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Chat-based telepharmacy in Denmark: design and early results

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Abstract

Objectives Following the introduction of a nationwide online telepharmacy chat-service in Denmark in the spring of 2012, offering free counselling to all Danish citizens, we aimed to investigate the types of enquiries that are made to the telepharmacy.

Methods We extracted 500 consecutive chat transcripts and categorised them in four categories: drug-related, symptom, technical and other. These categories were further divided into 28 prespecified subcategories. After the categorisation of the 500 transcripts, 7 new subcategories were added and the material was reanalysed. For drug-related enquiries, the drug in question was registered according to the anatomical-therapeutic-chemical system developed by World Health Organization. Veterinary and empty (nonresponding) enquiries were excluded.

Key findings Four hundred seventy-six eligible enquiries were identified and categorised. The enquiries were found to be diverse: 170 enquiries (35.7%) were drug-related, 124 (26.1%) were technical in nature, 91 (19.1%) were related to symptoms and 91 (19.1%) of the enquiries were categorised as other. The most common drug class was 'drugs related to the genitourinary system and sex hormones'. Only 50 (10.5%) of the enquiries happened in connection with an actual purchase at the online pharmacy. Of all enquiries, 28.6% led to a referral to a medical doctor. Of the customers, 89.2% were satisfied with the online counselling.

Conclusion The diverse enquiries require professional chat operators with broad experience. Some subjects are overrepresented when compared with regular pharmacy counselling and should receive special attention. Continued monitoring is considered essential.

Introduction

Access to pharmacy counselling on medicine is an important element of drug treatment, securing treatment concordance and patient empowerment. In this regard, community pharmacies contribute to the value of both prescribed and over-the-counter (OTC) medicine. However, pharmacy counselling is only readily available to patients who are able to collect their medicine at the pharmacy themselves. For patients who are not, they will have to rely on second-hand information from the person picking up the drug for them, contact the pharmacy by phone or obtain the information through other means.

Few studies have described telepharmacy solutions for counselling of customers at a distance from the pharmacy. A Danish literature review from 2011[1] showed that different models with both one-way and two-way communication had been tried out in different countries. While most studies focus on telepharmacy as a means to provide pharmacy services to areas and customers that do not otherwise have access to a pharmacist,[2–4] telepharmacy can also be used to provide a higher level of service with better and more easy access to a pharmacist.[5,6]

In Denmark, different methods for counselling of patients physically remote from the pharmacy have been tested by individual pharmacies. Until now, however, no standardised and nationwide service has been implemented. In spring 2012, a 24-h online counselling was introduced in Denmark.

The aim of this study was to analyse the type of enquiries made by customers receiving chat-based counselling. In this way, we tried to identify the needs of the customers and the specific requirements that are asked of the pharmacy when counselling distant customers.

Setting

Structure of the pharmacy

In Denmark, the pharmacy sector is privately operated but subject to strict state regulation. The proprietor pharmacist owns the pharmacy and is financially responsible. At the same time, the state (the Ministry of Health and the Danish Health and Medicines Authorities) controls and administers the sector through a licensing system, determining the number of pharmacies and their location. In Denmark, there are currently 314 pharmacies, in addition to 125 pharmacy outlets, 600 OTC outlets and 200 delivery facilities. The outlets and delivery facilities are a part of the distribution system but are not staffed with professional pharmacy personnel. A pharmacy covers on average 17 300 citizens and serves about 600 customers per day.

Danish telepharmacy: apoteket.dk

In collaboration with the Association of Danish Pharmacies, Danish community pharmacies provide access to medicines via the Internet (http://www.apoteket.dk). Medicine purchased at this website is delivered by post or picked up at the customers' local pharmacy. To ensure proper use of drugs purchased at the website, an online pharmaceutical counselling service was introduced in February 2012. Via a 'pop-up notification' on the website, all customers are advised to seek counselling by telephone, video or chat. This counselling is not only available when making a purchase but also directly from the front page of the website.

The online service is delivered by Copenhagen Sønderbro Pharmacy, on behalf of all community pharmacies in Denmark. The online counselling is operated by 16 pharmacists and 12 pharmaconomists (equivalent to a pharmacy technician but with a substantially longer education (3 years)), who are also working in the main pharmacy. The online service is operated 24-h, 7 days a week. The employees have received training in online counselling, written communication and pharmacotherapy.

The subject of each telephone and video call is documented by the operator, and all chat enquiries are fully documented by saving of all chat transcripts, although depersonalised. This provides an opportunity to ensure a high quality of service. In addition, it provides the pharmacy staff the opportunity to reflect upon their counselling.

The online service has been advertised in national television, magazines, newspapers, etc.

Method

Data from enquiries made via the chat were extracted in the period from 17 March 2012 onwards until 500 consecutive chat transcripts had been obtained. The transcripts were then manually classified. While the telepharmacy was introduced in February 2012, this period was chosen as a television commercial informing about the chat was running in the period from 27 February 2012 to 10 March 2012, which led to atypical enquiries from pharmacist students, journalists, health care professionals, etc.

Each enquiry was classified into one of four main categories: drug-related, symptom, technical and other. The enquiries were further classified into 28 prespecified subcategories. Chats containing enquiries about veterinary products and uncompleted chats, e.g. due to no response from either customer or operator, were excluded.

The classification was performed using an electronic form developed for this specific purpose. The formula was developed by AP, IH and LN using approximately 80 transcripts, which were obtained outside the primary study period. Furthermore, to minimise interobserver differences, a standard operation procedure (SOP) was prepared containing specifications on how to classify each type of enquiry.

There was often overlap in the enquiries regarding drugs and symptoms when, e.g. the costumer presented a symptom but also suggested a drug that might alleviate the symptom. Therefore, a general rule was applied: the enquiry was categorised as regarding the symptom if the operator recommended an action (e.g. 'seek medical help' or 'try a given drug') before the customer had suggested a drug or drug class. If, on the other hand, the customer suggested a drug or a drug class before the operator had made a recommendation, it was classified as a drug-related enquiry. A transcript was classified as multiple enquiries if the customer brought up several distinct topics.

For each enquiry, the following parameters were registered: country and geographic region of customer and date and time of day of the chat counsel. Furthermore, we classified enquiries whether they were made in connection with a purchase at the online pharmacy or not.

If any drugs were discussed, we registered the active pharmaceutical ingredient, including the anatomical-therapeutic-chemical (ATC) classification (a hierarchical classification system for drugs developed by the World Health Organization[7]) and the nature of drug (prescription, OTC, dietary supplements and vitamins or natural remedies). If the drug in question was available as OTC as well as on prescription, we registered the drug as OTC except when the chat transcript

clearly indicated that the drug had been obtained via prescription.

Finally, we noted if the operator referred the customer to a medical doctor, whether the customer was satisfied with the counselling (yes/no) and whether the customer stated that he or she would use the online service at another occasion (yes/no).

After classifying the 500 transcripts, a few additional categories were added to decrease the amount of enquiries in the category of 'other'. These subcategories were direct pharmacological question, psychological symptom, opening hours, practical usage of nonmedical products and mistaken enquiries. The latter was furthermore divided into customers that did not seek counselling, questions that should have been directed to the local pharmacy and customers trying to submit an online order via the chat. After the introduction of the new categories, bringing the total number of categories up to 35, all 500 chat transcripts were reassessed.

Transcripts were classified by HS, IH and LN using the SOP developed during the development of the method. Any doubts on how to classify a given enquiry was solved through consensus. All data analysis was performed by AP using STATA 12.0 (StatCorp, College Station, TX, USA). Approval from an ethics committee was not required.

Results

Five hundred chat transcripts were obtained in the period of 17 March 2012 to 25 April 2012, including 47 incomplete chats and 3 chats containing veterinary enquiries, which were subsequently excluded, leaving 476 eligible enquiries in 450 transcripts (median 11 enquiries per day) (see Figure 1).

One hundred seventy enquiries (35.7%) were drug related, 91 (19.1%) were related to symptoms, 124 (26.1%) were technical in nature and 91 (19.1%) of the enquiries were categorised as other. Further division of questions into subcategories is given in Table 1.

Among the drug-related enquiries, the vast majority belonged to either prescription (123; 56.2%) or OTC drugs (75; 34.2%). Only 17 (7.8%) and 4 (1.8%) of the enquiries were regarding dietary supplements and vitamins and natural remedies. When sorted by ATC classification, the most common drug class was 'drugs related to the genitourinary system and sex hormones' (ATC group G) for both prescription and OTC drugs. For prescription drugs, 'nervous system drugs' (ATC group N) and 'antiinfectives for systemic use' (ATC group J) were the next most often occurring classes, respectively, both when including and excluding enquiries regarding interactions. Concerning OTC drugs, the next most often occurring drugs were 'dermatologicals' (ATC group D) and 'nervous system drugs' (ATC group N) when excluding the enquiries regarding interactions. Further information is given in Table 2.

Only 50 (10.5%) of the enquiries occurred in connection with a purchase at the online pharmacy (disregarding 4 enquiries unrelated to the drug being purchased). Of the enquiries, 95.8% happened from within Denmark, with the remaining 4.2% coming from outside of Denmark. There was a roughly equal distribution among the Danish regions (data not shown). The number of enquiries peaked at 10 a.m., remaining at a near constant level until 8 p.m. where after it declined to a low level between 2 a.m. and 9 a.m. (data not shown in full).

One hundred thirty six (28.6%) of all enquiries led to the operator referring the customer to a medical doctor. Among the 91 symptom related enquiries, this figure was 50 (55.0%).

One hundred ninety-four (43.1%) of the customers answered the two optional questions about satisfaction at the end of the chat. Among these customers, 173 (89.2%) stated that they were satisfied with the advice given and 173 (89.2%) stated that they would use the chat another time. Among 26 customers that were not satisfied with the advice given or would not use the chat again, only 12 stated a reason. The most frequent reason was 'I did not feel I had received a sufficient answer' ($n = 5$).

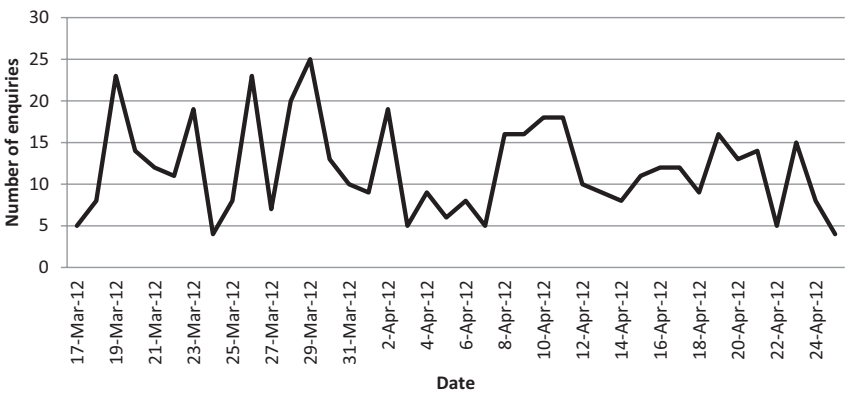

Figure 1 The number of enquiries per day in the study period.

Table 1 Distribution of enquiries among subcategories

Category (*n*/%)	Subcategory	Number of enquiries
Drug related	– Practical usage	41
n = 170	– Therapeutic choice (should I treat?)	26
35.7%	– Interactions	24
	– Side effects	18
	– Dosage	10
	– Questions regarding generic substitution	9
	– Storage, shelf life, disposal or expiration	7
	– Direct pharmacological question	7
	– Contraindications	7
	– Therapeutic choice (between drugs)	7
	– Duration of treatment	5
	– Formulation	5
	– Other	4
Symptom	– Dermal	30
n = 91	– Infectious	25
19.1%	– Pain	10
	– Other	8
	– Gastrointestinal	8
	– Psychological	4
	– Allergic	3
	– Respiratory	2
	– Cardiovascular	1
Technical	– Questions related to the home page	31
n = 124	– Prescription legislation	27
26.1%	– Reimbursement or price	21
	– Status of electronic prescription (prescription server)	20
	– Drug certificate (for bringing prescription drugs abroad)	14
	– Opening hours	11
Other	– Procurement of nonmedical product	35
n = 91	– Mistaken enquiry (did not seek information)	14
19.1%	– Mistaken enquiry (should have asked local pharmacy)	14
	– Other	13
	– Practical usage of nonmedical product	7
	– Mistaken enquiry (trying to submit online order)	6
	– Disease prevention	2

Discussion

The chat line was well utilised with an average of 11 enquiries per day. While most enquiries were drug related (35.7%), the enquiries were generally found to be highly diverse, encompassing both symptoms and more technical questions.

The analysis has several strengths. The inclusion of 500 chat transcripts allowed for a detailed analysis and subdivision of categories. Furthermore, the data-driven approach used by adding more categories after the analysis and reclassifying all enquiries allows for a more flexible and correct representation of the data material. The analysis also had some limitations. The data collection was started only one and a half month after the opening of the telepharmacy. Although the initial period was excluded, it is likely that the enquiries are not completely representative of the average user when the use of the telepharmacy becomes more established. However, as there is no visible trend in the number of enquiries during the study period (Figure 1), this is unlikely to be a source of major bias. Furthermore, the data collection period from March to April might lead to seasonal enquiries, e.g. a possible overrepresentation of OTC drugs related to the respiratory system (ATC group R).

The diverse nature of the enquiries, with an almost equal distribution of enquiries related to drugs, symptoms and technical issues, deserves special mention. Firstly, this emphasises the need for professional chat operators, such as pharmacists or pharmaconomists with broad theoretical and practical experience, to ensure that the questions asked by the customers can be answered sufficiently. Secondly, this also indicates that it is not a matter of the telepharmacy meeting a specific demand but rather several distinct demands by being the only available free direct online access to a health professional. The high prevalence of symptom-related enquiries might, for example, be caused by the online pharmacy being more easily accessible than the customer's own general practitioner, indicating a lack of easy access to a medical doctor.

The low prevalence of enquiries where the customer was actually buying the drug in question at the online pharmacy ($n = 50$, 11%) was a surprising finding. This emphasises the need for more general telepharmacy counselling as the customers, having already obtained their medicine elsewhere, sought out the telepharmacy for additional counselling and advice. Furthermore, this often entails that the customer has prepared specific questions in advance. This differs somewhat from ordinary pharmacy counselling where the pharmacist or pharmaconomist usually initiates the dialogue regarding use of medicine.[8]

In addition to the above, some subjects are overrepresented compared with ordinary pharmacy counselling and thus require special attention when operating the telepharmacy. Firstly, as much as 19% ($n = 91$) of the enquiries are related to symptoms, especially dermatological ($n = 30$, 6%) and infectious symptoms ($n = 25$, 5%). It is therefore necessary for the operators to know when and how to refer the customers to a medical doctor, as was done in 55% ($n = 50$) of the enquiries regarding symptoms. Secondly, 26% ($n = 124$) of all enquiries were technical, most commonly regarding specific questions to the home page ($n = 31$, 7%) and questions regarding prescription legislation ($n = 27$, 6%) (see Table 1). This emphasises the need for specific training for the operators of the telepharmacy regarding the home page. Furthermore, this also might indicate a need for more readily available informa-

Table 2 The distribution of drugs from drug-related enquiries into ATC classes for prescription drugs and over-the-counter drugs

Drug type	ATC	ATC text	Number of enquiries	Number of enquiries, excluding interactions
Prescription	G	Genitourinary system and sex hormones	35	30
n = 123	N	Nervous system	31	20
56.2%	J	Antiinfectives for systemic use	23	18
	C	Cardiovascular system	11	7
	D	Dermatologicals	5	5
	H	Systemic hormonal preparations	4	3
	S	Sensory organs	3	3
	R	Respiratory system	3	3
	B	Blood and blood forming organs	3	2
	M	Musculoskeletal system	3	2
	A	Alimentary tract and metabolism	2	1
Over the counter	G	Genitourinary system and sex hormones	16	16
n = 75	N	Nervous system	15	10
34.2%	A	Alimentary tract and metabolism	15	9
	D	Dermatologicals	13	11
	R	Respiratory system	12	8
	S	Sensory organs	2	2
	M	Musculoskeletal system	2	0

The remaining 9.6% enquiries were regarding dietary supplements and vitamins (*n* = 17/7.8%) and natural remedies (*n* = 4/1.8%).
ATC, anatomical-therapeutic-chemical.

tion for the customers regarding the legislation and reimbursement system. Lastly, the high prevalence of drug-related enquiries regarding drugs aimed at the genitourinary system and sex hormones (ATC group G), both as prescription drugs and OTC drugs, indicates that customer seek the telepharmacy for conditions that are thought of as embarrassing or very private, which should be considered when operating the telepharmacy.

The telepharmacy service has the potential to reach customers that would otherwise not have received adequate information, e.g. customers having their medicine delivered. It furthermore provides customers that have questions or experiences drug-related problems with easy and rapid access to pharmaceutical counselling. With increasing awareness of the online pharmacy in the population, the number of daily customers at the telepharmacy is expected to increase. To ensure correct counselling and optimal service, as well as to support the continued training of the chat operators, the continued monitoring of the number and type of enquiries and customer satisfaction is considered essential.

Conclusion

Few enquiries happen in connection to an actual online drug purchase, indicating a need for telepharmacy, which goes beyond what accompanies the online sale of drugs. Enquiries made to the online pharmacy are highly diverse and certain differences distinguish the enquiries that are made to the telepharmacy from regular pharmacy counselling. Continued monitoring of the telepharmacy is considered essential.

Declarations

Conflict of interest

The authors declare no conflicts of interest.

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Authors' contributions

All Authors comply to the ICMJE definition of authorship. All Authors participated in the planning of the study. IH, LN, HS and AP collected the data and AP performed all analyses. All Authors contributed to the preparation and revision of the manuscript. All Authors state that they had complete access to the study data that support the publication.

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