THE IMPACT OF PARTICIPATIVE GOAL-SETTING, FEEDBACK, AND EXPECTANCIES ON THE STAFF OF HEALTH SERVICE FACILITIES IN DEBRE-ZEIT

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ABBREVIATIONS

ANC	Antenatal care
BCG	Bacille-Calmette-Guerin
DF	Degree of freedom
DPT	Diphtheria-Pertusis-Tetanus
EPI	Expanded program on immunization
FP	Family planning
GM	Growth monitoring
HI	Health institution
Hosp	Hospital
HS	Health station
MBO	Management-by-Objectives
MCH/FP	Maternal and child health and family planning
MEA	Measles antigen
MFS	Motivational Force Score
NS	Not statistically significant
PHC	Primary Health Care
SD	Standard Deviation
TT	Tetanus toxoid

ABSTRACT

An intervention study to assess the impact of participative goal setting and feedback on the staff of health service facilities was conducted in three districts of East Shewa Zone over a period of three months, from October to December, 1993. A pretested questionnaire was administered twice to measure the motivational force score (MFS) for seven selected primary health care (PHC) activities. The correlation of these scores with the performance of each activity was calculated to determine their association.

The study included a total of 12 health institutions: six in the intervention group and six in the control group with 48 and 46 health workers respectively. Health institutions in the intervention group participatively set goals and developed strategies to attain them for the selected PHC activities for three months (October to December, 1993). Feedback sessions were also conducted during this period. Health institutions in the control group had assigned goals without feedback but conducted clinical sessions in the same period.

Comparison of the pre- and post-intervention period mean changes in coverage for the selected PHC variables together revealed a significant difference ($t = 2.28$, $p < 0.05$) between the intervention and control groups, and a positive association was found between the

participatively set goal levels and mean change in coverage of the variables (r = 0.762, 95% CI = 0.642 to 0.882) in the intervention group.

Comparison of both the first and second MFS for the variables between the intervention and control groups showed significantly higher MFS in the intervention group ($t = 2.49$, $p < 0.05$ and $t = 4.53$, $p < 0.001$) than in the control group. But no significant association was found between MFSs and mean changes in coverage of the variables in both study groups.

These findings are suggestive of the potential usefulness of participative goal-setting and feedback activities to improve organizational performance. Participatory goal-setting with feedback appears to have both cognitive and motivational impact on the staff of health service facilities. On the other hand, higher expectancy or valence for PHC activities by health workers alone was found not to lead to increased performance.

1. INTRODUCTION

One of the challenges frequently faced by both profit and non-profit making organizations is how to increase the level of performance of their employees. It is a major challenge because the level of performance determines the success and even survival of the organization (1). The problem is more complex and complicated for non-profit health service organizations than it is for profit-making ones in which measuring levels of performance is relatively less difficult.

In health service organizations, like in other non-profit organizations, level of performance cannot solely be explained on an input-output basis. Hence, factors directly or indirectly associated with level of performance should be identified and further explored to find means and ways of enhancing performance of health workers. Motivation of employees is obviously one of the factors which directly influences the performance of health service facilities. Therefore, the issue of enhancing motivation of health workers is a logical and key question which should be dealt with in order to increase performance of these organizations if their performance is found to be low.

Since the time Ethiopia accepted the principles, goals and objectives of primary health care (PHC), health service facilities at all levels of the health care delivery system have been trying to implement PHC

programs in the country. But, unfortunately, the performance of these PHC programs has been extremely low for several reasons. Even though some of the programs were able to achieve some level of success, this has not been sustained. For example, the expanded program on immunization (EPI) reached coverage rates as high as 60% through social mobilization in 1990 (2). They have now come down to 14%. The antenatal care (ANC) and growth monitoring of under-five children coverage rates are only 13.2% and 24.3% at the national level, respectively (3). The performance of the other PHC programs is not different from these three examples which didn't suffer from lack of material resources. It is evident, therefore, that the low level of performance in our health system and its health facilities is a priority problem which needs remedying in order to increase the health service coverage.

This low level of performance, at least partially, could be a result of the low motivation of health workers. As we frequently hear from public complaints, mass media reports, and assessment of the quality of care, health workers are incriminated for their inadequacy in providing health care services in health facilities (4). Whether this is justifiable or not, we know that low motivation of employees is a current main problem of most, if not all, governmental organizations

in Ethiopia; and health service facilities are not exceptions.

Leaving aside the socio-economic and political factors that could be associated with low motivation of employees, and hence low performance, some management interventions are badly needed to enhance motivation of health workers and performance of PHC services. This is a challenge for the managers of health service organizations if they are to increase the performance of their organizations.

Several motivation theories have been proposed to explain the behavioural aspects of motivation and circumstances or mechanisms of enhancing motivation to improve performance and productivity (5). These theories have been tested both in laboratory and field set-ups for their validity. So far, unfortunately, field research has only been carried out in business organizations and their applicability to health service organizations is not well documented. Although by virtue of their nature, business and health service organizations are different, the theories of motivation found to be valid in the former can also be potentially useful in the latter and this has to be demonstrated by conducting applied research on the latter.

In this study, three motivation theories, namely goal-setting theory (participative), reinforcement theory

(feedback), and expectancy theory were examined to see their effect on the performance of selected PHC programs. Since knowledge of what motivates workers in a given culture, combined with (or based on) a knowledge of what they think matters in life, is critical to the success of the manager (5), it is the responsibility of managers to take appropriate measures to enhance the motivation and, hence, performance of their employees. It would be unfair if not harmful if managers of health service facilities and health departments at different levels simply waited for socio-economic and political factors to improve while they could be performing their duties, through interventions, of creating a motivated staff.

2. OBJECTIVES OF THE STUDY.

General Objective

To assess the impact of participative goal-setting, feedback, and expectancies on the performance of selected PHC activities in health service organizations.

Specific Objectives

1. To compare the three month pre and post intervention period (the interventions being participative goal-setting and feedback) of performance of selected PHC activities by health institutions in the intervention and control groups.
2. To assess the relationship between health workers' expectancy/valence and performance (outcome) with respect to selected indicators.
3. To determine whether participative goal-setting, feedback, and increasing expectancy/valence are effective measures which can be used to enhance the motivation and performance of health care workers.

3. LITERATURE REVIEW

In both scholarly and secular domains many definitions of motivation exist. Technically, the term *motivation* can be traced to the latin word *movere,* which means "to move". This meaning is evident in the following comprehensive definition: Motivation is a process that starts with a physiological or psychological deficiency or need that activates behaviour or a drive that is aimed at a goal or incentive (6). Thus, the key to understanding the process of motivation lies in the meaning of, and the relationship between, needs, drive (behaviour), and goals or incentives.

Needs are created whenever there is a physiological or psychological deficiency or imbalance. Needs range from primary unlearned physiological needs, like food, water, shelter, sex, etc., to the more complex learned secondary needs, like needs for achievement, power, affiliation, security, advancement, responsibility, challenge, recognition, and excellence (7). *Drives* are set up to alleviate needs. Drives are action-oriented and provide an energizing thrust towards reaching a goal or an incentive. *Goals or incentives* are defined as anything that will alleviate a need and reduce a drive. Thus, attaining a goal or an incentive will tend to reduce or cutoff the drive.

In summary, needs set up drives aimed at goals or

incentives; and this is what the basic process of motivation is all about. In a systems sense, motivation consists of these three interacting and interdependent elements (6).

It is known that as human society becomes more complex and relationships between employees and their jobs in organizations become more sophisticated, learned secondary needs become the most important drives in motivating behaviour (6). In health service organizations the need for achievement, and the resulting job satisfaction, appears to be a profound motivator of health workers due to the intrinsic nature of health care activities (i.e. their humanitarian orientation).

On the other hand, an important and wide application area for work motivation is *job design* which has various approaches like job enrichment, job enlargement, job rotation, job engineering, socio-technical system, and goal setting (6). Though job design has received considerable research attention and is being widely applied to actual management practices in business organizations, its application and importance in the management of health service organizations remains open to many avenues of research. Exploring the determinant factors of work motivation should, though, be the duty and responsibility of managers at all levels of the health care delivery system.

In an attempt to explain the behavioural aspects of motivation and its application to improve performance (task process) and productivity (outcome or results), several motivation theories have been proposed (5). Although various classification of these theories are reported, they can be generally divided into two categories:

content theories which attempt to identify the needs and drives people have and how these are prioritized; and *process theories* which are more concerned with the cognitive antecedents that go into motivation and, more importantly, with the way they relate to one another (6). But, despite their accepted validity, no single motivation theory can be taken as a complete model and none is universally valid (1). One of the process theories is goal-setting theory.

3.1 Goal-setting Theory

Even though the 1968 paper by Edwin A. Locke (8) is usually considered to be the seminal work on the theory of goal setting, interest in goal setting as a motivational technique has its origins in two lines of inquiry, basic research in academic psychology, and applied management research (9). The latter traces from the work of F.W. Taylor, whom Locke himself credits with being the father of employee motivation theory (6).

Presently, the application of goal-setting principles in business settings may be seen in the widespread use of management by objective (MBO) programs (10). Today the MBO approach has evolved into an overall systems performance approach using goal-setting and appraisal by results (6).

The concept of goal setting falls within the broad domain of cognitive psychology and is consistent with recent trends such as cognitive behaviour modifications (11). Goal-setting is also an important component of social learning theory (12). Even in the field of organizational behaviour, the literature on organizational behaviour modification can be interpreted largely within a goal-setting framework (13).

In goal-setting theory, a goal is what an individual (or group) is trying to accomplish; it is the object or aim of an action. However, in most goal-setting studies, the term goal also refers to attaining a specific standard of proficiency on a task, usually within a specified time limit. Since a goal is the object or aim of an action, it is possible for the completion of a task to be a goal (11).

The basic assumption of goal-setting research is that goals are immediate regulators of human action. However, no one-to-one correspondence between goals and action is assumed because people may make errors, lack

the ability to attain their objectives (11) or, in the case of health care activities, other mediating factors can affect the association between goals and action.

The two major premises of Locke's goal-setting theory pertain to the effects of goal difficulty and goal specificity on task performance (9). Locke postulates that: 1) hard goals, if accepted, lead to a higher level of task performance than do easy goals, though these goals must be reachable and not so hard to attain that they would be frustrating; and 2) specific hard goals lead to higher performance than do general goals, "do your best" instructions, or no goal.

Goal-setting theory has two major attributes, content and intensity. The content of a goal is the object or result being sought. The main dimensions of goal content that have been studied so far are specificity or clarity (the degree of quantitative precision with which the aim is specified), and difficulty (the degree of proficiency or level of performance sought). But little attention has been paid to two other dimensions of goal content: goal complexity (the number and interrelation of the results aimed for) and goal conflict (the degree to which attaining one goal negates or subverts attaining another) (11).

The second attribute of a goal, intensity, pertains to the process of setting the goal or determining how to

reach it (11).

Locke, et al (1981) described the mechanisms of goal-setting effects as consisting of: 1) direction — goals most fundamentally, direct attention and action; 2) effort — mobilized simultaneously with direction in proportion to the perceived requirements of the goal or task; 3) persistence — which is nothing more than directed effort extended over time, hence, a combination of the above two mechanisms; and 4) strategy development — an indirect mechanism which involves developing strategies or action plans for attaining one's goals.

The peculiar aspect of goal-setting theory, unlike other motivation theories, is that it is continually being refined and developed. Recently, the theory has diversified its scope to explain the role that factors like commitment, feedback, participation, supportiveness, and expected evaluation play in the theory (6).

3.2 Participation and Goal-setting Theory

Participative management, and specifically employee involvement in many aspects of an organizations's operations, is the new reality of the 1990's. Even organizations that were forced to accept this change have found that it works for their advantage (14). Hence, participation plays a tremendous role in contemporary management, as much in nonprofit organizations as in

business organizations.

Participation has long been recommended by social scientists as a means of obtaining employee commitment to organizational goals and reducing resistance to change (11). In addition, participation in management also has been reported to have the following advantages: 1) it is a powerful motivator; 2) better decisions will result; 3) a trusting climate is created; 4) employees understand their jobs better; and 5) progress toward goals is accelerated (14).

According to Locke, et al (1981) participation in goal-setting theory is to be treated as a mechanism that may affect goal content or goal acceptance, rather than as an attribute of goals (11). P.C. Early and R. Kanfer (1983) described participative goal-setting as typically consisting the following steps: 1) task presentation, 2) goal-setting after some group discussion; 3) strategy development and evaluation by each individual; 4) an optimal strategy which is chosen by each individual; and 5) strategy enactment (15). Furthermore, Sashkin (1976) suggested that several types of participation may be enacted (setting a goal, decision making, problem solving, or the implementation of an organizational change), but that participation has been inconsistently operationalized across studies and the effects due to particular types of participation have not been widely

explored (16). Community participation, though, has been widely reported on and reviewed in depth by Zakus (17).

Goal-setting investigators have suggested that participation in the goal-setting process may be important for both motivational and cognitive reasons. However, goal-setting research has focused almost entirely on the motivational aspect of participation, while generally ignoring the cognitive aspect (18). This latter aspect of participation was found to increase task understanding (19) and to generate ideas for increasing work performance (20). Furthermore, with respect to the cognitive effects, participation might be expected to have more significant impact on task performance in complex tasks than in simple tasks which, because of their elementary cognitive requirements, do not need and cannot make use of any cognitive enhancement brought about by participation (18).

As far as the motivational aspect of participation is concerned, it can lead to the setting of higher goals (and, hence, increased performance), and greater goal acceptance or commitment than assigned goals (11). Participation in the goal-setting process may also increase volition (the extent to which an individual is free to engage in a behaviour), which in turn, may increase goal commitment (21).

3.3 feedback and Goal-setting Theory

Feedback (or knowledge of results and how these results are perceived by others) is a form of information about one's attempts to improve or one's progress in relation to the goal. Reinforcement theories are based on a fundamental principle of learning — the Law of Effect: Behaviour that is rewarded tends to be repeated and vice versa (5). It is well known that feedback is one of the several reinforcers that can be used to enhance motivation and increase performance (11).

Feedback, like participation, has been considered as an important moderator in goal-setting theory and several studies have been conducted to determine its effect and mechanism to improve task performance in goal-setting (9,11). In goal-setting theory it is postulated that feedback about progress toward goals is preferable to no feedback and it is considered as a necessary, but not sufficient condition, for successful application of goal-setting (6).

As an application of goal-setting to organizational system performance, periodic appraisals and feedback on progress and adjustments made is one of the series of systematic steps undertaken in management-by-objective (MBO) programs (6).

3.4 Participatory Goal-Setting with Feedback and Task Performance

The effects of goal-setting on task performance have been extensively studied both in laboratory and field setups. In a review of both laboratory and field studies conducted from 1969-1980, Locke, et al , found that in 90% of the studies specific and challenging goals led to higher performance than easy goals, "do your best" goals, or no goals. Even among those studies which failed to demonstrate a similar result, researchers indicated conditions and possible explanations for the findings like lack of necessary information to the task doer, narrow range of goal difficulty, unrealistically too hard goals, and problems of ability and goal acceptance (11).

Similarly, in a meta-analytic examination of published research from 1966 to 1984, A.J. Mento, et. al, found difficult goals to have a dramatic effect on performance outcomes (corrected d = 0.5813) and, surprisingly, the goal difficulty - performance relationship was higher in the no incentive condition than it was in the incentive present condition. In addition, the effect of goal specificity/difficulty on task performance across both experimental and correlational studies was found to be of considerable magnitude (corrected d = 0.4441) which is equal to a productivity increase of 8.88% (9).

Mark E. Tubbs, in another meta-analytic examination

of 147 usable results in 87 studies, obtained support for the hypotheses that difficult goals lead to higher levels of task performance than do easy goals and that specific hard goals lead to higher performance than do "do you best" instructions or no goals (22).

The above findings with respect to goal content (i.e. goal difficulty and goal specificity) have clearly shown the positive impact specific and challenging goals have on task performance both in laboratory and field setups. But, more importantly at the present time is integrating participation and feedback (and other possible moderators) into goal-setting studies to show their effects on task performance. It is quite logical to expect the impact of participation and feedback in group tasks, like health service activities, to be of considerable importance.

Although Locke (1968) described the effect of participation on performance as an indirect effect through its influence on goal difficulty (8), subsequent studies by him and other researchers have broadly explained the possible impacts of participation on goal acceptance or commitment, generating new ideas, goal satisfaction and strategy development (11,18,19,20).

Mento, et al, in meta-analytic examination of seven studies (four lab and three field studies) have found that participative goal-setting groups performed at

higher levels (corrected effect size = 0.209) than individuals in the assigned goal-setting groups. For six studies which held goal level constant in both conditions, the corrected d was 0.202 which is equal to a productivity increase of 4% for participative vs assigned goals. When specific hard goals were combined with feedback the effect size was found to be 0.873, equating to a 17.46% increase in productivity (9), which signifies the importance of feedback in goal-setting.

In an attempt to determine whether feedback (i.e. knowledge of results) directly influences performance or its effects are mediated by goal-setting activity, Lock et. al, found that neither feedback alone nor goals alone is sufficient to improve performance; both are necessary (11).

Based on a more specific operationalized definition of participation, P.C. Early and R. Kanfer studied the effect of participation (choice over a goal and a strategy to achieve the goal) on goal acceptance, goal satisfaction, and performance in an experiment involving 120 male students. This study showed that subjects in the high-choice condition (i.e. those who had a choice over a goal and strategy to achieve it) and in the moderate-choice condition (i.e those who had a choice over a goal only) had a significantly higher level of goal acceptance, goal satisfaction, and performance than

subjects in the no-choice condition (i.e. those who had no choice over either a goal or a strategy to achieve it). Moreover, goal satisfaction and performance were significantly higher in the high choice condition than in the moderate choice condition (15).

On the other hand, with a broad definition of participation as involving a joint discussion of the task, its potential difficulties, and so forth, D.J. Campbell and K.F. Gingrich conducted a field experiment to show the cognitive effects of participation in complex tasks as compared to simple tasks. The study showed that participation under complex task conditions led to better task performance than other combinations of task types (simple or complex) and involvement methods (assigned or participatory). The researchers stated that this improved performance presumably comes about due to generation of both more information and better (i.e. clearer, more focused) information in the participative process. From an applied standpoint, the study showed a performance ratio difference of 15% between the participative complex task group and the assigned complex task group, which is a considerable magnitude of improvement in performance (18). In general, the study's findings are quite relevant in terms of demonstrating the role of participation in complex tasks. Since health care activities are generally group tasks and complex in

nature, it is highly probable that performances could be considerably improved through participation.

3.5 Expectancy Theory

The first to formulate an expectancy theory directly aimed at work motivation was Victor Vroom in 1964. In his expectancy theory of work motivation, Vroom (23) described two major variables, namely, *valence* and *expectancy* and one major input for valence known as *instrumentality* as determinants of motivation. He defined these variables as follows:

Valence: is the strength of an individual's preference for a particular outcome. In other words it is the desirability (attractiveness) of that outcome to the individual. A major input into the valence is the *instrumentality* of the first level outcome in obtaining a desired second-level outcome. For example, a person would be motivated toward superior performance because of the desire to be promoted. The superior performance (first-level outcome) is seen as being instrumental in obtaining promotion (second-level outcome).

Expectancy - is the probability that a particular action or effort will lead to a particular outcome, i.e., the probability of attaining the outcome if one exerts the maximum effort.

In the force model posited by Vroom the level of

motivational force acting on a person is determined by multiplying together the valence and expectancy variables; i.e.

Motivational force (F) = Σ(valence x expectancy).

This implies that an increase in expectancy or valence results in proportionate increase in motivation. Although a study by A. Harrell and M. Stahl (24) showed an additive (rather than multiplicative) relationship between valence and expectancy and motivational force, as S. Rynes and J. Lawler (25) suggested, in terms of practical implications, the issue of multiplicative vs additive model usage is probably less important.

According to the expectancy theory, therefore, if workers do not place a high value on a certain outcome, and/or if they do not think that the first level outcome is instrumental in obtaining the second level outcome (e.g. promotion, advancement),and/or if they think that their effort will not accomplish the outcome, they will experience a low level of motivation to perform the task. Vroom's model is designed to help management understand and analyze workers' motivation and identify some of the relevant variables; it does not provide specific solutions to motivational problems. The model assumes that people are rational and logically calculating, but such an assumption may be unrealistic (6).

Like the goal-setting theory, expectancy theory

emphasizes cognitive processes as the basis to explain human motivation and it recognizes the complexities of work motivation. Although the Vroom model does not directly contribute much to the techniques of motivating personnel in an organization, it is of value in understanding organizational behaviour (6). In health care services it can specify the relevant variables which may account for decreased motivation and indicate the possible measures that could be taken to change the situation.

3.6 Combining Goal-Setting and Expectancy Theories

As described earlier, no single theory of motivation can be taken as a complete model, hence several investigators have been trying to combine two or more theories to show their impact on work motivation. One such combination commonly studied is that of goal-setting and expectancy theories.

These two theories form the main lines of contemporary motivation theory. Even though they were developed independently, they have in common their emphasis on cognitive processes. This suggests the possibility of connecting the two theories (26). Moreover, the two theories can be integrated to explain the effects of potentially moderating variables, for instance *goal commitment*, which is determined by the

attractiveness of goal attainment (valence), and expectancy of goal attainment, moderates the relation between goal difficulty and task performance (21). According to Locke, et al, the factors that affect goal acceptance and goal choice fit easily into two major categories, which are the main components of expectancy theory: expectations of success (expectancy) and values (valence) (11). But a third category could be peer esteem/pressure which affects goal acceptance and goal choice.

Locke, after continuously refining and developing his theory, further says that goal-setting is really the underlying explanation for the other theories, including Vroom's expectancy theory, and these can be interpreted in terms of goal-setting theory (13).

T. Masui & A. Okada conducted a study on 63 undergraduate students to examine the connection of goal and expectancy theories. They predicted that the goal theory postulate (that harder goals lead to higher performance) would be substantiated only if the valence difference between the two goals (i.e. hard and easy) is substantially greater than their expectancy difference. The results showed that both performance and force (i.e. motivational) were significantly higher for the hard goal than for the easy goal. In addition, the force difference between the two goals was significantly

associated with performance difference, supporting the conclusion that expectancy theory can predict the goal theory postulate that harder goals lead to higher performance (26).

In their review of past empirical research on goal commitment and expectancy theory, J.R. Hollenbeck and H.J. Klein found four studies which showed the expected probability of obtaining a goal was positively related to goal commitment. In addition, three other studies found positive relations between valence, another major component of expectancy theory, and goal commitment (21). These findings indicate the possibility of integrating expectancy theory and goal-setting theory via goal commitment.

In summary, many laboratory and field goal-setting studies conducted under various circumstances have demonstrated the importance of specific hard goals to improve performance. Many of these studies also have shown the advantages of participation and feedback in the goal-setting process and their cognitive and motivational effects on performance. Therefore, participatory goal-setting with feedback combines the goal-setting theory with important moderators (participation and feedback) to enhance motivation and performance. Similarly, studies that combined goal-setting and expectancy theories have shown not only the connection and similarity of the two

theories but also the importance of such combination to explain the efffects of moderating variables such as goal commitment, goal acceptance and goal choice.

4.METHODS

4.1 Study Design

An intervention study was carried out in Ada, Adama, and Lome districts of East Shewa Zone over a period of three months, from October to December, 1993. The three months pre-intervention (July to September, 1993) and post-intervention (October to December, 1993) performances of selected primary health care (PHC) activities by the staff of selected health institution in the intervention and control groups were compared to assess the impact of the specific management interventions (all related to motivation).

A pretested questionnaire was self-administered twice, one just after the intervention and the other at the end of the study, to measure the motivational force score of 94 health workers in the two study groups (48 in the intervention and 46 in the control groups). All were shown how to fill in the questionnaire by six research assistants (two nurses and four health assistants) who were trained for one day about the questionnaire. The correlation of these scores with the performance of each variable was calculated to determine their association.

4.2 Study Population

A total of 12 health institutions in the three districts were included in the study: Six in the

intervention and six in the control groups. Health institutions in the intervention group were taken from Ada district due to the feasibility to apply the management interventions of the study in this district (see below). Health institutions in the control group were taken from Adama (Nazareth) and Lome (Mojo) districts (four and two health institution, respectively). Each study group comprised of one hospital, one health centre, and four health stations. The hospitals and health centres in both groups are under the same Zonal Health Department and the health stations are under three district health departments within the same zone. Due to the nature of the study it was not possible to randomly allocate the health institutions into intervention and control groups.

4.3 Operational Definitions

Goal: is defined as what an individual or group is trying to accomplish within a specified time limit (11).

i) Participative goals: refers to the goals set by involving the health workers working in the MCH/FP and EPI programs in the goal
setting process.

ii) Assigned goals: refers to the goals set by managers of health institutions to be implemented by the health workers.

Expectancy: is the probability of attaining the goal (23) for each variable, if maximum effort is exerted, as estimated by health workers.

Valence: refers to the desirability (attractiveness) of the goal (outcome) (23) to the health worker based on relative importance given to the goal by him.

Motivational Force Score (MFS): is the product of the expectancy score and the valence score (MFS = Expectancy X valence).

Performance: refers to the accomplishment of the task for the selected PHC activities.

Coverage: refers to the proportion of children or pregnant women who received a certain PHC service with respect to the target population of that service.

Health worker:- refers to physicians, nurses, and health assistants who were working in the selected PHC programs in the selected health facilities during the study period.

Catchment population:- is the estimated number of people that live with in 10 km of radius of a specified health institution.

Target population:- the target population for each variable was calculated based on the Ministry of Health (Eth.) percentage of the total population for each PHC activity. These are as follows:-

ANC = 5% of the total population

FP = 22% of the total population

GM = 18% of the total population

BCG = 4% of the total population

MEA = 4% of the total population

DPT-3 = 4% of the total population

TT-2 = 5% of the total population

4.4 Interventions

The following two management interventions were carried out in the health service facilities in the intervention group and those in the control group were allowed to have sessions on selected clinical topics rather than management sessions.

a) Participative goal-setting:- Health service facilities in the intervention group set their goals and developed strategies to attain them for various selected MCH/FP and EPI activities for three months (October to December, 1993) with participation of the staff of concerned sections and units. These goals and strategies were discussed with health workers working in maternal and child health, family planning (MCH/FP), and expanded program of immunization (EPI) programs. The goals and strategies were further developed, modified, or changed based on these discussions. Each goal and strategy was uniformly developed after reviewing the performance of each PHC activity in the previous three months (July to

September, 1993) and the annual plan of action on MCH/FP and EPI programs.

b) Feedback:- A one day feedback session was conducted monthly in each health facility in the intervention group during the intervention period (i.e. two were carried out) by their respective managers. During these sessions health workers were briefed about the past month's performance of each PHC activity, strengths and weaknesses observed, and depending on the level of performance, recognition or constructive criticism was provided. Furthermore, in these sessions the health workers were encouraged to suggest ways and mechanisms to improve the level of performance in the coming month.

To avoid or at least minimize the potential effects of the study itself on the performance of the health workers, the above specific management interventions were carried out by the manger and the staff of each health facility themselves as part of implementing PHC services, and health workers in both study groups were made unaware of the study, except the district health department managers.

4.5 Measurement

a) Seven variables from MCH/FP and EPI programs were selected to measure the performance of each health facility. These are:- i) Antenatal care (ANC) first

visits: number of pregnant women who had their first visit in the specified period.

ii) Family planning (FP) new acceptors: number of women in child bearing age (15 to 49 years) who were new acceptors of contraceptive methods in the specified period.

iii) Growth monitoring (GM) of children under five years of age who had their first visit in the specified period.

iv)BCG vaccination of children under one year of age in the specified period.

v) Measles (MEA) antigen vaccination of children under one year of age in the specified period.

vi) DPT-3 performance, i.e, number of children under one year of age who were vaccinated with diphtheria-pertussis-tetanus antigen for three times with an interval of at least four weeks between each dose.

vii) TT-2 and above coverage in pregnant women, i.e, number of pregnant women who were vaccinated twice or more with tetanus toxoid at interval of at least four weeks.

b) The motivational force score (MFS) for each variable was calculated as a product of the expectancy score and the valence score. The scores were graded as:-

i. Expectancy score - Low (prob. < 0.35) = score 1

Medium (prob. 0.35 - 0.70) = score 2

High (prob. > 0.70) = score 3.

ii. Valence score - Not important = score 1

Indifferent = score 2

Very important = score 3

Hence, MFS for each variable could have a minimum score of one and a maximum score of nine (Appendix 4).

4.6 Data Collection

Data on pre- and post-intervention performance of the selected variables in both groups were collected from monthly reports at the health facilities. These were then counterchecked with appropriate cards, record books, and tally sheets to ensure their reliability. This was performed by 12 health assistants who were trained for one day about collecting the required data. Two supervisors (one per group) were trained to verify the data on performance from each health facility. This was done at the end of each month during the intervention period. Data on the catchment population of each health facility were obtained from the Zonal Health Department which in turn obtained them from the Zonal Planning Office of East Shewa Zone.

4.7 Data Analysis

Data entry was carried out via a visible screen

terminal into a disk file using a data entry program. Data analysis was done using SAS program (27). The following statistical tests were used:-

a) Paired t-test (within group) to compare the change in pre- and post-intervention performance of each variable in the intervention and control groups. The change in performance was expressed in terms of percent change in coverage for each variable using the formula:

$$\frac{\text{postintervention performance - preintervention performance}}{\text{Target population for six months (study period)}} \times 100$$

b) T-test and non parametric tests to compare the change in performance for each variable and the overall change in performance between the intervention and control groups.

c) Coefficient of correlation (Pearson's coefficient of correlation) was calculated to determine the association between MFS and the change in performance of each variable, and the association between the level of goal and the change in performance for each variable in the study groups.

4.8 Ethical Considerations

This study was revised and approved by the Research and Ethical Committee of the Department of Community Health, Medical Faculty, AAU.

5. RESULTS

5.1 Comparability of the Intervention and Control Groups

Table 1 shows the comparability of the intervention and control groups with respect to some of the potential confounders. As shown in the table, except for the mean catchment population, the two study groups are fairly similar in other characteristics. Community participation, one of the potential confounding variables, was almost nonexistent in both study groups because the role of mass organizations and community health workers in health service activities was very minimal. Taking into consideration the difference in catchment population between the two groups, the pre-and post-intervention performance changes in both groups were taken as changes in coverage of each variable by dividing the performance of each health institution by the target population of its catchment area. The catchment population and target population of each variable in the health institutions are shown in Appendices 1 and 2, respectively.

Table 1: Comparability of the Intervention and Control Groups

Comparison variable	Intervention	Control
Mean catchment population	33719	38,336
Mean distance from supervising unit * (km)	12.5	12.3
Mean manpower in MCH/FP and EPI programs	7.8	8.3
Mean cash allocated in the study period (Birr)	997	1013.67
Number of functioning vehicles	2	2
Number of motorcycle	5	6
Availability of equipment, vaccine, Kerosine	Yes	Yes
All weather road	Yes	Yes
Community participation	Nil	Nil

* Mean distance from supervising unit refers the distance of the health institution from its immediate supervising unit.

5.2 Pre- and Post-intervention Performance of PHC Activities in the Study Groups

Tables 2 and 3 show the performance and the change in coverage of each variable by health institutions in the intervention and control groups respectively. The percent change in coverage for each variable in each health institution is calculated as:-

$$\frac{\text{Postintervention performance - preintervention performance}}{\text{Target population of the variable in the health institution}} \times 100$$

The data on target population of each variable (i.e,

denominator) are shown in Appendix 2.

As shown in Table 2, five out of six health institutions in the intervention group showed an increase in coverage in four variables; ANC, FP, Measles, and TT-2. For two variables, DPT-3 and GM, four health institutions and three health institutions, respectively, showed an increase in coverage. It was only for BCG that four health institutions showed a decrease in coverage. The maximum increase in coverage was 23% (for BCG) and the highest decrease in coverage was 4.6 % (for ANC).

Table 2: Pre- and Post-Intervention Performances and Changes in Coverage in the Intervention Group*

Variables		Deber-Zeit Health Centre	Debre-Zeit Hospital	Dukum Health Station	Bekejo Health Station	Menen Health Station	Chefe Donsa Health Station	Total
ANC	Pre	452	212	5	37	17	15	738
	Post	513	235	27	26	36	18	855
	%Change	2.26	0.85	6.16	-4.62	3.78	0.24	
FP	Pre	110	96	28	7	6	9	256
	Post	157	123	20	9	7	14	330
	%Change	0.4	0.23	-0.51	0.19	0.05	0.09	
GM	Pre	258	160	35	179	85	89	806
	Post	563	183	21	162	86	40	1055
	%Change	3.15	0.24	-1.09	-1.98	0.06	-1.08	
BCG	Pre	310	240	36	71	85	33	775
	Post	258	235	31	64	178	76	842
	%Change	-2.41	-0.23	-1.75	-3.68	23.08	4.25	
MEA	Pre	146	79	16	18	20	18	297
	Post	153	88	13	25	59	24	362
	%Change	0.33	0.42	-1.05	3.68	9.68	0.59	
DPT-3	Pre	199	155	21	17	13	9	414
	Post	218	129	15	49	60	20	491
	%Change	0.88	-1.21	-2.11	16.84	11.66	1.09	
TT-2	Pre	206	132	9	14	5	10	376
	Post	365	129	20	26	42	15	597
	%Change	5.9	-0.11	3.08	5.04	7.36	0.40	

* Target population (denominator) of each variable is shown in Appendix 2.

Table 3 Pre- and Post-Intervention Performances and Changes in Coverage in the Control Group.*

		Nazareth Health Centre	Haile-Mariam Mamo Hospital	Wonji Krftu Health Station	Awash Melkasa Health Station	Koka Health Station	Ejere Health Station	Total
ANC	Pre	496	315	14	21	35	7	888
	Post	527	256	62	50	37	29	961
	%Change	0.98	-1.86	3.83	6.65	0.43	5.12	
PP	Pre	195	38	58	62	18	16	387
	Post	189	56	51	39	24	29	388
	%Change	-0.04	0.13	-0.13	-1.20	0.30	0.69	
GM	Pre	754	439	85	226	92	75	1671
	Post	1045	702	80	235	50	105	2217
	%Change	2.55	2.31	-0.11	0.57	-2.53	1.94	
BCG	Pre	419	391	227	220	97	80	1434
	Post	299	570	109	162	53	112	1305
	%Change	-4.73	7.06	-11.75	-16.62	-11.92	9.30	
MEA	Pre	226	209	118	114	59	32	758
	Post	267	310	53	96	46	69	841
	%Change	1.62	3.98	-6.47	-5.16	-3.52	10.76	
DPT3	Pre	359	181	177	175	96	23	1011
	Post	370	281	136	175	68	65	1095
	% Change	0.43	3.95	-4.08	000	-7.59	12.21	
TT-2	Pre	429	372	19	213	35	4	1072
	Post	263	380	4	107	19	29	802
	% Change	-5.24	0.25	-1.20	-24.31	-3.47	5.81	

* Target population (denominator) of each variable is shown in appendix 2.

On the other hand, as shown in Table-3, in the control group five out of six health institutions showed an increase in coverage in only one variable (Antenatal care). For GM four out of six health institution showed an increase in coverage. For FP, Measles and DPT-3 three of them showed an increase in coverage while four

of them showed a decrease in coverage for BCG and TT-2 variables. The maximum increase in coverage was 12.2% (for DPT-3) and the highest decrease in coverage was 24.3% (for TT-2).

Table 4 shows the pre and post-intervention performance comparison in the intervention group. The mean change in coverage, except for GM which shows a decrease by 0.12%, in all variables shows an increase in coverage ranging from 0.07% to 4.53%. The paired t-test for each variables shows significant difference ($P<0.05$) only for TT-2. For the rest of variables the differences between the two periods were not statistically significant, but nonetheless several were quite substantial, especially for measles and DPT-3.

Table 4 Summary of % Changes in Coverage* between Pre and Post-Intervention Performance in the Intervention Group

HI	ANC	FP	GM	BCG	MEA	DPT-3	TT-2
HC	2.26	0.40	3.15	-2.41	0.33	0.88	5.9
Hosp.	0.85	0.23	0.24	-0.23	0.42	-1.21	-0.1
HS_1	6.16	-0.51	-1.09	-1.75	-1.05	-2.11	3.0
HS_2	-4.62	0.19	-1.98	-3.68	3.68	16.84	5.0
HS_3	3.78	0.05	0.06	23.08	9.68	11.66	7.3
HS_4	0.24	0.09	-1.08	4.25	0.59	1.09	0.4
Mean	1.45	0.07	-0.12	3.21	2.27	4.53	3.6
SD	3.66	0.31	1.80	10.12	3.95	7.79	3.0
t	0.968	0.579	-0.162	0.777	1.410	1.42	2.9
p	0.378	0.588	0.878	0.472	0.218	0.218	0.0

*See operational definition on page 24.
** $p < 0.05$
HI = health institution
HC = health center
Hosp. = hospital
HS = health station

When we observe the pre and post intervention period performance in the control group (Table 5), the mean change in coverage shows an increase in four variables ranging from 0.2%. to 2.52%. On the other hand three variables show a decrease in mean coverage ranging from 0.04% to 4.78%. The paired t-test for each variable is not statistically significant in all variables, though there is some substantial differences, especially in ANC, BCG and TT-2.

Table 5: Summary of % Changes in Coverage* between Pre and Post-Intervention Performance in the Control Group

HI	ANC	FP	GM	BCG	MEA	DPT-3	TT-2
HC	0.98	-0.04	2.55	-4.73	1.62	0.43	-5.24
Hosp.	-1.86	0.13	2.31	7.06	3.98	3.95	0.25
HS	3.83	-0.13	-0.11	-11.75	-6.47	-4.08	-1.20
HS	6.65	-1.20	0.57	-16.62	-5.16	000	-24.31
HS	0.43	0.30	-2.53	-11.92	-3.52	-7.59	-3.47
HS	5.12	0.69	1.94	9.30	10.76	12.21	5.81
Mean	2.52	-0.04	0.79	-4.78	0.20	0.82	-4.68
SD	3.21	0.64	1.93	10.76	6.56	6.86	10.33
t	1.93	-0.164	1.00	-1.09	0.075	0.293	-1.11
p	0.112	0.876	0.363	0.326	0.943	0.782	0.317

* See operational definition on page 24.

As shown in Table 6, the mean change in coverage is higher in the control group than in the intervention group in two variables, ANC and GM. The remaining five variables show higher mean value in the intervention group than in the control. Differences in mean coverage up to 8.3% are shown in these variables. Despite these differences, the statistical test for all variables is not significant. But the Wilcoxon Rank Sum 2-sample test for variable TT-2 shows a significant difference ($p < 0.05$) between the two study groups (Table 7).

Table 6: Comparison of Mean Changes in Coverage between Intervention and Control Groups for each Variable.

	Intervention (n = 6)		Control (n = 6)		Two-sample t-test		
Variable	Mean(%)	SD	Mean	SD	t	DF	p
ANC	1.45	3.66	2.52	3.21	-0.542	10	0.59
FP	0.07	0.31	-0.04	0.64	0.402	10	0.69
GM	-0.12	1.80	0.79	1.93	-0.842	10	0.42
BCG	3.21	10.12	-4.78	10.76	1.33	10	0.21
MEA	2.27	3.95	0.20	6.56	0.663	10	0.52
DPT-3	4.53	7.79	0.82	6.86	0.874	10	0.40
TT-2	3.61	3.03	-4.69	10.33	1.89	10	0.08

Table 7: Wilcoxon 2-Sample Test for Variable TT-2

Group	n	Sum of Scores	Expected Under HO	SD under HO	MeanScor
Intervention	6	52.0	39	6.24	8.67
Control	6	26.0	39	6.24	4.33
Z = 2.0					
p = 0.045					

Even though the difference in mean changes of coverage for each variable between the two study groups is not statistically significant, the performance change for all variables together between the intervention and control groups is statistically significant. The pre- and post-intervention change in coverage for all variables together shows significant

difference in the intervention group but not in the control group. These results are shown in Table 8. Table 8 also shows a reduction in overall performance by 0.74% in the control group but an increase by 2.15% in the intervention group.

Table 8. Comparison of the Overall Change in Coverage for the Variables between the Intervention and Control Groups

Obs (n)	Intervention	Control
ANC	1.45	2.52
FP	0.07	-0.04
GM	-0.12	0.79
BCG	3.21	-4.78
MEA	2.27	0.20
DPT-3	4.53	0.82
TT-2	3.61	-4.69
Mean	2.15	-0.74
SD	1.77	2.85
T_6	3.23	-0.688
P	< 0.05	>0.05
2 - Sample t - test		
t = 2.28 DF = 12 p < 0.05		

Table 9 shows the comparison of change in coverage for all variables classified by type of health facility (hospital, health centre, and health station) between the two study groups.

Table 9: Comparison of the Overall Change in Coverage for Variables by Type of Health Institution between the Study Groups

	Hospitals #2		Health Centres #2		Health Station#8	
Obs (n)	Intervention	Control	Intervention	Control	Intervention	Control
ANC	0.85	-1.86	2.26	0.98	1.39	4.01
FP	0.23	0.13	0.40	-0.04	-0.05	-0.09
GM	0.24	2.31	3.15	2.55	-1.02	-0.03
BCG	-0.23	7.06	-2.41	-4.73	5.47	-7.75
MEA	0.42	3.98	0.33	1.62	3.23	-1.10
DPT-3	-1.21	3.95	0.88	0.43	6.87	0.13
TT-2	-0.11	0.25	5.90	-5.24	3.97	-5.79
MEAN	0.03	2.26	1.50	-0.63	2.84	-1.52
SD	0.65	3.01	2.61	3.09	2.89	3.97
T_6	0.11	1.98	1.52	-0.54	2.61	-1.01
P	NS**	NS	NS	NS	< 0.05	NS
	2 Sample t-test		2-Sample t-test		2- Sample t-tes	
t	-1.92		1.39		2.35	
DF	12		12		12	
p	NS**		NS		< 0.05	

* # = Number
** NS = Not Significant

The health centre and health stations in the control group have negative mean value for the selected PHC activities. On the other hand, the mean change in coverage in the control hospital is higher than that of the hospital in the intervention group. The paired t-test for health stations in the intervention group shows significant difference ($p < 0.05$) between pre and post-intervention performances. Similarly, a significant difference ($P < 0.05$) is shown when the mean performance

change between health stations in the intervention and control groups is compared. Even though there is a 2.13% difference in mean change of coverage between the health centres in the two study groups, there is no statistically significant difference between their performance.

5.3 Correlation of Motivational Force Score (MFS) and Performance

The result of the first MFS (MFS-1) and the second MFS (MFS-2), which were measured just after the first intervention and at the end of the study respectively, as well as the difference between the two measurements together with the statistical test for each variable in the study groups is shown in Table 10. Comparison of both the first and second MFS measurement between the intervention and control groups shows significant difference, $p < 0.05$ and $p < 0.001$ respectively. But the difference between the two measurement (MFS-2 - MFS-1) in both study groups is not found to be statistically significant. Since the maximum score for each variable is nine, the MFS given for each variable as well as the mean score for all the variables in both study groups is quite high, despite the significant difference between them.

Table 10: Motivational Force Score (MFS) for each Variable Compared between Study Groups

Variable	First measurement (MFS-1)		Second Measurement (MFS-2)		d (MFS-2 - MFS-1)	
	Intervention	Control	Intervention	control	intervention	control
ANC	7.90	6.16	7.48	6.03	-0.42	-0.13
FP	8.06	6.39	8.15	6.50	0.09	0.11
GM	5.69	5.55	6.92	6.05	1.23	0.50
BCG	7.33	6.76	7.13	6.45	-0.20	-0.31
MEA	5.98	5.74	6.40	5.92	0.42	0.18
DPT-3	6.54	5.74	7.06	5.97	0.52	0.23
TT-2	7.02	5.24	6.92	5.68	-0.10	0.44
MEAN	6.93	5.94	7.15	6.09	0.22	0.15
SD	0.91087	0.52367	0.54554	0.29274	0.55609	0.29022
t_{12}	2.49		$t_{12}=4.53$		$t_6=1.05$	$t_6=1.37$
p	<0.05		p<0.001		p>0.05	p>0.05

Tables 11 and 12 show the correlation of MFS-1 and MFS-2 of each variable with the mean change in coverage of each variable respectively. As shown neither MFS-1 nor MFS-2 are significantly correlated with the mean change in coverage. Surprisingly, the r value in both measurement in the two study groups is negative, though the magnitude is too small to indicate an inverse relationship between MFS and performance. The negative correlation between MFS-2 and mean change in coverage in the intervention group (r = -0.422) almost disappears (r = -0.011) when the correlation is done without the extreme value for FP.

Table 11: Correlation of the First Motivational Force Score (MFS1) with the Mean Change in Coverage for each Variable in the Study Groups

	INTERVENTION		CONTROL	
VARIABLE	MFS1	MEAN CHANGE COVERAGE	MFS1	MEAN CHANG IN COVERAG
ANC	7.90	1.45	6.16	2.52
FP	8.06	0.07	6.39	-0.04
GM	5.69	-0.12	5.55	0.79
BCG	7.33	3.21	6.76	-4.78
MEA	5.98	2.27	5.74	0.20
DPT-3	6.54	4.53	5.74	0.82
TT-2	7.02	3.61	5.24	-4.69
	r = -0.073		r = -0.068	
	p = NS		p = NS	

Table 12 : Correlation of the Second Motivational Force Score (MFS2) with the Mean Change in Coverage for each Variable in the Study Groups

	INTERVENTION		CONTROL	
Variable	MFS2	Mean Change in Coverage	MFS2	Mean Chang in coverag
ANC	7.48	1.45	6.03	2.52
FP	8.15	0.07	6.50	-0.04
GM	6.92	-0.12	6.05	0.79
BCG	7.13	3.21	6.45	-4.78
MEA	6.40	2.27	5.92	0.20
DPT-3	7.06	4.53	5.97	0.82
TT-2	6.92	3.61	5.68	-4.69
	r = -0.422		r = -0.031	
	p = NS		p = NS	

5.4 Correlation of Participative and Assigned Goal Levels with Performance of the Study Groups

Table 13 shows the level of participative and assigned goal for each variable in the intervention and control groups respectively. Each goal level (shown as a percentage) is calculated by dividing the goal for the variable by the target population of the variable expected in the three month period (i.e, a quarter of the annual target population for the variable). The mean goal level for each variable is shown on the last row for each study group.

Table 13 Participative and Assigned Goal Levels for Variables in the Intervention and Control Groups.

		ANC		FP		GM		BCG		MEA		DPT-3		TT-2	
	HI	Goal	%	Goal	%	Goal	%	Goal	%	Goal	%	Goal	%	Goal	%
INTERVENTION	1	731	54.3	321	5.4	807	16.6	585	54.3	585	54.3	585	54.3	731	54.3
	2	300	22.3	150	2.5	200	4.1	300	27.8	300	27.8	300	27.8	250	18.6
	3	30	16.8	25	3.2	90	14.0	90	63.2	90	63.2	90	63.2	30	16.8
	4	25	21.0	12	2.3	175	40.8	67	70.5	67	70.5	67	70.5	25	21.0
	5	93	37.0	50	4.5	213	23.5	113	56.1	113	56.1	113	56.1	75	29.8
	6	97	15.3	31	1.1	112	4.9	175	34.6	75	14.8	60	11.9	100	15.8
		Mean %	27.8		3.2		17.3		51.1		47.8		47.3		26.1
CONTROL	1	639	40.3	349	5.0	1711	30	545	43.0	380	30.0	507	40.0	365	23.0
	2	491	31.0	139	2.0	856	15.0	665	52.5	494	39.0	761	60.0	491	31.0
	3	94	15.0	86	3.1	271	12.0	147	29.3	75	14.9	100	19.9	94	15.0
	4	44	20.2	37	3.9	275	35.0	150	86.0	140	80.2	140	80.2	44	20.2
	5	60	26.0	30	3.0	130	15.7	123	66.7	92	49.9	92	49.9	66	28.6
	6	25	11.6	13	1.4	135	17.6	125	72.7	88	51.2	38	22.1	11	5.1
		Mean %	24.0		3.1		20.9		58.4		44.2		45.4		20.5

*HI = Health institution (1 = HC, 2 = Hosp, 3 to 6 = HS)
**% = Percent of target population
Intervention = Participative goal levels
Control = Assigned goal levels

The participatively set goal levels in the intervention group and the assigned goal levels in the control group for the variables are compared in Table 14. As shown in the table there is only a mean difference of 0.6% between the participative goal levels and assigned goal levels and this is not statistically significant.

Table 14: Comparison of Participative and Assigned Goal levels for Variables in the Intervention and Control Groups

	GOAL LEVEL FOR VARIABLES AS % TARGET POPULATION							
	ANC	FP	GM	BCG	MEA	DPT-3	TT-2	MEAN
Intervention	27.8	3.2	17.3	51.1	47.8	47.3	26.1	31.5
Control	24.0	3.1	20.9	58.4	44.2	45.4	20.5	30.9
								t = 0.0
								DF = 12
								p = NS

Table 15 shows the correlation of the participatively set goal levels in the intervention group with the mean change in coverage of the variables. This association, with coefficient of correlation, $r = 0.762$, is found to be statistically significant ($P<0.05$). On the other hand, no such correlation is seen between the assigned goal levels in the control group and the mean change in coverage of variables.

Table 15: Correlation of Participative ad Assigned Goal Levels with the Mean Change in Coverage for Variables in the Study Groups

	INTERVENTION		CONTROL	
	X Goal Level (%)	Y Mean Change in Coverage	X Goal Level (%)	Y MeanChang inCoverag
ANC	27.8	1.45	24.0	2.52
FP	3.2	0.07	3.1	-0.04
GM	17.3	-0.12	20.9	0.79
BCG	51.1	3.21	58.4	-4.78
MEA	47.8	2.27	44.2	0.20
DPT-3	47.3	4.53	45.4	0.82
TT-2	26.1	3.61	20.5	-4.69
	r = 0.762 t = 2.63 DF = 5 p < 0.05 95% CI = 0.642 to 0.882		r = -0.283 t = -0.66 DF = 5 p = NS 95% CI = -0.631 to0.06	

6. DISCUSSION

This study has tried to show the impact of two specific management interventions, participatory goal setting and feedback, on the performance of selected PHC activities and the staff of health service facilities in the intervention group. It also tried to measure MFS given for each selected variable by health workers in each study group and show the difference in MFS between the two groups. The relationship between MFS and mean change in coverage as well as the relationship between goal level and mean change in coverage for variables were examined in the previous section.

6.1 Change in Coverage for Variables

When the pre- and post-intervention period performance of each variable were compared significant change in coverage was obtained for one variable (TT-2) in the intervention group and none in the control group. Similarly, when the mean changes in coverage for each variable between the two study groups was compared significant difference was obtained only for TT-2. Even though the other differences were not statistically significant, the intervention group showed higher mean coverage in four other variables (FP, BCG, Measles, DPT-3) and differences in mean coverage up to 8.0% being observed. On the other hand, the control group showed

higher mean coverage in two of the seven variables (ANC and GM) with differences in mean coverage of not more than 1.1% being observed.

Comparison of the mean changes in performance for all variables between the intervention and control groups showed a difference in mean coverage of 2.9% which was statistically significant ($p < 0.05$). When similar comparison was done by type of health institution (i.e. hospital, health centre, health station), significant difference in mean coverage ($p < 0.05$) was obtained between health stations in the intervention and control groups. No significant differences were shown between the hospitals and health centres in the two study groups. In fact, the hospital in the control group performed better than the hospital in the intervention group. This finding of the study is probably due to more emphasis on the above mentioned PHC activities in health stations than in hospitals or health centres which focus more on curative health services.

The above findings of the study concerning performance suggest the potential usefulness of participative goal-setting and feedback in PHC activities. But one cannot expect differences in coverage of considerable magnitude from this study because the study didn't control, even assess, the health seeking behaviour of the people which is a likely

determinant, along with other potential confounders (eg. community participation, intersectoral coordination, organizational design of health services, quality of the health services), of coverage rate of health services.

The study also has shown the importance of participative goal-setting and feedback in generating ideas and developing strategies to attain the goals (Appendix 3) Similar findings were obtained by other researchers in field experiments (19,20). It is quite logical to anticipate better performance level in subsequent participative goal-setting and feedback exercises than in the initial implementation of these management interventions. This is because the management and staff will gain experience in the participative goal-setting and feedback processes and improve their skill in developing more challenging but attainable goals and strategies to attain them. They also learn to become more participative, since participation requires learning (28).

6.2 Correlation of Goal Level and Change in Mean Coverage

The fact that harder and specific goals lead to better performance than easy and vague goals had been shown in many goal-setting researches (11). Although it is technically difficult to differentiate goals as hard and easy in health service activities, this study has

shown a positive correlation (r = 0.76) between the participatively set goal levels (which were generally higher) and change in mean coverage in the intervention group. No similar significant correlation was obtained between the assigned goal levels and change in mean coverage in the control group. Besides this agreement with the basic postulate of goal theory about goal difficulty and specificity (8), this finding in the intervention group suggests the importance of participation in setting relatively more challenging and realistic goals than the assigned goal levels. This may imply that the assigned goal levels for each variable in the control group were likely too easy to attain, which leads to lower performance.

Unlike the theoretical importance of participation in setting higher goal levels described in goal-setting theory (8), participation in this study did not lead to setting significantly higher goal levels than the assigned goal setting condition. This could be, as mentioned above, due to difficulty in distinguishing easy goals from hard goals or challenging but attainable goals from too difficult and unrealistic ones in health service activities. On the other hand, this finding may indicate that the cognitive effects of participation (i.e. increased task understanding, generating new ideas, and developing strategies) were relatively more profound than

its motivational effect (setting of higher goals). This study indirectly assessed the other aspect of motivational effect of participation - increased goal acceptance or commitment by measuring the motivational force score assigned to each variable by the health workers in the two study groups.

6.3 Motivational Force Scores in the Two Study Groups and their Relationship with Performance

A statistically significant difference in the MFS for the selected PHC variables was obtained between the intervention and control groups. A higher MFS in the intervention group than in the control group means higher expectancy or valence, or both, with respect to the goal set for each variable. This indirectly reflects higher goal acceptance or commitment in the intervention group than in the control group. This result was expected because participatively set goals lead to higher goal acceptance or commitment than assigned goals (11).

Unlike the prediction and theoretical perspective MFS was not correlated with performance of the selected variables in the study. Three points can be said about this finding. First, even though there was a significant MFS difference between the intervention and control groups, both groups had high MFS for the variables, therefore, absence of correlation between MFS and performance possibly indicates that low expectancy

and/or valence is not the main reason for decreased performance of the selected PHC activities. Second, the absence of a statistically significant correlation between MFS and performance suggests the presence of factors beyond the scope of this study which determine (or at least affect) the rate of performance. Community participation, health seeking behaviour of the people, intersectoral coordination, organization design, and quality of health care are possible examples of such factors. This points to the need of exploring such moderating variables in future management related research. Third, this finding may imply that motivation cannot solely be measured by expectancy and valence scores alone (taking also into consideration the difficulty of the scoring method). Therefore, factors like the presence of incentives (both material and non-material) and supportive management should be considered when determining the level of motivation.

6.4 Limitations and Strengths of the Study

Finally, some limitations of the study can be enumerated, among these the following appear to be more prominent. First, , it was not possible to randomly allocate health institutions into intervention and control health institutions which raises the issue of selection bias. This was because of technical difficulty

to administer uniformly the management interventions in the control health institutions. Second, the number of health institution included in the study was small. Lack of similar studies in the health sector and the short study period and monetary constraints limited the number of health institutions in the study. Third, as health service activities are complex in nature, there remain many social cultural, and behavioural potential confounders that may affect health coverage which need to be explored. Fourth, the scoring method used to measure expectancy and valence may not exactly reflect the motivational status of the health workers with respect to each PHC activity.

On the other hand , this study was conducted in comparable study groups with respect to important confounders and the difference in catchment population was controlled. Care had been taken to ensure the reliability of the data. The study also avoided the potential effects of the study itself on the performance of health workers by making them unaware of the study. These strengths make the results of the study valid.

7. CONCLUSIONS

Inspite of the limitations of this study mentioned in Section 6.4 and the preliminary nature of the study, the following conclusions can be drawn:

1. Although the difference in mean change of coverage for each variable between the study groups was not considerable, the overall findings of the study concerning performance are suggestive of the potential usefulness of participative goal-setting and feedback to enhance performance.

2. Participative goal-setting with feedback appears to be useful for both cognitive (task understanding, generating ideas, and developing strategies) and motivational (setting relatively more realistic and higher goals increased goal acceptance and commitment) reasons in the development of PHC service activities.

3. The positive correlation of goal level with mean change in coverage for the participatively set goal levels in the intervention group, but not for the assigned goal levels is suggestive of the importance of the former in setting more challenging and realistic goals than the latter.

4. Based on the relatively high MFS given for the selected PHC activities by health workers in both study groups, low expectancy or valence for PHC activities does not seem to be the main reason for the low service

coverage of PHC activities. On the other hand, significantly higher MFS in the intervention group than in the control group indicates the importance of participation for goal acceptance and commitment.

8. RECOMMENDATIONS

Based on the results of the study and the conclusions drawn from them, the following two recommendations are forwarded:

1) Managers at all levels of the health care delivery system will be able to improve the motivation of employees and performance of PHC services if they use participative goal setting and regular feedback as part of their duties.

2) Similar management related studies to explore factors related to motivation and performance of health workers should be conducted in order to enhance the health service coverage.

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APPENDIX 1: Catchment Population of Health Institutions in the Study Groups

INTERVENTION GROUP		CONTROL GROUP	
HEALTH INSTITUTION	CATH. POP	HEALTH INSTITUTION	CATCH POI
1 Debre-Zeit Health Centre	107,766*	7. Nazareth Health Centre	126,743*
2. Debre-Zeit Hospital	107,766*	8. Haile Mariam Mamo Hospital	126,743*
3. Dukum Health Station	14,271	9. Wonji Kurftu Health Station	50,191
4. Bekejo Health Station	9,524	10. Awash Melkasa Health Station	17,450
5. Menen Health Station	20,132	11. Koka Health Station	18,440
6. Chefe-Donsa Health Station	50,623	12. Ejere Health Station	17,192
TOTAL	202,316	TOTAL	230,016

* Two health institutions with one catchment population.

Appendix 2: Estimated Target Population for Each Variable in the Study Period (six months) in the Study Groups

No	ANC	FP	GM	BCG	MEA	DPT-3	TT-2
1	2694	11854	9699	2155	2155	2155	2694
2	2694	11854	9699	2155	2155	2155	2694
3	357	1570	1284	285	285	285	357
4	238	1048	857	190	190	190	238
5	503	2215	1812	403	403	403	503
6	1266	5569	4556	1012	1012	1012	1266
7	3169	13942	11407	2535	2535	2535	3169
8	3169	13942	11407	2535	2535	2535	3169
9	1255	5521	4517	1004	1004	1004	1255
10	436	1920	1571	349	349	349	436
11	461	2028	1660	369	369	369	461
12	430	1891	1547	344	344	344	430

Appendix 3: Strategy Development to Attain the Participatively Set Goals in the Intervention Group

Along with participatively setting goals for the variables, the staff in the intervention health institutions also developed strategies to attain the goal for each variable. The following list of strategies were developed by the staff of these health facilities. The number of health institutions is shown in brackets.

1. Strengthening health education about PHC Services (6)
2. Division of labour among the staff for screening and providing health care services in MCH/FP and EPI programs (3)
3. Minimizing defaulters by providing on-site health education, properly telling the next visit (appointment), and explaining possible minor side effects of some vaccines (4)
4. Providing TT vaccination in schools (2).
5. Strengthening the out-reach vaccination program (4).

APPENDIX 4: QUESTIONNAIRE TO MEASURE MFS

1. Identification.

1.1 Qualification (cross one) a) physician b) Nurse c)health assistant

1.2 Sex (cross one) a) male b) Female

1.3 Age.....

1.4 Years of service .....

1.5 Place of work.....

2. Does your health institution have specific goals on MCH/FP and EPI programs for the coming 3 months? a) yes b) no

If no stop filling the questionnaire here.

If yes fill the questionnaire below.

If you try your best to implement the goal for each of the programs, what is the likelihood (probability) of attaining the goal?

	LIKELIHOOD(PROBABILITY)		
	Low (<35%	Medium (35-70%)	High (>70)
2.1 BCG coverage of <1 children			
2.2 Measles			
2.3 DPT-3			
2.4 TT-2 in pregnant women			
2.5 ANC			
2.6 FP planning coverage			
2.7 GM of< 5 children			

3. If you are able to accomplish the goal for each of the programs (i.e 100% success), how important or essential is the result |(outcome) in your judgement? try to analyze each outcome in terms of its relative importance in preventing disease and promoting |health. check only one box for each program.

	Not important	Indifferent	V.Importan
3.1 BCG Coverage of <1 children			
3.2 Measles coverag of <children			
3.3 DPT-3 Coverage <1 children			
3.4 TT-2 coverage o pregnant women			
3.5 ANC coverage			
3.6 FP coverage			
3.7 GM of <5 childr			

DECLARATION

I, the undersigned, declare that this thesis is my work and that all resources of material used for this thesis have been duly acknowledged.

Name. ASNAKE WORKU PESTA.....

Signature..Asnake Worku.....

Place..Addis Ababa.....

Date of Submission.21/07/84.....

This thesis has been submitted for examination with my approval as University Advisor.

Dr David Zakus.....
Advisor