

INVITED PAPER

What is a planning model? An introduction to PRECEDE-PROCEED

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Abstract

Planning models exist at a macroscopic level; they serve as an organizing framework for an entire health promotion effort aimed at fostering reduction in a given disease. A particularly useful, widely applied, and easy-to-follow example of a planning model is the PRECEDE-PROCEED planning model (PPM). The PPM is very much an ecological approach to health promotion. The PPM is actually quite simple to understand once one realizes that it embodies two key aspects of intervention: a) planning, and (b) evaluation. The PPM guides the program planner to think logically about the desired end point and work “backwards” to achieve that goal. Through community participation, the planning process is broken down into objectives, step 3 sub-objectives, and step 4 sub-objectives. Conceptually, this approach to health promotion provides context to the use of theory, with theory being applied at the fourth step. This observation teaches a vital lesson, namely that program planning is larger and is a more comprehensive task compared to the subservient function of theory selection and application.

Introduction

At its core, a theory is a set of testable propositions that help us to explain and predict phenomena, such as health behaviors (1). Theory is dynamic rather than static, as empirical testing of theories over time should lead to changes, refinements, and improvements to a theory that increase our ability to understand a given phenomenon (2). Thus, a public health practitioner who clings to a static theory is much like a physician who clings to an old treatment despite innovations in medicine. A theory is and always should be in a state of evolution.

Ultimately, theories are used in attempts to change the phenomena that they help us to understand, as it is widely believed that theory-based interventions are more successful than those that are not based on theory. There is also empirical support for this proposition, as reviews have shown theory-based interventions to be superior to those that are atheoretical (3,4). While theories continue to be tested and debated in the research literature, practitioners can view theory in a utilitarian light: a theory is a tool that allows one to

inform and strengthen practical solutions to old and emerging problems in public health.

A planning model is much different than a theory. Planning models exist at a macroscopic level; they serve as an organizing framework for an entire health promotion effort aimed at fostering reduction in a given disease. Unlike theories, planning models are *not* made up of a set of testable propositions. Rather, planning models serve as a blueprint for building and improving intervention programs. Planning models, then, are much broader than theories, and they, in fact, are inclusive of theories. In particular, they instruct the practitioner about which theory (or theories) should be used and when and how they should be applied. However, this is only one of the many functions served by planning models.

As a metaphor, we might think of a planning model as a general blueprint for something we are trying to build (in this case, a health promotion program). This blueprint (planning model) is essentially a roadmap for how we go about building the program. While it does not contain all of the specific details within it (e.g., the specific program elements), the blueprint does provide a very useful step-by-step guide for

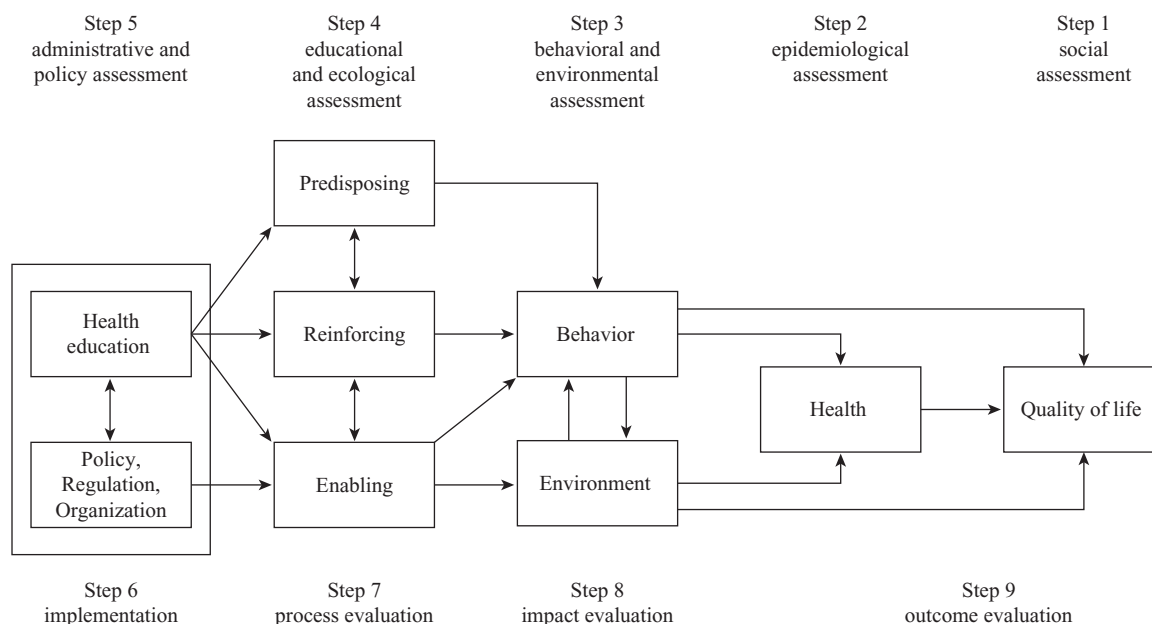


Figure 1 Visual Depiction of the Precede-Proceed Planning Model. Source: Green and Kreuter, 1999, p. 34.

constructing (and evaluating) the program. Where theory comes in is as follows: Theory is an essential part of that blueprint, one that is necessary for building a successful program. While our blueprint (planning model) does *not* specify the exact theory that we should use in the program, it *does* specify basic guidelines that will guide us through the process of making these key decisions, including choosing an appropriate theory for the program.

A particularly useful, widely applied, and easy-to-follow example of a planning model is the PRECEDE-PROCEED planning model (PPM) (5). PRECEDE stands for **P**redisposing, **R**einforcing, and **E**nabling **C**onstructs in **E**ducational/environmental **D**iagnosis and **E**valuation. Generally speaking the PRECEDE phases correspond with steps 1 through 4 of the model as depicted in Figure 1. PROCEED, on the other hand, stands for **P**olicy, **R**egulatory, and **O**rganizational **C**onstructs in **E**ducational and **E**nvironmental **D**evelopment. This aspect of the model begins with step 5 of the model depicted in Figure 1.

The PPM is very much an ecological approach to health promotion. Thus, understanding the model shown in Figure 1 will be significantly aided by a simple explanation of what constitutes a true ecological approach to health promotion. In a nutshell, an ecological approach means that all aspects of a person's environment are considered as potential intervention targets, as well as the person's own cognitions, skills, and behavior. Thus, ecological approaches are somewhat of a misnomer, only because the term suggests a strict focus on the environment. In many cases, a strict focus on the

individual may be the key to health promotion. This, for example, may be the case when it comes to promoting improved dental hygiene in some populations residing in the United States (but certainly not all of them).

This last caveat above (i.e., not all of them) is critical to consider. For example, part of good dental hygiene is periodic removal of calculus by a trained hygienist. If this service is costly, there will be large numbers of people who simply would not be able to afford the care. Thus, for this aspect of dental hygiene, an individual-level approach that does not consider the broader structural and environmental influences on this behavior would likely be futile. While teaching individuals how and motivating individuals to brush and floss is vital to improved dental hygiene, policy change may be required to enable people access to periodic cleaning. Once periodic cleaning is accessible and affordable, then teaching and motivating reenters the equation, only because the "choice" is one that we should intervene upon through persuasion.

This brief vignette only partially illustrates the eloquence of an ecological approach. Return for a moment to the concept of teaching and imagine addressing the concept of preventing caries via reduced intake of soft drinks. That constant daily bathing of the teeth in high sucrose beverages is clearly a problem from the vantage point of the dental professional, but society says otherwise. Because perception dictates personal realities, people may well view society as valuing these beverages. This positive valuation is clearly a product of advertising (e.g., "Obey your thirst," "Do the Dew," and "It's

the real thing”). “The Pepsi generation” really is a generation – these people grew up being exposed to multibillion dollar advertising campaigns that had a clear goal – switch the preferred drink from milk to soda. This new norm is not going to change anytime soon, and yet, it must be dealt with in efforts to promote dental hygiene. Thus, what may seem at first blush as an individual-level problem is really a social problem that may not be retractable. An ecological approach acknowledges these “higher-order” influences on health behavior and seeks to address those factors that can be changed or mitigated at the community level.

Armed with an understanding of what an ecological approach entails, it is now also important to understand that intervention efforts require constant maintenance and updating. This is precisely why evaluation is so critical. Program evaluation provides “built-in” mechanisms for feedback to the program planners to make judgments about what is working and what requires refinement. Again, being quite distinct from theory per se, evaluation is a macro-function of planning models. Finally, the value of planning models will be far more apparent given an understanding of a basic maxim in health promotion: “Begin where the people are and help them move forward.” In essence, this means that understanding the target audience is a necessary first step in any health promotion endeavor. It is not a luxury or an extra step – it is necessary to the point that nothing can or should occur until this part of the planning process is complete. Taken down to a simple concept, the maxim implies that all programs should be developed through extensive involvement of community members – sometimes even to the extent of engaging these folks in the planning process, including evaluation.

The PPM is a framework that, when used properly, guides the user to engage the target community to develop a sound ecologically based approach to the problem at hand. This framework provides guidance for the selection and use of theory, if needed, and it creates built-in evaluation mechanisms. With these basic functions in mind, it is relatively easy to see how PPM works. To be absolutely clear, note that using the PPM implies the use of an ecological approach to health promotion and that the PPM may or may not lead the program planner to employ theory. In other words, theory application is not mandatory to the PPM; however, it is quite likely that better programs will indeed be drawing upon one or more theories as the PPM-guided process unfolds.

The PPM

The PPM is actually quite simple to understand once one realizes that it embodies two key aspects of intervention: (a) planning, and (b) evaluation. The planning steps are shown across the top of Figure 1 (steps 1 through 5). The evaluation steps are shown across the bottom of the figure (steps 6 through 9). Planning begins with the largest goal (improved

quality of life) and culminates in an administrative and policy assessment. The arrows in Figure 1 illustrate the logic model within the PPM. In essence, the arrows show causal pathways between the steps. The evaluation portion of the PPM is shown across the bottom, beginning at step 5 and continuing through step 9.

Social diagnosis (step 1)

This nine-step logic model is one that frequently puzzles people when they first look at the arrows. The arrows point from left to right, yet the steps are numbered from right to left. This is actually a key point of the planning model. This layout necessitates that you plan “backwards” – working from the end goal to produce objectives and sub-objectives that, if met, will culminate in the realization of that goal. The goal is improved quality of life as defined by the community. Of course, a community may have multiple issues that impinge on quality of life, so, it is often the case that the program planner must begin by “pre-identifying” a health issue that is believed to have a substantial impact on quality of life in the community. Clearly, in many communities, improved oral health is an example of a key issue. Nonetheless, the astute planner will spend an abundance of time understanding all possible dimensions of this health issue. Key investigation questions might include: how much community members value their teeth; what the culture is like in terms of oral hygiene and diet; whether dental professionals tend to be trusted or not; and what key barriers exist that keep individuals from protecting their oral health (see Table 1). Answering these and a host of other questions are vital tasks in the process of making a thorough social diagnosis. Other social diagnostic information can be gleaned from numerous sources. A few examples include finding the median household income, learning what percent of the community has dental insurance, finding out how many people in the community are already compromised in their oral health, and determining how many dental providers exist for every 1,000 community residents.

Once the social diagnosis is well underway, it is wise to form a community advisory board (CAB). A 10-member CAB, for example, may be a good way to begin finding out more about the community and what, who, and how the change efforts might look like in an ideal scenario. Cultivating the attention and ongoing input from these individuals is the basis of a key PPM principle – community participation. From this point forward, the CAB becomes an integral part of the entire planning and evaluation process. Thus, maintenance of the CAB is a key task.

Epidemiological diagnosis (step 2)

The goal of this step is to create measurable health-related objectives. In essence, these objectives become the standards

Table 1 Steps in PRECEDE-PROCEED and Examples at Each Step

Steps	Tasks	Examples
Step 1: Social diagnosis	Ask and answer key questions related to the health issue	• How much do people value their teeth, including superficial aspects (e.g., whiteness) as well as health aspects (e.g., cavities)? • What is the culture like in terms of diet, oral hygiene, attitudes toward dental care, beliefs about preventing oral health issues, etc.? • Are dental professionals trusted? Why or why not? • What are the key barriers that keep people from protecting their oral health and what are predominant risk factors? • Who are the likely community leaders whom you might work with to leverage initial change efforts? • What proportion of the community has dental insurance? • How many dental providers exist per 1,000 residents? • How can a community advisory board (CAB) be developed and maintained to help improve this health area?
Step 2: Epidemiological diagnosis	Create measurable, time-limited, health-related objectives. The success of the program will ultimately be judged by these objectives	By the year 2015, the number of people living in the community who have been diagnosed with periodontal disease will be reduced by 30%.
Step 3: Behavioral and environmental diagnosis	Identify key environmental and behavioral factors; these will become sub-objectives that direct planning for intervention activities	<i>Environment</i> • Reduce the number of billboards, posters, and local media advertisements that promote the use of smokeless tobacco, by 50%, within 6 months. • Within 6 months, provide no-cost supplies of floss to at least 75% of all local drug stores, hair salons, banks, and other commonly visited public venues. • Within 6 months, provide “safety nets” for uninsured people and help those who are insured pay for out-of-pocket costs associated with dental visitation. <i>Behavior</i> • The prevalence of flossing among community residents of all ages will double within 12 months. • -Consumption of high-sucrose beverages will decrease by 30% within 9 months. • -Consumption of smokeless tobacco products will decrease by 50% within 12 months.
Step 4: Educational and ecological diagnosis	Develop a unique plan to achieve each sub-objective from step 3; Consider predisposing, reinforcing, and enabling factors, and use theory	<i>Environment</i> • Build a coalition of concerned citizens to lobby the local government to put restrictions on the number of allowable billboards, posters, and local media advertisements that promote the use of smokeless tobacco. • Distribute supplies of floss to at least 75% of all local drug stores, hair salons, banks, and other commonly visited public venues. • Provide free access to dental care for persons earning less than \$20,000 per year and assist those in this income bracket with out-of-pocket expenses associated with care (enabling factors). <i>Behavior</i> • Develop and implement a “healthy mouth, healthy body” social marketing campaign focusing on flossing, drinking non-sugary beverages, and eliminating use of tobacco products. • Use Social Cognitive Theory as a basis for the social marketing effort; focus messages on increasing positive outcome expectations of these behaviors, reducing negative outcome expectations of the behaviors, and building self-efficacy to engage in these behaviors (predisposing factors).
Step 5: Administrative and policy assessment	Assess capacity and resources available to implement programs and change policies such that step 4 sub-objectives can be met	<i>Policy, regulation, organizational structures</i> • Assess capacity and marshal resources and support for lobbying to local government, distribution of floss, and dental care among low income individuals. <i>Health behavior</i> • Assess capacity and marshal resources for social marketing effort
Step 6: Implementation	Draft and finalize program evaluation plan before program implementation	Detail implementation plan including process, impact, and outcome evaluation activities.

Table 1 *Continued*

Steps	Tasks	Examples
Step 7: Process evaluation	Monitor program to ensure fidelity to program blueprints. Provide corrective feedback where changes are needed	• Is the citizen coalition lobbying local government? What could be done better? • Is the plan to provide floss to at least 75% of all local drug stores, hair salons, banks, and other commonly visited public venues being carried out? • Is floss being put out at these venues in places where customers can see them? Are customers taking the free floss? How much is being taken per customer and per day? • Is the program to provide free access to dental care for persons earning less than \$20,000 per year being set up? • Is the “healthy mouth, healthy body” social marketing campaign being implemented as planned? • Is the target audience being significantly exposed to the campaign messages?
Step 8: Impact evaluation	Assess whether behavioral and environmental sub-objectives (developed in step 3) were met	<i>Environmental</i> • Is floss being provided to at least 75% of all local drug stores, hair salons, banks, and other commonly visited public venues? • Are new restrictions being put on the number of allowable billboards, posters, and local media advertisements that promote the use of smokeless tobacco? • Is free access to dental care for persons earning less than \$20,000 per year taking place? How often are people taking advantage of this new program? <i>Behavioral</i> • Are people improving their flossing behavior, reducing high-sucrose beverage intake, and reducing smokeless tobacco product use as stated in the goals? • What does a rigorous evaluation of the social marketing campaign show?
Step 9: Outcome evaluation	Assess whether the program had its intended public health impact	In 2015, has the number of people living in the community with periodontal disease been reduced by 30%?

by which you will ultimately judge the success of the program. More importantly, the objectives serve as the overarching guides for the remainder of the planning process. It is important not to stray from these initial objectives – anything that one does from this point forward must serve at least one of the objectives developed in step 2. The objectives should be written carefully to specify the exact degree of desired improvement in a quantifiable health indicator and to include a time frame for reaching the objective. For example, “By the year 2015, the number of people living in the community who have been diagnosed with periodontal disease will be reduced by 30%.” Notice that the objective is measurable and has a time limitation.

This step of the planning process should be predicated on existing data (so as not to create unrealistic planning objectives) and should be directly responsive to the identified needs of the community. There is no standard number of objectives that should be identified at this step, but each objective will spawn multiple sub-objectives, so one should exercise caution in being overly optimistic about the number of objectives that can be achieved given the resources and time available. Of note, sub-objectives are simply steps that must be taken (and met) to achieve objectives. It is not unusual for one objective to require three or more sub-objectives.

Behavioral and environmental diagnosis (step 3)

A careful look at Figure 1 makes clear that the third step actually comprises two parts. The logic here is simply that meeting the health objectives requires changes in both the behavior and environment. The identified environmental and behavioral factors will become the sub-objectives that direct the remainder of the planning and intervention activities. For example, one important environmental factor leading to a reduced prevalence of oral cancer may be the widespread social norm that confers “masculinity” for using smokeless tobacco among males in the community. Environments that support risk behaviors relevant and applicable to the objectives developed in step 2 must all be identified at this point in the planning process. All possible “types” of environments should be considered. This includes economic environments, policy and legal environments, family environments, and local culture. Given the step 2 objective of reducing incidence/prevalence of periodontal disease, the following environmental sub-objectives might apply:

- Reduce the number of billboards, posters, and local media advertisements that promote the use of smokeless tobacco, by 50 percent, within 6 months.

- Within 6 months, provide no-cost supplies of floss to at least 75 percent of all local drug stores, hair salons, banks, and other commonly visited public venues.
- Within 6 months, provide “safety nets” for uninsured people and help those who are insured pay for out-of-pocket costs associated with dental visitation.

Program planners frequently make the initial mistake of confusing environmental sub-objectives with behavioral sub-objectives. For example, the following sub-objective – when achieved – does nothing to change the environment. Instead, it may be a product of changes to the environment or it may be a direct consequence of the health promotion program.

- The prevalence of flossing among community residents of all ages will double within 12 months. This sub-objective is, of course, vital to the step 2 objective of reducing periodontal disease; however it is not one that changes the environment – in fact, it may be an outgrowth of achieving environmentally-oriented sub-objectives (e.g., improved community norms about dental hygiene, increased access to floss, and dental professionals who take “time out” to teach people how to floss). As you can imagine, then, environmental sub-objectives are often directed toward setting the stage for achievement of the behavioral sub-objectives. Thus, it is important to keep the two types of sub-objectives separate in one’s thinking and planning process. Behavioral sub-objectives are always focused on an act that is volitionally engaged in by members of the community. In this case, other examples might include:

- Consumption of high-sucrose beverages will decrease by 30% within 9 months
- Consumption of smokeless tobacco products will decrease by 50% within 12 months.

When first writing behavioral sub-objectives, many people are tempted to drift into writing statements that actually present the desired product of environmental and behavioral changes such as, “Prevalence of dental caries will decrease by 75 percent within 12 months.” Although one could argue that dental caries represent a tangible proxy of volitional behaviors, caries are not reflective of a measurable behavior. Of note, considering measurement is indeed a pivotal aspect of the writing of sub-objectives. Sub-objectives must be amenable to reliable and valid quantification and there are plenty of ways one could go wrong during this process. For example, if “reducing the number of dental caries” was written as an objective (note, as stated, it cannot be a sub-objective), then an inherent and potentially fatal evaluation bias becomes evident – namely the success of the program may translate into more people going to the dentist than ever before (some for the first time), thereby artificially elevating the community incidence of caries.

Educational and ecological diagnosis (step 4 in the model)

This fourth step is arguably the most difficult in the planning process, yet it is without question a vital step. The overall task here is to develop a plan designed to achieve the very first sub-objective that was developed in step 3. Then, a very different plan is developed to achieve the second sub-objective and so on. This point is often missed by neophyte planners – every step 3 sub-objective will require a separate plan and each plan will thus have sub-objectives to the step 3 sub-objectives. In essence, a type of pyramid can be visualized as showing how the overarching goal (from step 1) becomes the epitome of an expansive number of supporting activities (steps 2-9 in Table 1).

While working at the “base of the pyramid” may seem like a formidable planning task, the PPM provides an eloquent organizational strategy that can be employed to streamline the planning. This is the point in the process when the planner must consider the predisposing, reinforcing, and enabling factors (the PRE of PRECEED).

Predisposing factors

Predisposing factors exist at the cognitive level. Thus, constructs such as self-efficacy, attitudes, and beliefs are all predisposing factors. For example, the step 3 behavioral sub-objective involving decreased consumption of high sucrose beverages would, in part, be achieved by education campaigns that change community perceptions about these drinks – perhaps instilling the appropriate belief that even moderate consumption is a prime cause of tooth decay, diabetes, and obesity. Another predisposing factor for this same sub-objective might be knowledge regarding how to determine whether a given beverage is high in sucrose or other problematic sugars (e.g., teaching people about ingredients such as high fructose corn syrup).

Reinforcing factors

Once all of the relevant predisposing factors for any one sub-objective have been identified, the next challenge is to consider how a given behavior can be encouraged in a community to the point of maintenance (meaning the behavior occurs on a regular basis in a substantial portion of the population). Thus, the concept of reinforcement comes into play. Again, as simply stated, reinforcement is a method of helping to assure the desired behavior recurs. Reinforcement may be environmentally engineered. For example, perhaps one of the most reinforcing activities that can be orchestrated by dental care providers is to praise patients who are clearly practicing good oral hygiene. Social norms can also be reformed to serve as a method of reinforcing healthy

practices. This has clearly been the case in California as that state has successfully shifted norms about smoking such that people are socially reinforced for quitting (6).

Enabling factors

All too often, people who engage in health promotion tend to focus mostly on changing predisposing factors and tapping or creating reinforcing factors. These same efforts, however, often fall short of success because the community members may not have the ability to act on what may otherwise be strong intentions to adopt a given health behavior. Enabling factors represent the necessary conditions that must be present for the behavior to occur. Consider, for example, the use of a high-speed electric toothbrush, the cost of which in the neighborhood is about \$100. Obviously, some of the people who need these appliances the most are the people who can least afford to spend the money for such an appliance. Dental insurance, dental co-pays, and even transportation to and from dental clinics may be necessary factors to help people translate positive intent for dental care into actual behavior. Enabling factors may also include skills that are needed to physically perform the behavior. For example, flossing is not at all an intuitive practice and teaching the correct procedures involved in this rather complex behavior is clearly needed before people can effectively floss. In the absence of the skill, many people may become frustrated with their efforts to floss effectively and some may even abandon them.

Doing a “PRE analysis”

All behavioral sub-objectives developed in step 3 must be analyzed for their respective predisposing and reinforcing factors. Furthermore, the behavioral sub-objectives should each be analyzed for any applicable skill-related enabling factors. Note, however, that enabling factors that pertain to changing the environment may have already been identified in step 3 as environmental sub-objectives. In the end, the program planner will conclude this step by having a long list of step 4 sub-objectives that must be met through planned activities. The question of how best to exhaustively identify all relevant step 4 sub-objectives and how best to achieve each one is, of course, daunting. Fortunately, this is where theory comes into play.

The PPM does not prescribe any one theory. Instead, it allows for the fact that every program will have different objectives, and thus, theory should be used as needed. For example, a common question is, “How can I best identify the predisposing, reinforcing, and enabling factors?” The answer goes back to theory. The theory of planned behavior would suggest that attitudes consuming a low-sugar diet and subjective norms pertaining to such a diet may each be cognitive factors that are linked with the actual decrease of sugar con-

sumption. The theory would posit that increasing the community prevalence of favorable attitudes and of favorable normative perceptions would create a corresponding decrease in sugar consumption throughout the community. Thus, two predisposing factors can be identified using the theory of planned behavior as a guide. The theory would also suggest that inhibiting and facilitating factors are important – these roughly correspond to the construct of enabling factors in the PPM. Examples might include easy access to fresh (good tasting) low-sugar foods, reducing the typical cost of these foods, and teaching people about low-sugar alternatives to various foods. Unfortunately, the theory of planned behavior would not be instructive relative to reinforcing factors; however, social cognitive theory might be extremely useful in this regard. Again, the PPM can be used to direct theory selection efforts. Which theory (or theories) is/are selected is very much a product of the step 4 sub-objectives.

Administrative and policy assessment (step 5)

In many ways, this is the most challenging and most critical step of the entire planning process. The initial task is to assess the capacity and resources available to implement programs and change policies such that the step 4 sub-objectives can be met. For example, consider a likely step 4 sub-objective: “Provide free access to dental care for persons earning less than \$20 000 per year.” Determining what state and local programs and insurance “safety nets” may already exist would then become a priority in terms of meeting this sub-objective. In the absence of any such programs, the assessment would lead the planner to seek political and private support for the creation of new programs and policies that would support the sub-objective.

In step 5, the goals can be divided into two categories: health education and the larger, more encompassing, category of changing policy, regulation, and organizational structures (the PRO of PROCEDE). Health education efforts are a long-standing tradition in public health. These efforts may be loosely organized such as hygienist- and dentist-delivered teaching and counseling to patients in the dental chair. Conversely, the efforts may be formal and structured as would be the case when an oral health curriculum is delivered to public school students. Pamphlets, billboards, and public service announcements are all examples of formally delivered health education. Thinking about Figure 1, health education efforts are aimed primarily at predisposing and reinforcing factors; however, highly interactive health education can build requisite skills for protective behaviors, thus enabling the enactment of those behaviors. A prime example of this would be informal health education designed to teach patients improved brushing and flossing techniques. The interactive component of this teaching may often be lacking –

this would involve guided practice followed by verbal correction from the practitioner. The cycle of practice and correction should ideally continue until the patient achieves mastery of the requisite skills.

Many of the sub-objectives cannot be met through education alone, however. Step 4 sub-objectives that are classified as enabling factors and do not have a skill base are achieved through changes to the environment. It is helpful at this juncture to think about the environment in very broad terms. For a child or teenager, as an example, the *family environment* is likely to be a critical determinant of oral health. The *community environment*, in turn, may establish norms for families. The *economic environment* is extremely profound in terms of oral health and this is tied to a host of insurance policies in the *workplace environment* and the *political environment* (in terms of entitlement programs). When non-skill enabling factors become the target of step 4 sub-objectives, it is incumbent on the program planner to creatively manipulate the environment of people in the community in ways that lead to constructive change. Clearly, this is where time and resources can become an issue, but simply “backing down” and reverting to a health education-only approach could spell program failure. Rather, creating lasting and substantial change to the health of the community will require an outlay of money in addition to strong political will.

As an example, in communities where caries and gingivitis among children are common, the installation and staffing of school-based dental clinics would be a challenging but rewarding task. These clinics could actually serve obvious enabling functions, but they could also become the nexus of dental health education programs for children and even their parents. In this scenario, the astute program planner then becomes a person charged with fundraising or the obtaining of public funds through political support. Unlike a health education-only approach, the program planner involved in “PRO efforts” will need to have a diverse skill set and he/she will need to serve a range of functions from lobbying and budgeting to teaching and advocacy.

Implementation (step 6)

This step is included in the logic model to signal the initiation of evaluation. Evaluation is the “thread” that runs through any health promotion program – it is not simply an activity that occurs once a program is terminated. Before implementation begins, a complete plan for program evaluation must be in place. The plan should have three parts: process evaluation, impact evaluation, and outcome evaluation.

Process evaluation (step 7)

An age-old adage is that even the best laid plans can go awry. An applicable analogy here may be the work of an architect.

The architect designs a home by making blueprints which are then (hopefully) followed exactly by the builder and the respective subcontractors. Whether the builder and subcontractors actually follow the exact specification of the plans, however, is a matter of process evaluation. Thus, building inspectors and the architect will plan frequent inspections of the building project to assure that fidelity to the blueprints has been achieved. The key word here is fidelity. In health promotion programs, the staff may or may not faithfully follow protocols and procedures developed during the planning stages; thus, monitoring is required followed by corrective feedback. This process of monitoring and correction is iterative and ongoing – ending only when the program comes to a close.

Impact evaluation (step 8)

Once the program has reached maturity, and fidelity to the plans is ascertained, the key question is, “Were the behavioral and environmental sub-objectives (as developed in step 3) met?” This is known as the impact evaluation because these sub-objectives are directly controllable. For example, if an environmental sub-objective was to reduce access to high-sugar beverages, the degree of success in obtaining this change is a direct function of the planning and implementation efforts. Impact evaluation determines whether the intervention achieved its intermediate outcomes, which typically are more readily measurable than the long-term health outcomes. The impact evaluation may show, for example, that behaviors did change at the population level. Equally important (if not more so), the impact evaluation may also show that targeted environmental structures were successfully changed. Sustained success on one or both of these fronts is theoretically an indicator of eventual declines in the disease outcome or condition that was initially targeted (i.e., the primary objective of the intervention program).

Outcome evaluation (step 9)

Ultimately, a well-designed, successful health promotion program may or may not have a direct correspondence with improved indicators of health. This principle is a simple consequence of epidemiology. The phase 3 sub-objectives are really protective factors. Protective factors, in turn, reduce the risk of disease by some estimated value (usually expressed as an odds ratio in epidemiology). Risk reduction and disease prevention, however, are not synonymous concepts. Consider, for example, the previously stated step 2 objective of reducing periodontal disease by 30 percent. Let us assume that five step 3 sub-objectives were developed for this objective. Furthermore, let us assume that three of those five sub-objectives yielded a successful impact evaluation. Does this mean that the objective will be met? What if four of the five

sub-objectives were successfully achieved? In fact, even if all five sub-objectives were met, the assurance of reaching the 30 percent reduction on periodontal disease objective would still be somewhat a function of factors such as depth of program penetration into the community, prevalence of lasting behavior change, and factors beyond program control such as genetics and the preexisting oral conditions in the community. Indeed, with these challenges in mind, it is easy to see why a successful outcome evaluation is the “holy grail” of program planning, implementation, and evaluation.

Summary

The PPM has been used in health promotion since the publication of *Health Program Planning: An Educational and Ecological Approach* initially published in 1980 by Drs. Larry Green and Marshall Kreuter. More detailed descriptions and sample applications of the model can be found in their 4th edition (5). The basic assumption of the PPM is that behaviors are complex and have multidimensional etiologies. This planning model is not a theory; instead, it is a method of approaching the complex task of making substantial progress in the reduction of morbidity and mortality at the community level through developing, implementing, and evaluating health promotion programs.

The PPM guides the program planner to think logically about the desired end point and work “backwards” to achieve that goal. Through community participation, the planning process is broken down into objectives, step 3 sub-objectives, and step 4 sub-objectives. Conceptually, this approach to health promotion provides context to the use of theory, with theory being applied at the fourth step. This observation teaches a vital lesson, namely that program planning is larger and a more comprehensive task compared to the subservient function of theory selection and application. In essence, saying that a program is “theory-based” is a far cry from assurance that it will be sound and effective. Using the PPM is labor-intensive and this may be seen as a drawback to many professionals. But is not tertiary prevention also labor inten-

sive and even far more costly? Surgery for oral cancer is a clear example, as the resources devoted to the techniques and use of these procedures is far more involved than the use of the PPM for the primary prevention of oral cancer. So, yes, achieving prevention through program planning using a model such as the PPM is not easy to do and requires resources, but these efforts can pay off in the long term. As the wise saying goes, “an ounce of prevention is worth a pound of cure.”

Conflict of interest

The authors declare no conflict of interest.

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