Literature review on medicine taking

For the study of perceptions on antibiotics and antibiotic use by patients, prescribers and pharmacists in a district hospital in Afghanistan.

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Introduction

In anthropology, Sjaak van der Geest has done seminal work on pharmaceuticals. One of his articles and those of other anthropologists focusing on the anthropology of pharmaceuticals will be presented in the beginning of this review. Though not focusing on antibiotics, these relevant articles inform about current and former concepts on medicine and medicine taking.

The second part of the review consists specifically of research on antibiotics, although it has to be mentioned that there is a greater amount of quantitative than qualitative literature on this topic.

The third part summarises the findings of a study that explores medicine use in PHCs and hospitals in Afghanistan.

In the end the reader will be informed about topics such as (over-)prescription, self-medication, antibiotic dispensing and the discourse on compliance, adherence, concordance and newer approaches to the research on medicines.

All in all, only little qualitative research has been done on antibiotic use from the perspective of the patient and even less on antibiotic use in Middle East countries.

<u>Anthropological theory on pharmaceutical usage</u>

This chapter focuses on anthropological theory of pharmaceutical usage from the perspective of different actors (doctors/pharmacists, patients). In the literature concepts such as compliance, adherence, concordance and newer approaches to the topic are discussed and should therefore be presented in the following. This chapter allows for a better understanding of the reasons behind overprescribing, self-medication and "non"-compliant patients.

Van der Geest et al. (1996) discuss the "life circle" of medicines, from production and marketing to distribution, prescription (or direct sale), use and efficacy. Thus, each phase takes place in a specific context with social actors. The most essential stages for this review are the prescription and intake phase, which is why it will be elaborated in more detail. Van der Geest et al. (1996) identify many different aspects influencing doctors' prescriptions. The authors raise five questions:

> "Who prescribes? What is being prescribed? Why do prescribers prescribe as they do or what does prescribing mean to them? What does the prescription mean to the client? And what are the consequences of overprescribing?" (1996:159)

Of significance is also who the prescriber is in the specific context. This might not only be a doctor, but nurses, health workers or pharmacists. Often unnecessary antibiotics, expensive or too many medicines are given, irrespective of who is prescribing. Faulty prescribing might not only be due to insufficient biomedical knowledge, but due to social and cultural factors. "What from a biomedical perspective appears irrational and objectionable may make good sense for social, cultural, or other reasons" (1996:159). Thus, doctors' decisions on prescriptions are only partly influenced by their biomedical knowledge.

Complying with patient expectations is one of the main reasons for "non-scientific" prescriptions (1996:160). Some patients report certain symptoms in order to obtain the desired medication. The treatment may serve as a proof and legitimation of the sick role, which entitles to "privileges and roles reserved for the sick "(1996:161).[1]

According to van der Geest et al. (1996) most studies on medicine intake focus on non-compliance from a "medico-centric perspective", in order to identify the reasons for "non-compliant" users and to improve their behaviour. However, these studies leave out the patient's perspective and thus their personal reasons for adjusting the doctor's instruction. The authors name the following example of Conrad (1985):

> "… epileptics may follow their own ideas of self-medication to test how long they can stay without medication, to gain more control over their situation, to escape the stigmatization associated with medication, or for practical reasons" (1996:166).

Interestingly, misunderstanding the practitioner is only in few cases the reason for being non-compliant. Most patients "deviate" due to their own interests, ideas and factors of their daily

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[1] Also Vuckovic and Nichter (1997) report on this phenomenon. Prescribing or not prescribing might serve as a „marker of illness severity" (1997:1296).

life. Patients have their own rationality. "That rationality includes not only medical considerations but also social, political, and economic ones" (1996:166).

The article also sheds light on how pharmaceuticals change their meaning from one context to another. From production by one actor in a specific context with a set of ideas the medicine travels to the users who might have other backgrounds and beliefs, which changes what the treatment was intended to be. One example of this "cultural reinterpretation" is the organisation of western medicines into "hot" and "cold", as described by Logan (1973), or the classification of medicines by their colours, which determines medicinal preferences (van der Geest et al. 1996). "Acceptance or rejection of a particular medication depended on this classification and not on biomedical knowledge" (van der Geest et al. 1996:166). Another important aspect in this regard is how patients perceive the illness. Etkin et al. (1990) found out that the Hausa think of an illness as a process. They use different medicines for different phases of the disease.

This ground-breaking work by van der Geest et al. (1996) is essential for the study on antibiotic use as it explains how meanings shift from one stage to another (production, marketing, distribution, prescription, intake) and from one actor to another (pharmaceutical company, pharmacist, doctor, patient etc.). A microbiologist in Europe may have other ideas and interests than an Afghan woman managing her daily life. It is thus not about non-compliant patients but about people controlling "the symptoms of their illness within the constraints of their daily routine of life" (van der Geest et al. 1996:166). The shift of context and the consideration of personal factors have to be taken into account when doing research on antibiotic use.

In a similar vein, Vuckovic and Nichter (1997) discuss medication use in the United States. Though this study is bound to its cultural context (the U.S.), there are many aspects important for any research on pharmaceuticals.

> "An individual's decision to use available pharmaceutical resources to alleviate discomfort, prevent illness, and enhance health is influenced by myriad factors. These factors range from cultural sensitivities and preferences for specific forms of medicine to economic considerations which influence medicine choice in the market place, from political issues which regulate medicine availability to marketing campaigns which create as well as respond to consumer demands" (1997:1285).

Similar to van der Geest et al. (1996), Vuckovic and Nichter (1997) mention the huge amount of literature on "non-compliance". Most of these studies focus on "what people do not know (or remember) rather than on what they think or have learned from experience" (1997:1286). The focus, as already mentioned above, is/was on how patients comply with doctors' directions and how to "correct" their behaviour. Alternatively, research could focus on how medicine intake impacts lifestyle (or how lifestyle has an impact on intake), "patients' concerns about protecting healthy body processes, perceptions of self-identity and social relations, and the desire to retain agency" (Vuckovic and Nichter 1997:1286).

An important topic the authors touch on is self-medication. Quantitative studies reveal that most people self-administer treatment without consulting a doctor. Saving time, avoiding costs of consulting a doctor and inconveniences are mentioned as factors that trigger self-care. However, the authors claim that there are little insights on when people self-manage an illness, for how long the symptoms persisted and which symptoms are self-treated (1997:1287). Buying over-the-counter (OTC) is a possibility when professional care is not available or affordable. For others time plays the important role, as waiting and being seen by a doctor is not compatible with household and job responsibilities (1997:1289). Others simply find visiting a doctor an inconvenience or do not have faith in the physician (1997:1294).

Self-care is also fostered by the increased availability of former prescription drugs now being available over-the-counter (OTC), and the possibility to buy drugs from unknown sources. The questions that might be asked here are: how do people decide on which medicine they buy? Are former advices of doctors decisive for which medicine to choose? Is there confidence in one special medication? How do people decide on which medicines to use for curing for example bacterial or viral infections? Are people aware of drug resistance and if yes does that affect self-medication? (1997:1288)

Self-care might have the advantage that the visit to the doctor becomes unnecessary, however, in terms of more severe illnesses it might delay health seeking and have serious consequences (1997:1295).

Important contributors within the self-help phenomena are pharmacists and the family network. Pharmacists give advices and influence patients' decision. Constant consultation with the pharmacist leads to delays in visiting the doctor or might even substitute the physician. Also the family is an important referral point as they share medication or provide "knowledge gained through experience" (1997:1296).

Vuckovic and Nichter (1997) also discuss the use of "alternative therapies". On the basis of a research by Murray and Shepherd (1993) they point out that "alternative" therapies should be called "additive therapies". This is because most people use alternative therapies additionally to allopathic medicine in order to enhance the chances of betterment or to counter adverse reactions. Here, it would be interesting to inquire if patients communicate additive therapies to the doctors and if such supplements lead to contrary action.

In summary, Vuckovic and Nichter (1997) claim for more research on self-medication, taking into consideration the rationality and practical logic of the patient.

Another essential article is a meta-ethnography by Pound and Britten et al. (2005). In their work they bring together qualitative research on medicine taking done between 1992 and 2001. This research is crucial as it gives an overview on the concepts and findings from the most relevant work on medicine taking (see annex). The article mainly concerns chronic illnesses, where the intake and impact of medicine is more influential than in acute diseases. However, findings and concepts serve as inspirations for research on medicine intake in acute diseases.

Through the synthesis of qualitative studies on medicine taking the authors critically analyse the focus of most former studies on compliance, adherence and concordance. While compliance implicates an unequal power relationship between doctor and patient (as the patient has to comply with the physicians' instructions), adherence is a more neutral term,

however with similar connotations. Concordance implies coming to terms through mutual agreement and equal power distribution between doctors and patients. The emergence of this concept was fundamental as several studies found that people modify their treatments according to their needs, lifestyle and well-being. The article names many examples from research on medicine intake and HIV, e.g. people who "take a break" from their treatment, people who "test out" how they feel when they leave out pills or infected women who skip medicines because they have to care for their family. These factors need to be accepted (and supported) by the doctor.

> "(The aim is) to involve patients in making decisions about their medicines,
> to ensure that they have enough information for doing this, and to support
> them with any problems they might have. Thus doctors might help patients
> with their testing and their modifications, providing feedback and guidance"
> (Pound and Britten et al. 2005:150).

However, this implies that patients speak honestly about how they modify the treatment and that doctors also clarify the downside of the medicines (which both often do not do). In the end "the power imbalance inherent in the doctor-patient relationship will not easily be resolved by concordance" (Pound and Britten et al. 2005:150).

In their discussion, the authors conclude that the major reason for patients not following medical instructions is the worry about the medication itself.

> "On the whole, the findings suggest that there is considerable reluctance to
> take medicine and a preference to minimise medicine intake" (Pound and
> Britten et al. 2005:151).

The authors therefore claim for a shift of focus (in research) from the patient to the medicine because otherwise the patient will always be blamed for "wrong behaviour" instead of calling into question the appropriateness of the treatment.

> "... Peoples' accounts are not taken at face value, the more mundane issues
> about the physical reality of medicines and the effects they have on peoples'
> bodies and minds are obscured and patients' priorities and concerns are
> neglected" (Pound and Britten et al. 2005:151).

Because most "non-compliant" patients try to minimise their treatment intake (omission of doses or therapy discontinuation) they argue for a new concept "reluctance". For the authors the reduction of drug intake is an expression of resistance against the prescription. Therefore, they claim that "the policy emphasis needs to be less on attempting to modify peoples' behaviour and more on developing safer medicines" (Pound and Britten et al. 2005:153). Doctors should give proper information on the positive and negative effects of the medicines (e.g. adverse reactions), as well as more support, feedback and safer prescriptions (2005:153).

Also Heath (2003) argues against the usage of the term concordance. She proposes that doctors need to understand that it is the patient who in the end decides on taking the drug or not. Doctors should inform patients about how to improve their health; however they should not coerce people. According to her, concordance is the wrong term as it exaggerates the

possibility that medical science and individuals with their daily struggles could come to terms. She claims for a term that accounts for divergence as a genuine consideration of patient needs would always lead to a conflict with the medical advice (2003). Furthermore, she criticises that medical science applies general rules to particular patients, although individual bodies can react differently to the same medication.

> "Patients need different information, not more of the same, and there is an urgent need for more honesty about the limitations of medicine and the uncertainties of medical knowledge. Patients need to be aware of the possibility of both benefits and harms and helped to make decisions based on their own valuation of the various possible outcomes" (2003:857).

Thus, patients should be helped to modify their treatments according to their needs, beliefs and values. In addition, it should be reflected that patients shift or adjust their views on medicines according to the gravity of the health condition. Heath (2003) refers to a study by Bashir et al. (2001) who found that 8% of Muslim patients surveyed would accept a medicine composed of "forbidden" ingredients (e.g. alcohol) in case of a minor disease, whereas 36% would find it acceptable in serious conditions.

<u>Literature on antibiotic use</u>

One of the most explored topics in studies on antibiotics is doctors' prescriptions. Less explored are antibiotic dispensing (by pharmacists, unqualified doctors or unknown sources) and antibiotic use by patients, especially in qualitative research.

Factors influencing antibiotic misuse
Hulscher et al. (2010) identify factors on four levels that influence the intake of antibiotics.

The first level constitutes patient knowledge and behaviour. Factors that come along with patients' antibiotic misuse are unawareness about the difference between viral and bacterial infections, not being informed about the problem of resistance, perceptions and beliefs about effectiveness of antibiotics and expectations of being given a prescription (2010:352). For example, according to a Dutch study there was a 66% probability that patients with bronchial infections who expected to receive an antibiotic received one. The probability to receive a prescription was only 34% in those who did not have such an expectation (Hulscher et al. 2010, Welschen 2004). The authors also describe the symbolic dimension of a prescription. "It means that the doctor has made a diagnosis, that treatment is possible, and that the patient can assume the role dictated by the illness" (Hulscher et al. 2010:353).

The second level is the influence of the doctor on antibiotic misuse. Overprescribing of antibiotics has to do with doctor's lack of knowledge, uncertainty about the correct diagnosis, fears (complications, disciplinary cases) and the wish to fulfil patients' expectations. Many physicians face difficulties in discerning bacterial from viral infections. Due to fears of complications they often prefer to take the "safe route" and give antibiotics. In a study done by MacFarlane et al. (1997) doctors indicated that most patients with bronchial infections did not need an antibiotic but non-clinical determinants (gender, economic status) were decisive for giving one.
A very important factor in terms of the second level is again the expectation of patients to receive an antibiotic. Those who expected an antibiotic would be prescribed one more readily.

The third level is the organisation of care. In hospitals the intake of antibiotics is often a longer-term process that involves different actors – doctors, nurses, pharmacists, microbiologists etc. A lack of coordination and communication between these actors can lead to problems in the use of antibiotics. The proposed solution is a deeper involvement of pharmacists and microbiologists who should give permission, advice and information on antimicrobials.

The forth level is the cultural and socio-economic context. This includes the influence of pharmaceutical companies on prescriptions of medicines (e.g. increase of broad-spectrum antibiotics through aggressive marketing), self-prescriptions and the availability of antibiotics without prescriptions in some countries. Also, how people perceive the cause of the illness (e.g. external or internal causes) and how it should be treated plays a role in the usage of antibiotics. The authors give the example of a study conducted in the Netherlands and Belgium. In the Netherlands people with a bronchial infection would treat the infection like a cold, which means they would self-manage (and not take any medication). In Belgium, people would consult the doctor.

Hulscher et al. (2010) propose to establish programmes to improve antibiotic usage on all levels. They suggest among others to circulate information through the media, educate physicians on antibiotics and train them in handling patients' expectations and pressure, implement computerised prescribing and encourage communication between pharmacists and doctors (Hulscher et al. 2010:355).

Doctors' reasons for (over-)prescribing antibiotics
Kumar et al. 2003 explore the processes underlying practitioners' decisions to prescribe antibiotics for sore throat on the basis of a grounded theory approach.

In this research doctors agreed that most cases of sore throat are viral infections and do not require an antibiotic. However, diagnostic uncertainty or fear of complications was often named as a reason to prescribe one. Also the social context played a role. When patients lived in "poor conditions" (poor housing, poor diet) they were considered as having a weak immune system and thus being more susceptible to bacterial infections.

Doctors named external pressure – e.g. research findings, discussions on resistance – as a reason to give fewer antibiotics. However, prescribing or not prescribing antibiotics has an impact on patients' expectations and consulting behaviour. Often doctors stated that it was difficult not to prescribe as patients had their ideas of receiving an antibiotic already fixed in their mind. Giving an antimicrobial in the end is less time consuming than explaining the reasons for not prescribing one. One doctor described this matter in the following way: "People aren't always as research would have them" (2003:3). This statement illustrates the struggles physicians face on a daily basis. On the one hand there is the external pressure to prescribe less antibiotics and on the other hand there are the everyday encounters with the patients, which bring about short term responses.

One doctor mentioned the holistic duty of a doctor. He acknowledges that patients have their beliefs, which often do not coincide with scientific findings. He stated:

> "(…) I mean, I find it hard to explain … how to communicate the science
> doesn't support what they believe. So for sore throat I have to think is it the
> bacteria, the virus, or patient you are giving the antibiotic for. So if I think
> I'm treating the whole patient and not just the virus then I feel better about
> giving the antibiotic here – because there is a holistic duty here" (2003:4).

His belief in the holistic duty allows him to overcome the difficulties he faces when patients' demands do not coincide with the doctor's advice.[2]

Study on antibiotic use in low-income countries
The literature review by Radyowijati and Haak (2003) explores the reasons for inappropriate antibiotic usage among practitioners, dispensers and patients in low-income countries. They analyse 37 studies from four different regions (Asia, Africa, Latin America and the Middle East). Their findings are divided into the topics "determinants of antibiotic prescribing",

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[2] Vuckovic and Nichter (1997) mention that advertising encourages the patients to ask for specific medication. If doctors do not comply with patients' demands they consult other doctors who would prescribe the drug. The authors also state that the patient request was the most frequent reason for "non-scientific" prescriptions (1997:1293).

"determinants of antibiotic dispensing" and "determinants of community antibiotic use" (2003:733).

Radyowijati and Haak (2003) identify several reasons for inappropriate antibiotic prescribing among doctors, most of which are specific to low-income countries. They name peer influences (peers who follow inappropriate antibiotic practices which they learned from senior physicians), drug (non)-availability, pressure by pharmaceutical promotions and monetary incentives by patients. Another reason is the fear of complications, especially as most patients in rural settings cannot be followed up or seen twice. Also poor maintenance or non-availability of laboratory services (for microbiological testing) is named as a cause for over-prescribing. Even though the availability of laboratory services does not imply that they are actually used, as demonstrated in a study done in Malaysia by Lim & Cheong (1993).

According to the authors, drug dispensers (pharmacists but also untrained street vendors) are a major driver for antibiotic overuse. This is especially interesting as in most low-income settings patients approach the pharmacist before they consult a doctor. This is due to "(…) a variety of reasons, including the fact that more value is placed on drugs than on the medical consultation" (Radyowijati and Haak 2003:738, van der Geest 1982). Also, monetary incentives and competition between the pharmacists (when one gives an antibiotic for a certain disease, the other has to as well) play a role here.

The least literature was found on determinants of antibiotic use by the patients.

> "Little information is available on characteristics of the users, their cultural ideas regarding antibiotics, and their exact knowledge about these drugs. Despite a large amount of literature on drug usage, prescribing and dispensing, there is a real lack of qualitative research specifically into the use of antibiotics" (Radyowijati and Haak 2003:741).

Some studies on antibiotic use focus on self-medication, exploring how people get their treatment and who advises which medicine to acquire. Advices – most often given by the family network – were often influenced by former prescriptions of physicians, which legitimises "popular choices of pharmaceuticals" (Radyowijati and Haak 2003:740, Hardon 1991). Others use leftovers of former therapies to treat other illnesses or to prevent diseases. "Antibiotics are often perceived as 'strong', almost magical medicines, capable of curing or preventing many kinds of illness" (Radyowijati and Haak 2003:741).

Patient's antibiotic usage
Kardas et al. (2007) conducted a global research on the usage of antibiotic leftovers in 11 countries: "Brazil, China, Italy, Japan, Mexico, the Netherlands, the Philippines, Russia, South Africa, Turkey and the USA" (2007:530). Participants were either called or interviews were conducted face-to-face with the help of a standardised questionnaire.

Most of the interviewees had taken antibiotics for "streptococcal throat/throat infection/sore throat (21.8%), influenza/cold (15.2%) and bladder/urinary tract infection (7.1%)" (2007:531). Either the doctor or the pharmacist informed them about the correct intake.

The authors differentiate between "pack" or "non-pack" countries. Those countries that use "pack" antibiotics, dispense the whole package although less antibiotics would be needed, thus they "over-dispense". Such countries were "Brazil, China, Italy, Mexico, Russia and Turkey" (Kardas et al. 2007:531). Over-dispensing, instead of giving the exact number of tablets for each illness, was found to be one of the major reasons for the prevalence of leftovers and the re-usage of those. Interviewees from "pack" countries frequently stored leftover antibiotics, used them again for later conditions or gave them to other people.

The inquiry on leftover antibiotics is essential as it creates a "natural reservoir for self-medication" (2007:533). However, the article does not explore when people use these leftovers, for how long they store them and how often they take these leftovers.

Mitsi et al. (2005) explore antibiotic use among the Greek population. They asked interviewees about their most recent intake of antibiotics, if they took the right amount of tablets and from which source they acquired the antimicrobials. They found that men did not stick to the dosage instructions more often than women. Over half of all participants stated that they took non-prescribed antibiotics; most of them were women, educated and old people.[3] Women's responsibility to care for their children is mentioned as a reason that could lead to more self-medication and misuse.

Half of all participants discontinued the intake, mainly when the symptoms stopped. However, the majority of parents stated that they "did not discontinue therapy once their children's symptoms had subsided" (2005:442).

Kardas (2002) found similar results. By reviewing articles that measured compliance by an electronic measurement system, he finds that most people leave out a single dose of their antibiotic regimen.[4] Characteristic is also that patients take too many antibiotics in the beginning (presumably to get better more quickly), that they stop too early or change administration times. He names side effects, early symptomatic relief and difficulties in adapting the dosages to the lifestyle as reasons for "faulty" intake. In addition, some patients believe that antibiotics may have a strong effect on their body, harming the immune system. Less frequent doses and short regimens (not more than 7 days) are significantly associated with correct intake and fewer default rates.

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[3] In Greece antibiotics are available over-the-counter.
[4] The advantage of electronic devices that measure antibiotic intake is that they also detect pill omissions which the patients themselves are not aware of, e.g. unconsciously forgetting a single dose. As they are not aware of their omission they would not notify the doctor or interviewer (Kardas 2002).

Literature on antibiotic use in Afghanistan

A study by The Strengthening Pharmaceutical Systems (SPS) Program conducted in 2009 investigates on medication use in 14 PHCs and 14 hospitals in Kabul, Balkh, Herat, Nangarhar, and Badakhshan (Afghanistan). The study identifies multiple problems in the use of medicines at the PHCs and at the hospitals. The most revealing findings will be mentioned in the following.

PHCs

For all PHCs the number of prescriptions was low. Polypharmacy did not result as a problem. The low number is explainable either by the low availability of drugs at the health facility or by faulty documentation of physicians who send patients to private pharmacies.

The number of antibiotic prescriptions varies from 38% in Badakhshshan to 80% in Kabul and 77% in Balkh PHC. The reasons for the high number of antibiotic prescriptions were not investigated on. Further research should be done here.

The average consultation time at the 14 PHCs is 3.3 minutes, which is very little time for giving explanations on the illness and the medication. Dispensing times – time spent by PHC pharmacists for counselling the patient on medicine intake – is 13.3 seconds. This means that pharmacists hardly invest time in providing information on medicine intake to the patients. "Patient knowledge of dosage in the Badakhshan and Nangarhar provinces is limited and this correlates with the short dispensing times" (Green et al. 2010:10). Furthermore, information on the packaging (drug name, the amount of tablets that have to be taken, description of exact intake) was not fully available, scaling down the possibility for a correct intake.

The average days of stock-outs varied between the PHCs from 0 to 21.8 per month. Non-availability of medicine leads to usage of second-line, most often more expensive drugs or usage of other alternatives. Furthermore the facilities had a very low number of drug guidelines and information available that would serve to enhanced intake (Green et al. 2010:10). This correlates with the finding that most patients did not have exact knowledge on dosage.

Hospitals

The usage of antimicrobial medicine is 90%. According to the study the high number of antimicrobial use is due to the high number of infectious diseases. However, the study also states that there are no reports of blood culture and sensitivity tests at any of the hospitals. For the reader the question remains how the doctors diagnose the patients. Further research should be done here.

Some of the hospitals use third generation cephalosporin, an important antibiotic, very often. In one private hospital the usage was 100%.

> "The heavy use of a third generation cephalosporin is an indicator of
> irrational use which is not only inappropriate and costly, but also leads to
> the development of antimicrobial resistance. Resistance to this important
> class of drugs will be devastating to patients as alternate antimicrobials may
> not be available" (Green et al. 2010:19).

Furthermore, no guidelines existed on the administration of antibiotics before surgeries. In many countries the standard procedure is to give a single dose antimicrobial, whereas all hospitals included in the study except one "used multiple doses (sometimes lasting for several days), single or multiple antimicrobials, and administration times [started] before or after the procedure" (2010:20).

Additionally, the 15 most essential antimicrobials were not available at these hospitals 8.7 days per month on average.

This study names the deficiencies of medication use in 14 PHCs and 14 hospitals in some regions in Afghanistan. It shows the need for further research to clarify questions such as why doctors prescribe that much, how doctors diagnose the patients and by which criteria. Furthermore, it should be investigated which information on antibiotics the patients receive, to which extent this information is understandable and what patients do with the antibiotics.

Concluding remarks

In summary, quantitative studies and "global" surveys on medicine intake predominate the literature and there is a scarcity of qualitative studies on medicine use in acute diseases and studies that focus on patients' perception on antibiotics and their practices with antibiotics. Furthermore, there is a gap in the literature on medicine taking in Middle East countries.

The articles about anthropological theory on pharmaceutical usage find, above all, that patients adjust drug intake according to their perceptions, life situation, social, cultural and economic context. Therefore, patients should be encouraged to talk more openly about their reasons to "deviate" from the therapy and doctors should give more information on the negative effects of the medicines.

Additionally, behaviour patterns in terms of antibiotic intake such as over-prescribing and self-medication are crucial issues. In terms of over-prescribing the review revealed that most often compliance with the patients' demands, lack of the physicians' biomedical knowledge, fears of misdiagnosis and consequent complications are responsible for prescribe antibiotics although it would not be necessary.

In regard to the problematic self-medication with antibiotics two enlightening topics particularly stand out: the culture of dispensing of antibiotics (availability of antibiotics over-the-counter or from unknown sources, especially in low-income countries) and the partly naturalised usage of leftover antibiotics (leftovers of discontinued antibiotic therapies or leftovers of family members and friends). These patterns are accompanied by many interrelating factors and caused by various actors.

An underlying factor of the reviewed studies on antibiotic use is the minimisation of drug intake (e.g. by stopping too early, omitting pills). It is therefore legitimate to ask, as did Pound and Britten et al., if patients are reluctant to take medicines. This might be due to their perception that medicines can have negative effects on their body or their general interest in lowering their drug intake.

Regarding antibiotic use in Afghanistan, the reviewed study revealed the need for further research, especially the reasons for the high number of antibiotic prescriptions and the ways doctors diagnose their patients.

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Annexe

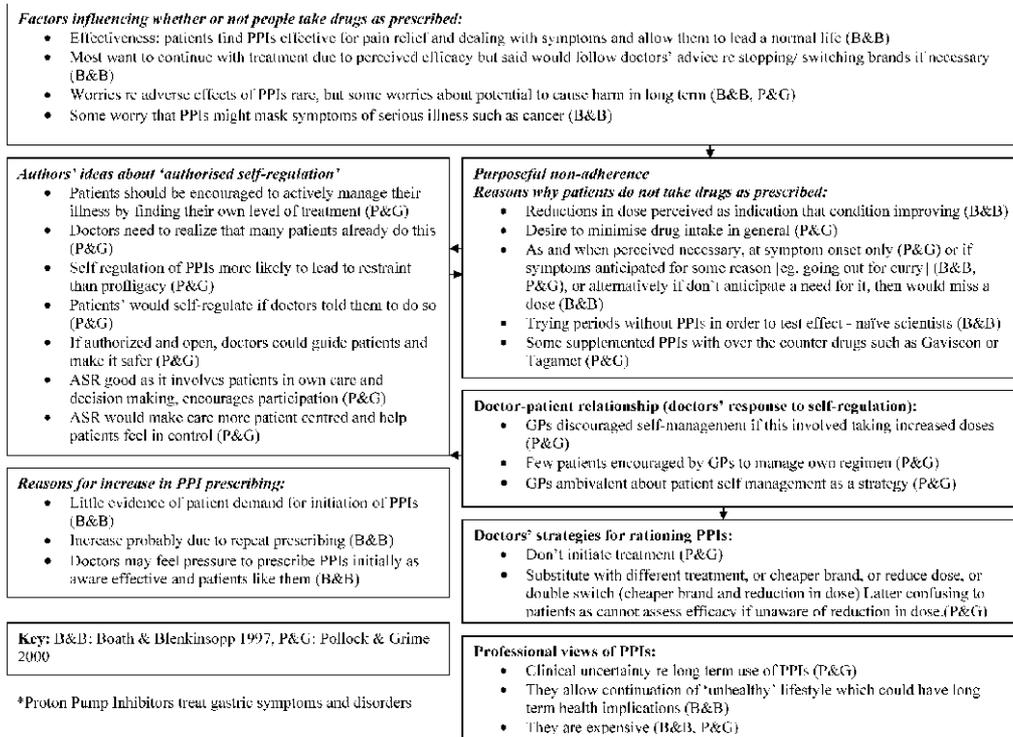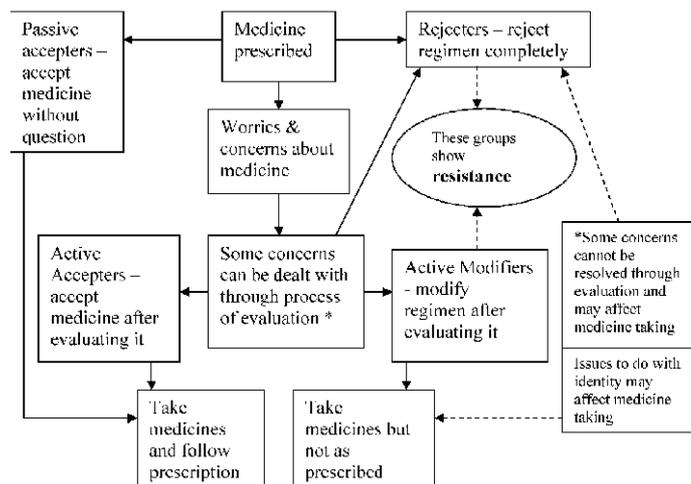Source: (Pound and Britten et al. 2005:139)

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Fig. 1. Proton pump inhibitor* studies (Map).

Fig. 2. Model of medicine taking.