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INTERACTIONAL GROUP DISCUSSION: RESULTS OF A CONTROLLED TRIAL USING A BEHAVIORAL INTERVENTION TO REDUCE THE USE OF INJECTIONS IN PUBLIC HEALTH FACILITIES

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Abstract-Injections are commonly overused in Indonesia. More than 60% of patients attending public health facilities receive at least one injection, which increases clinical risk and has adverse economic impact. This study assesses the efficacy of an innovative behavioral intervention, the Interactional Group Discussion (IGD), for reducing the overuse of injections. This study was a controlled trial in a single district with 24 public health centers randomized to intervention and control groups. Prescribers in the intervention group were invited to one IGD, each of which consisted of 6 prescribers and 6 patients: a total of 24 IGDs were held in a 4-week period, and all invited prescribers participated. The groups, which lasted 90-120 minutes, were facilitated by a behavioral scientist and a clinician, who also served as a scientific resource person. The hypothesized mechanism of behavior change involved reality testing prescribers' assumptions about patient beliefs, imparting scientific information about injection efficacy, and establishing peer norms about correct behavior. Outcomes were measured by a retrospective prescribing survey covering the periods 3 months before and 3 months after the intervention, with samples of 100 prescriptions per center per month. Rates of injection and average number of drugs per prescription were computed separately for each center, and t-tests were used to compare pre-post changes in outcomes in both groups. Results showed a significant decrease in injection use from 69.5 to 42.3% in the intervention group, compared to a decrease from 75.6 to 67.1% among controls [- 18.7.0% intervention vs control. 95% CI = (-31.1%, -6.4%), P < 0.025]. There was also a significant reduction in average number of drugs per prescription [-0.37 drugs prescribed per patient, 95% CI = (-0.04, -0.52), P < 0.05], indicating that injections were not substituted with other drugs. We conclude that the IGD significantly reduces the overuse of injections. It is suggested to try out other behavioral interventions to improve the rational use of drugs.

BACKGROUND

Clinically and economically inappropriate prescribing in many forms is commonly seen in health care facilities in a developing country like Indonesia. A study done by Ministry of Health of the Republic of Indonesia, in collaboration with Management Sciences for Health and Yayasan Indonesia Sciahtera, found various types of inappropriate use of drugs, including polypharmacy, overuse of antibiotics, and overuse of injections [1]. It was observed that over 60% of acute cases received at least one injection, and that the use of injections did not vary with diagnosis.

In addition to Indonesia, the overuse of injections has been reported in many developing countries such as in Senegal [2] Thailand [3], and Uganda [4] This problem is considered serious due both to the risk of adverse clinical outcomes, such as the spread of blood-borne infections or shock reaction, and to adverse economic impacts due to the high cost of clinically unnecessary injections. Despite the wide agreement about the occurrence of the problem, no effective intervention for reducing the use of injections has so far been identified.

Many of the interventions to improve prescribing that have been carried out by ministries of health have been confined to formal educational programs, in the form of seminars or workshops. Experience has shown that such approaches have only limited impact on prescribing habits [5, 6]. Another study done by Linarse [7] for community members in Peru showed that educational interventions could reduce self-medication and non-pharmacological treatments, but some drugs which were considered intelfacaious or dangerous, such as 'antiflu,' antidiarrheals and most expectorants and couch products, continued to be used.

A study done in 1993 by Santoso, Suryawati, and Prawitasari Hadiyono, however, showed that a small group face-to-face ducational intervention was effective in improving the rational use of drugs in acute diarrhea [8]. In focus groups carried out as part of this study, many prescribers stated that their

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motivation for giving injections was mainly due to the patients' demand to receive them. Many also felt that injections were more powerful than oral products, but they had no evidence derived from formal studies to support this rationale. On the contrary, previous focus group discussions with Indonesian patients (unpublished data) showed that the majority did not expect an injection when they presented for treatment: they felt that the decision to give an injection came from the prescriber. A formal study done by Salan indicated that 32.7% of patients in West Nusa Tenggara and 44.6% of patients in West Java, Indonesia were given injections on request [9]. Thus, it seems that the motives for injections may derive from a mixture of prescribers' perceptions of patients' expectations and from patients' actual demand.

In our previous study, most prescribers claimed sufficient knowledge about the proper use of injections and awareness of the risks of their misuse [8]. In reality, however, injections are still commonly oversued. This is an example of a psychological phenomenon experienced by prescribers, which Festinger termed cognitive dissonance [10]. In this situation, prescribers would usually try to find some support to justify their behavior. They would repeatedly give injections to patients to provide cognitive justification that what they have done is correct. Such a prescribing pathology would obviously require a behavioral intervention.

Interactional group discussion (IGD) is a form of behavioral intervention, wherein a variety of persons with different motives interact in a discussion of a target behavior, led by an expert facilitator. This method is a modification of a standard group psychotherapeutic technique [11], but it has not previously been used to alter prescribing behavior. In light of the differences in motivations for injection use among prescribers and consumers, it was considered possible that an IGD intervention could reduce the misuse of injections. The IGD would focus on the discrepancy between prescribers' and consumers' perspectives regarding injections, and in addition, on the scientific explanation of the proper use of injections. The hypothetical reason why such a group discussion might be successful in reducing injection use is that once an individual prescriber is part of a group, he or she would be more persuaded by a strong behavioral message from the group about a relevant issue [12]. The discussion could also promote cooperation [13] and consensus information [14]

The purpose of this study was to test the impact of the interactional Group Discussion on the use of injections in public health centers in one district. If such an intervention method proved to be successful, it could offer an alternative to ductacional interventions to improve specific prescribing behaviors and overall quality of care.

METHODS

Design

This study was a randomized controlled communitybased trial involving 24 health centers in Gunungkidul District, a hilly area about 45 km from Yogyakarta. Central Java. Indonesia. Prescribers from health centers in the district where the use of injections was substantial were randomly assigned to either intervention or control groups. These prescribers include physicians, generally two or three perbeath center, as well as parametics, who see about 70-80% of all patients despite the fact that they receive no formal training in therapeutics. Prescribers from 12 health centers participated in interactional group discussions, while those from the remaining 12 health centers served as controls.

The IGDs involved all prescribers working in the intervention centers (an average of 12 per center) and an equal number of consumers. Each center recruited 12 patients from their area. Patients from one center were matched during the IGD with prescribers from a different center, so that prescribers would not be in the same group with their patients.

The impact of the intervention was assessed by a single retrospective prescribing survey to measure the use of injections and average number of drugs per prescription carried out after the end of the follow-up period. The survey covered prescribing during the periods three months before the IGDs were conducted and the three months after they were completed. Prescribing records maintained for administrative purposes at the health centers were used for the study, and data were collected in the same way in both intervention and control centers, according to procedures recommended by the World Health Organization [15, 16]. The impact of the IGDs was evaluated by comparing changes in injection use and in average number of drugs per prescription between control and intervention centers during these two periods.

Sample selection

All public health centers in Gunungikidul District in which the rate of injection use was substantial were eligible for the study. From data available at the district health office prior to the study, it was determined that at 24 of the 29 health centers at least 20% of prescriptions contained at least one injection; and these 24 health centers were included in the study. Health facilities were then stratified according to whether their rate of injection use was moderate or high, in order to maximize the equivalence of the study groups. Facilities were randomly assigned from each stratum to either the control or the study group.

Interactional group discussion (IGD)

The IGD intervention was carried out in November and December, 1992. All prescribers

(doctors and paramedics) in the intervention health centers and an equal number of community members (mostly mothers and a small number of males) were involved in the study. They were invited to participate in these discussions by staff at the health center in their area, but they were paired in the IGDs with prescribers from a different facility. Most mothers generally were recruited from local women's organizations active in community health activities. These mothers and a small number of males were health post volunteers (kaders). Most mothers were members of the quasi-governmental women's social movement (PKK), with a small number of the women's auxiliary members (Dharma Wanita), as well as a large number of patients with no affiliation chosen and brought by prescribers to participate in the IGD.

The IGD was conducted one time only for each group, and lasted for 90-120 minutes. Each group consisted of six prescribers and six patients. The discussions were conducted in the informal setting of a local restaurant. There was 100% participation by invited prescribers and community members. The discussions were in *Bahasa Indunesia* and at times in *Bahasa Jawa*, the local language.

In this study, the moderators for each IGD consisted of a behavioral scientist and a clinical pharmacologist, who facilitated interactions among members in the IGD. The behavioral scientist focused more on the subtle confrontation regarding the discrepancies between prescribers' and patients' beliefs, while the clinical pharmacologist presented scientific information regarding proper use of injections.

The IGD process included an exploration of feelings of members about being included in such a group, presentation and discussion of the discrepancies between prescribers' and patients' beliefs and motivations regarding injection use, the presentation of scientific materials, and a conclusion. The exploration of feelings was important since members in the IGD were heterogenous, and each had his or her own role in the community. There was active interaction among participants during the discussion. Examples transcribed from recordings of material covered in these sessions are included in the Appendix A to this article.

The IGDs explored motives among participants for the use of injections. Earlier findings had indicated substantial and important discrepancies between prescribers and consumers regarding beliefs about injection use. After members had expressed their feelings about being in the group, the facilitators asked who among the patients really preferred and asked for injections when they visited a health center. Most patients indicated that they never demanded injections, and that their use was entirely based on prescribers' decisions. In contrast, prescribers stated that the use of injections was based on patients' during the IGD. Participants were also guided to discuss the proper principles of injection use and the possible risks of their misuse. They also discussed how to handle persistent patients who asked for injections.

Strong messages expressed by patients and by other IGD participants regarding injection use and the presentation of scientific materials related to injection use were intended to change doctors' and paramedics' injection prescribing. There was felt to be considerable cognitive dissonance among prescribers on this topic, and this reality testing was intended to motivate them to re-evaluate their behavior regarding injection use. In addition, the establishment of peer norms about correct njection behavior in the group would also help to bring about cooperation and consensus on the proper use of injections.

Prescribing survey

A single prescribing survey to estimate the proportion of patients receiving injections and the number of drugs prescribed per patient was carried out 4 months after the intervention. This survey covered the period 3 months before the intervention (August-October, 1992) and 3 months after the intervention was completed (Daunary-March, 1993). The prescribing survey used retrospective cases sampled randomly from health center treatment registers, including 100 cases per month at each health center independent of diagnosis.

A total of 14,100 cases were collected in all, 6000 in the baseline period and 7200 after the intervention. Data were found to be unavailable in one health center in the intervention group for the three months preceding the intervention due to a lost clinic registration book. The data from this center are included in aggregate post-intervention totals, but this center is dropped from analyses of facilityspecific changes, which depend on the availability of both pre- and post-intervention data.

Data were collected by staff from the district health office who had been specially trained in methods recommended by WHO for collecting this type of data in health facilities [15]. Data collectors were blind to the study condition of individual health centers. Data collection was supervised and the accuracy of data validated by members of the study team.

Analysis

The percentage of cases receiving an injection, the percentage of patients receiving more than one injection, and the average number of drugs prescribed were computed separately for each health center, both on a monthly basis and for the entire pre- and post-intervention periods. The monthly average of the three outcome measures was computed for all health centers in the two study groups and displayed as time series.

Subgroup totals for injection and drug use were computed in a similar way by gender (male/female) and by age group (less than age 5/5 years and over). In addition, the percentage of total injections was calculated by drug type (for example, diphenhydramine, procaine penicillin, oxytetracycline, etc.) and by therapeutic class of drug (for example, antiallergic, antimicrobial, etc.).

The pre-post change in each of the study outcomes within each center was then computed, and Student's *t*-tests were used to test the difference between the average change in the intervention group and the average change in the control group.

RESULTS

The study and control groups were similar during the baseline period in rate of injection use (67.1% of patients in the study group vs. 75.6% among controls), the use of multiple injections (5.8% vs. 8.7%), and in the number of drugs prescribed per patient encounter (4.03 vs. 397). None of these differences were statistically significant.

Figure 1 displays the time series of injection use in the overal intervention and control groups (top), and the pre-post change in injection use by health center (bottom). There was a sudden and stable reduction in use of injections in the intervention group following the IGDs, from a pre-intervention group following the IGDs, from a pre-intervention period. Average injection use in control facilities also decimed from 756% at baseline to 671.¹% at follow-up. This represents a significantly greater reduction in intervention facilities in comparison to controls [-18.7%, SE = 5.9%, 5.9%C1 = (-3.1%, -6.4%), P < 0.025.

The use of multiple injections was a highly variable phenomenon. At baseline, three intervention facilities and two control facilities had rates of



Fig. 1. Use of injections in study and control groups before and after interactional group discussions.

Table 1. Percentage of study and control group patients receiving injections before and after interactional group discussions by age, gender and type of injection

	Intervention (%)		Control (%)	
	Pre	Post	Pre	Post
Age				
0-4 years	30.3	16.3	39.9	24.9
5 years and above	76.7	52.7	80.3	73.1
Gender				
Male	70.3	48.1	74.6	64.9
Female	74.9	48.7	76.1	68.9
Type of injection				
Analgesic	7.8	4.1	6.4	6.4
Antiobiotic	13.0	8.8	19.5	15.9
Antiallergic	21.1	12.8	23.4	20.2
Steroid hormone	4.4	3.4	3.1	3.8
Vitamin	25.4	13.4	24.9	21.1
Other*	2.4	2.7	4.0	3.7

*Anaesthetic, antiasthmatic, antiepiletic, antispasmodic, antituberculosis, psychotherapeutic.

multiple injection between 20.3 and 27.3%, while six intervention and eight control facilities had rates of 3.0% or less. There was a relatively greater reduction in multiple injection use in intervention facilities of -3.3% following the IGDs, but the low numbers and uneven distribution make these differences difficult to interrore.

The data on use of injections by age, gender, and type of injection are presented in Table 1. Injections were given over twice as frequently at baseline to patients age 5 and over ($7.8^{-5} e$ of patients) compared to children under age 5 (34.6^{+} e). In the IGD health centers, the intervention was associated with a decline of 24.0% in injection use among those age 5 and over, compared to a decline of 7.2% among controls. The use of injections among children declined by 14% in both study groups (from 303.% to 16.3% in the IGD enters, and from 38.9% to 24.9% in controls).

Injections were given at approximately the same rate to both male (72.5%) and female (75.5%) patients, and the intervention was associated with equal reductions in injection use in both genders.

Vitamins (Bl. B6, Bl.2, K) were the most frequent type of injections given at baseline, administered to one patient in four, followed closely by antiallergics (primarily diphenhydramine) which were prescribed to 22.2% of patients. Another 15.2% received an antibiotic injection (mostly procaine penicillin or oxytetracycline, while 7.1% received the injectable analgesic dipyrone, and another 3.8% were injected with the steroid hormone dexamethasone.

The largest proportional declines in injection use cocurred for analgesics and vitamins, with baseline rates nearly halved in the experimental group. Antiallergic injections dealend by about 40%, while antibiotic injections declined by one-third, and steroid hormones by 22%. Small declines in use were observed in the control health facilities among injectable vitamins, antiallergics, and antibiotics. No compensating increases in the use of oral substitutes for any of these drugs were observed.



Fig. 2. Drug prescribing in study and control groups before and after interactional group discussions.

Figure 2 shows the time series of average number of drugs prescribed in intervention and control facilities (top), and the pre-post change in prescribing by health centre (bottom). Again, there was a sudden drop in prescribing in intervention facilities compared to controls following the IGDs, but the differences between groups appears to decrease slightly over time. Overall, the average number of drugs prescribed declined from 4.04 at baseline to 3.67 at follow-up in intervention facilities. while prescribing in the control group declined from 3.97 to 3.88 drugs per patient. There was a significantly greater drop in overall drug prescribing in the intervention facilities following the IGDS [-0.28 drugs, SE = 0.11, 95% CI = (-0.04, -0.52), P < 0.051.

It is noteworthy that the relative decline in total drug use of 0.37 drugs per patient in intervention facilities is of approximately the same order of magnitude as the estimated 27% decline in injection use, another indication that oral drugs were not substantially substituted for eliminated injections.

DISCUSSION

Both groups of facilities, intervention and control, showed decreases in injection use during the study period. Reductions in use of injectable drugs are also corroborated by declines in orders for these products from the district drug warehouse in the period following the IGD intervention. However, the reductions were significantly greater in the intervention group than in the control group. Significant overall reductions in number of drugs preseribed in intervention vs control facilities, and the lack of observable increases in oral forms of the discontinued drugs, lend support to the overall findings about injection use, and indicate that the discontinued injections were not generally substituted by other medications.

Part of the observed reduction in injection use among the control group may have been due to contamination, since both groups of facilities came from the same administrative area. Prescribers' concerns that patients might go for injections to other health facilities are not confirmed by the data.

The IGD is shown by this study to be effective in reducing a very specific behavior with obvious risk, namely, the use of injections. This might be due to the confrontation during the discussions between abients and preseribers, and reality testing regarding beliefs about patient demand. Of six patients in the discussion groups, there were generally only one or two who expressed clear preference for injections. Even so, when probed further, they usually said that the decision to get an injection "was up to the doctor". The rest of them, usually younger patients, at all.

The hypothesized cognitive dissonance experienced by the prescribers was obvious during the discussions. Their knowledge about injection use and risks was generally sufficient, yet they still overused injections. They were convinced that it was patients who asked for an injection. One doctor said "When I worked in the city, I barely gave injections to my patients. But here, I give them injections. I do not know why. Maybe I am afraid of losing my patients if I do not give them what they want." Another doctor said, "The sample of patients is not appropriate here. These patients are patients who have been trained in health education. They know that injections are not always necessary." When confronted about whether he had selected the patients from his area in this way, he said "No". Yet he still believed that it was patients who pushed prescribers to give injections.

This incident illustrates how distortions of reality can cloud the belief systems of prescribers. They justify their behavior in a way to suit the reality of their practice. Despite the fact that many prescribers prescribing behavior was observed to change significantly. Use of injections and overall prescribing was significantly reduced in the intervention group. After the IGD, prescribers might have considered patients' preferences for injections where they had not done so before. Subconsciously, they might also have been more careful about not giving injections to every patient who came to their health center.

The IGD discussions were widely enjoyed by the prescribers and patients who participated, At the end of each discussion, participants mentioned that the discussions were useful for increasing their knowledge regarding injection use. Most groups made a consensus among themselves to reduce the injection use. The discussions were regarded as a refreshing of knowledge for prescribers, and as providing a new perspective for patients. Because the patients who participated were active in community health activities, the overall change in injection use observed following the intervention may in part be due to changes in their behavior when seeking treatment, and to changes in the behavior of other community members with whom they spoke about the IGD expresence.

The fact that the IGDs were conducted in a prestaurant with Idl meals for all participants must be borne in mind in assessing the efficacy of the method. The provision of a congenial and relaxing atmosphere during the discussion helped to put participants at ease in discussion the topic at hand. Eating and togetherness are potentially important factors in achieving the impact of the IGD. Although highly trained individuals moderated the discussions in this study, the investigators believe that the IGD method is transferable, and that the choice of moderator is actually quie flexible. For example, medical doctors who have a supervisory function could be trained to implement this method.

The IGD as a possible behavioral intervention to reduce the specific problem of overuse of injections looks promising. Perhaps regular patient-prescriber discussions about single issues in patient care in health facilities would be useful to promote more appropriate use of drugs. With training in how to conduct such discussions, doctors in health centers could then conduct IGDs for paramedies and patients in their own health centers. Alternatively, such training might be organized for staff working at the district level who are responsible for clinical supervision at health facilities.

CONCLUSION

The Interactional Group Discussion is proved by this study to be effective as an intervention method to reduce the use of injections in public health facilities. Other behavioral interventions based on psychological theory to improve quality of care should also be designed and tested. For example, training in self-monitoring procedures for prescribers might also prove to be an effective intervention to promote improved use of drugs.

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APPENDIX

In most groups of six patients, there were only one or two who preferred receiving an injection, and most of these were older patients. When probed further, they said that the decision about which drugs to prescribe was really up to the prescriber. Examples of some ways they expressed these feelings are as follows:

Kalau saya belum disuntik itu belum marem. Setelah diperiksa dokter saya manut dokter, kalau ditawari suntik saya ya mau. Kalau saya saendiri, setelah diperiksa saya ditawari suntik bu. Saya ya terus mau. Saya sendiri berharap untuk disuntik tapi dokter tidak mau memberi suntikan, mungkin karena saya lemah. Saya tidak puas.

Kalau sudah diperiksa lalu disuntik. Saya takut dan tidak suka suntik, meskipun saya ditawari saya tidak mau.

Free translation: I do not feel satisfied if I am not injected. After being examined the decision is up to the doctor, if he offers me an injection I would accept it. I hope I will be injected, but the doctor does not want to give me an injection, perhaps because I am weak. I don't feel satisfied in this situation.

Usually after my examination, I receive an injection. I feel afraid and do not like injections. Even when I am offered, I do not comply.

There were no power struggles during the group discussions, as Indonesian people are usually submissive and conformist toward authorities. The facilitators frequently aligned with the doctors in the group to educate the patients in an impromptu fashion, and thus facilitated an active dialogue between the prescribers and patients. After the doctors gave a bird lecture about injection, there were lots of questions coming from the patients. They made statements such as:

Saya sekarang tahu dan akan mendukung dokter untuk menyebarhuaskan informasi ini ke masyarakat. Saya puus sekarang atas penjelasan dokter. Saya mengerti sekarang kalau sumik tudak perlu.

Free translation: Now I know about his subject, and I would like to support the doctor to disseminate this information to the community. I am satisfied now after hearing the doctor's explanation. I know now that injections are not necessary.

At the end of IGD, all members of the groups, prescribers, and patients alike, usually agreed to support the health facilities to reduce unnecessary use of injections. The decross emphasized that the parametics had to be firm in their decision to do this, and that it was really their decision on the patients'. For Indonesian poole, this type of group agreement is very important, and once reaching a Mong run. This coments overcomen the prescriber's fear of losing their patients because the patients will not go anywhere but to their health facilities.