Who approves the implementation of new technologies in the hospital?	Head of hospital / director	56	33,5	16	10,8
	Deputy Chief of hospital / Deputy Director	13	7,8	11	7,4
	Physicians	65	38,9	95	64,2
	Head of the relevant hospital unit	24	14,4	4	2,7
	Health care managers			4	2,7
	No response	9	5,4	18	12,2
Who participate in the preparation of the HTA report at the hospital? (*One or more answers)	Head of hospital / director	60	35,9	28	18,9
	Deputy Chief of hospital / Deputy Director	48	28,7	4	2,7
	Physicians	79	47,3	113	76,4
	Head of the unit of the hospital	73	43,7	3	2

^a Joint Commission for the Quality of Medical Services

On the second part of the survey covered issues related to HTA. Participants were asked whether they had received training in HTA, if they agreed with how it was defined, which aspects of a technology should be covered in HTA reports for their hospital, and the type of HTA report that would be suitable. The questionnaire was pilot tested with five managers and 10 physicians from three hospitals who found all items to be understandable and acceptable. During pilot testing was not identified inconsistency of the survey results, revealed the consistency of the questionnaire between the experts. Participants indicate that questions were clear and easy to understand, questions constructed logically covered all the problem areas with the process of the implementation of new technologies in hospital.

The survey was conducted before the COVID-19 pandemic from December 2019 to March 2020 and after the pandemic from February 2023 to March 2023 among those employees who responded to the invitation using the Google online platform. The questionnaire is filled out independently. Moreover, at the end, an item was presented in which participants could express their opinion on the topic under study.

Interviews with hospital staff

Interviews followed a structured guide, which covered matters on which full answers had not been obtained in the survey. We provide two steps of interviews in different period. First interview was in June 2020, and second in August –September 2021. In first interview we included hospitals' needs for implementation of new technologies and possibilities for changing existing practices to promote innovation. Interviewees were free to suggest and discuss further related issues. Second interview was aimed to study the influence of COVID 19 to implementation new technologies in hospital and is education process of medical staff lasted for uncertain time.

Due to lockdown, interviews were conducted online by mobile phone or zoom, depending on the preference of the interviewee. The duration of interviews was about 25-30 minutes. The interviews were recorded and transcripts were encoded line by line, with codes assigned to each meaningful segment of text. Two researchers independently conducted a comparative analysis of transcripts, and identified similarities and differences in the answers from participants. The questions and responses were grouped into four blocks related to training of staff in HTA, preparation of applications for assessment, important aspects of technologies for hospitals, and options for their implementation.

Results

Questionnaire survey

Before the COVID-19 there were 167 respondents in the questionnaire survey, 128 physicians (76.6%), 29 department heads (17.4%), and 10 deputy chiefs or directors of the hospitals (6.0%). Responses to questions on the process of implementing health technologies are shown in Table 1. For several questions there were many nil responses from participants. Only 56 (33.5%) respondents indicated they had been trained in HTA, though 140 (84%) participants were in hospitals where courses in HTA had been offered over the previous three years. Most interviewees responded on the authority responsible for introducing new health technologies to Kazakhstan. Correct

identification of the MoH was made by 75 (44.9%) participants and of the JCQM by nine (5.4%). All participants answered whether they knew of the process of introducing healthcare technologies to the country, with a minority of 69 (41.3%) stating 'yes'.

The other questions had a more specific focus on new technologies in hospitals. That on the basis for managers to make decisions on new technologies had an indicative response from only eight staff (5%). The query on responsibility for preparation of information on introduction of new technologies had responses from 33 (20%). All four options attracted some responses, giving no clear direction. There was strong support for the need of a clear process for introducing new technologies with 138 (83%) participants indicating 'yes'. On responsibility for suggesting implementation of healthcare technologies there were responses from 159 (95%). All four options were selected, possibly reflecting the realities of shared responsibilities in this area. For the multiple-choice question on who should be involved in actual implementation there were 260 responses with large numbers for each of the four options, again possibly reflecting a spread of responsibilities.

Responses regarding general knowledge on HTA are shown in Table 2. The first question asked if there was agreement with the definition of HTA given by the International Network of Agencies for Health Technology Assessment. These attracted responses from 154 (92%) participants with a large majority answering 'yes'. The next six questions asked whether assessment of certain aspects of health technologies should be included in an HTA report. The response rates were high with large majorities indicating that all these matters should be included in a report. The final question, on the type of HTA report that is suitable for a hospital, was answered by all participants. A full HTA report was selected by 110 (66%), with 34 (20.4%) opting for a rapid report and 23 (13.8%) for mini HTA.

After lockdown the survey was slightly improved and questions were included in the field of the impact of HTA in health care. There were 148 respondents in the questionnaire survey, 52 physicians (35.1%), 18 department heads (12.2%), 24 deputy chiefs or directors of the hospitals (16.2%), 33 public health managers (22.3%) and 21 nurses (14.2%). Responses to questions on the process of implementing health technologies are shown in Table 1. Respondents were able to answer a lot of questions compared to the previous survey. 55 (37.2%) respondents indicated they had been trained in HTA. Majority of respondents (141 (95.3%)) believe that the authority responsible for introducing new health technologies is MoH in conjunction with other organizations. Correct identification of the MoH with JCQM was made by 59 (39.9%) answers. In the survey of awareness of the process of introducing healthcare technologies to the country 90 (60.8%) respondents said 'yes' and 70 (47.3%) of them could introduce with the clear direction of the process of HTA.

About 55 (37.1%) respondents thought that all members of working group are responsible for involving in the preparation of information regarding the introduction of new technologies in organization. Although for initiating and participating of HTA from organization should be a physician by 95 (64.1%) members. There was strong support for the need of a clear process for introducing new technologies with 130 (87.8%) participants indicating 'yes'.

On responsibility for suggesting implementation of healthcare technologies there were responses from 127 (85.8%) and 15 (10.1%) responses were "don't know".

Responses regarding general knowledge on HTA are shown in Table 2. The first question asked if there was agreement with the definition of HTA given by the International Network of Agencies for Health Technology Assessment. These attracted responses from 127 (85.8%) participants with a large majority answering 'yes'. The next six questions asked whether assessment of certain aspects of health technologies should be included in an HTA report. The response rates were high with large majorities indicating that all these matters should be included in a report. At the section about type of HTA reports for a hospital, the answers were different, 54 (36.5%) are prefer full and mini-HTA reports, rapid and

mini-HTA by 8 (5.4%) participants. A full HTA report were selected by 35 (23.6%), 18 (12.2%) opting for a rapid report and 15 (10.1%) for mini HTA and 13 (8.8%) of them "don't know" about reports type. At the question about participation of conducting an external evaluation of the effectiveness of the use of medical technologies after the introduction in the hospital 20 (13.5%) responses said "yes", although most responses 85 (57.4%) did not take a part of assessment and 33 (22.3%) believed this process was not elaborated in the health policy. The 54 (36.5%) from all respondents know there is no assessment of quality of live, and by 75 (50.7%) were participated in the procedure of hearing HTA reports. High advantage when compared with other intervention were preferable answer for 63 (42.6%) and 55 (37.2%) responses had not identify the undesirable effects of introduced new technologies.

Table 2.

Opinions of hospital staff on HTA issues.

Question topics	Answers (agreement)			
	Before COVID-19		After COVID-19	
	N	%	N	%
INAHTA definition of HTA ^a	154	92	127	85,8
HTA report should include appraisal of the following:				
Safety	155	92.8	144	97,3
Clinical effectiveness	154	92.2	141	95,3
Cost-effectiveness	148	88.6	137	92,6
Ethical aspects	125	74.9	127	85,8
Legal aspects	133	79.6	116	78,4
Organizational aspects	136	81.4	121	81,8
What type of HTA report is suitable for the hospital				
Full HTA report	110	65,9	96	64,9
Rapid HTA Report	34	20,4	19	12,8
Mini HTA	23	13,8	16	10,8
Difficult to answer	-	-	17	11,5
^a HTA is the systematic evaluation of the properties and effects of a health technology, addressing the direct and intended effects of this technology, as well as its indirect and unintended consequences, and aimed mainly at informing decision making regarding health technologies. (http://www.inahta.org/)				

Interviews with hospital staff

In the first part of interview participated 8 managers and 14 physicians from the five hospital's. A summary of their responses is shown in Table 3. This presents the most prominent opinions that were given for each of the four blocks of questions, and the numbers of managers and physicians who provided responses. Managers and several physicians confirmed that some staff had received training in HTA but that there was a need for further instruction. Some managers considered implementation of HTA by physicians following training did not always occur.

Study participants confirmed their awareness of the RCHD letter regarding assessment of new technologies. For the hospitals in which they worked there had been insufficient time or expertise to prepare applications for assessment by the RCHD. Physicians had commitments to treating patients and knowledge they had regarding new technologies was gained from professional contacts. All participants agreed on the need for evidence on clinical effectiveness and economic viability of new technologies to be presented in HTA reports used by their hospitals.

There was some difference of opinion regarding the time scale of assessments and implementation of new technologies.

All managers favored a focus on short time scales, as they considered it was not possible to commit resources to longer-term projects. Most physicians felt that longer-term benefits should also be considered. There were also differences regarding appraisal of ethical and social aspects of health technologies. Managers expressed no interest in these areas while physicians noted the importance of ethical aspects.

All managers and most physicians agreed that an implementation process for new technologies was necessary, given current government policies. There were differing views on outsourcing as an option for preparation of HTA reports and subsequent advice to the hospitals. Some managers suggested reducing clinical workload so that physicians could meet technology assessment needs. Most physicians saw a need for managers to provide incentives for clinical staff to participate in assessment and implementation activities.

Use of external consultants was seen as an option, though most managers noted the need to monitor technologies after their introduction, which would best be done with hospital resources. Managers also mentioned the option of establishing a separate hospital department, though that might be costly.

In the second interview, we try to involve the same managers and physicians from the same hospital who attend.

Table 3. Opinions from hospital staff in interviews.

First step interview				
Block	Issue	Major opinions	managers (n=8)	physicians (n=14)
1. Training of staff in HTA	Small numbers of staff trained in HTA	Low interest by physicians in process of implementing technologies, preparing applications. Mainly interested in continuing education in practical skills	6	12
	If there is financial support to build the capacity of doctors	Opportunity to finance training; however, after training physicians must implement in practice, which does not always happen	5	Nr ^a
	If hospital specialists have been trained on HTA	Some had training on HTA issues. There is a need for additional training	8	7
2. Preparation of applications for assessment	If a letter was received from the RCHD on submitting applications for new technologies	Acquainted with the letter. But no applications. For their preparation, capacity needed on evidence-based medicine, data searches, knowledge of English, that hospitals do not have	5	12
	Hospital's interest in introducing new technologies	Hospitals do not always support implementation of new technologies because of cost	Nr	10
	Difficulties in preparing applications for introduction of new technologies	Physicians are interested in treating patients, learn of new technologies from conferences or colleagues.	5	12
3. Important aspects for hospitals in implementation of technologies	Required information on technology	Need to know the evidence about clinical effectiveness and the economics of technology issues	8	14
	Timing of implementation	Process of implementation and cost of technologies in a shorter time period is important, as hospitals cannot invest resources for long-term prospects.	8	Nr
		Physicians believe managers should consider long-term benefits of 5 years or more	Nr	10
	Ethical or social aspects of healthcare technologies	Managers were not interested in these topics. Physicians noted the importance of ethical aspects	8	10
4. Options for implementation of technologies	Solutions seen in the development of new technologies and the	Implementation of technologies is necessary, with introduction of compulsory health insurance and policy to reduce out of pocket payments. A separate department for HTA would be costly in the initial stages. A multidisciplinary working group may be preferable.	8	5
	Who should be involved in the preparation of the report and be responsible for implementation?	Potential to involve hospital staff; give additional work to physicians who know English at the expense of working time	8	Nr
	Options for attracting hospital staff to support HTA	Reduce the main work load in the department. Determine the time needed to work on reports of new technologies. Consider additional incentives due to the time spent by employees in preparation of reports	5	Nr
		Physicians were ready to study and use HTA. Main issue is how managers can find support for physicians involved in this work. Time and motivation are needed to prepare an HTA report	3	11
	Can this task be distributed by outsourcing or external companies?	External consultants could be an option. However, introduction of technology should be accompanied by further monitoring, which is best done with hospital resources	6	Nr
Second step interview				
Block	Issue	Major opinions	managers (n=5)	physicians (n=8)
Influence of COVID 19	Implementation of new technologies in hospital	Implementation of new technologies such as telemedicine or digital technologies was very important	5	8
	Education process of medical staff lasted for an uncertain time	Reallocation of resources has shown the importance of introducing HTA	5	
		Importance of scientific capacity, as well as collaboration and exchange of information regarding effective new technologies	5	8
		The need for training medical staff on HTA	5	8

Nr = no response

in first interview. We can enroll 5 managers and 8 physicians. Second interview was aimed to study the influence of COVID 19 to implementation new technologies in hospital and is education process of medical staff lasted for uncertain time. All interviewees noted that COVID-19 influenced a number of processes in the hospital. Three hospitals have been fully redeployed to admit patients with COVID-19. Four managers noted that the COVID-19 set a huge task, the importance and the need for the development of scientific potential among medical professionals. Moreover, all managers agree that the reallocation of resources has shown the importance of introducing HTA and the need for training medical staff, as it enables a faster exchange of information and the use of more effective treatment methods for patients with concomitant diseases. All participants noted that the introduction of new technologies was important, such as telemedicine or digital technologies that would help minimize contact with the patient, but at the same time fully provide treatment. This would help reduce the risk of infection for employees, which is very important when most physicians experience burnout and stress.

COVID-19 was a challenge for everyone, and often we medical staff could not understand what the course of the patient would be and how to predict the condition, especially with several diseases (two physicians). All eight physicians noted the importance of scientific capacity, as well as collaboration and exchange of information regarding effective new technologies.

Discussion. The study provided an outline of the experiences of hospital staff in the process of managing the selection and implementation of new health technologies. It gave an indication of the situation in Kazakhstan at a time of overall changes to the health care system due to government policies. Some aspects may vary for hospital services in other parts of the country and in other post-Soviet nations.

Adoption of HTA recommendations by decision makers depends on a conjunction of factors - institutional, organizational, professional - that is unique to the specific technology assessed [4]. Use of HB-HTA is linked to overall hospital management including future planning commitments. The surveys of staff identified challenges in putting in place a procurement and management process, supported by sufficient expertise, without undue impact on routine clinical duties or financial commitments. The application of HTA to assist the process was considered.

Responses in the survey covered the interest of hospital staff in HTA, aspects of its application and the process of introducing new technologies to their organizations. A need for additional training and accessibility of available information in the field of HTA was supported by the interviews with managers and physicians. Before lockdown most survey participants could not identify the processes for introduction of new health technologies into Kazakhstan and few knew the basis on which managers make decisions on their implementation. The interviews identified lack of expertise and limited interaction of managers with clinical staff as contributing factors. There was strong appreciation of the need for a clear process, and good responses on the responsibilities of hospital staff on implementation matters. Challenges and options for addressing these matters emerged from the interviews. And after lockdown there was clearly improved. The main part of medical staff is aware of the impact and importance of HTA in

the polyclinic. Although there is also a need to improve the knowledge and skills of employees in decision-making. Main part of respondents had common recommendations for improving the HTA system such as the allocation of additional funds for training to new technologies for specialists of private and local hospitals which participated in the CSML and receiving state orders for making independent analyses. Others suggested making the process open for discussion and technology evaluation by creating the model of implementation to improvement.

As a part of an overview of HB-HTA in different countries *Cicchetti et al.* [3] have summarized both various success factors and what has not worked in the experience of different organizations. Some of these seem relevant for the Almaty hospitals. Widely reported difficulties include lack of resources to maintain HB-HTA activities, absence of a widespread HTA culture, limited contextual information for assessment of hospital technologies and variability of internal HTA use. Success factors include training for HTA staff, transparency and rigor of the HTA process, top management commitment, clinicians' involvement, and a clear role and methodology for the HB-HTA unit. Most survey participants indicated that HTA reports should include all six indicated aspects of a technology for assessment. That response suggests a need for follow up with hospital staff to clarify practicalities in the framing and preparation of the reports. The aspects of a technology covered in a report will depend on the question that it addresses. Not all HTA reports are concerned with economic issues. Those who prepare the reports should be aware of ethical and legal aspects, and refer to these where necessary, but detailed evaluation of them will be less likely.

Responses in the interviews identified the difficulties in matching needed expertise in HTA with availability of funding and of physicians' time. Creation of a separate hospital department or use of external consultants were suggested. Experience with HB-HTA in other settings indicates that use of an HTA unit within a hospital can be successful in both influencing policy and administrative decisions and achieving overall cost savings [1, 24]. Overall savings to hospitals can be made through excluding implementation of inappropriate technologies and guiding the specification, timing and use of those that are adopted. Such options could be considered by the hospitals that participated in the study and by others within the Kazakhstan health system.

Conclusion. Because of changes to the healthcare system hospitals in Almaty face challenges in managing the selection and implementation of new health technologies in their organizations. Staff in the hospitals are aware of HTA, which would help their decisions, but support for its routine use requires further consideration.

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