

# **FACTORS INFLUENCING IMPLEMENTATION OF BIOMEDICAL RESEARCH PROJECTS IN THE PUBLIC SECTOR IN KENYA: A CASE OF KENYA MEDICAL RESEARCH INSTITUTE**

**James Nguya**

Master of Arts in Project Planning and Management, University of Nairobi, Kenya

**Prof. Christopher Gakuu**

Department of Extra Mural studies, School of Continuing and Distance Education, University of Nairobi, Kenya

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## **ABSTRACT**

This research sought to assess the factors that influence biomedical research projects implementation in the public sector with reference to the Kenya Medical Research Institute (KEMRI) biomedical research projects. The purpose of the study was to investigate the factors influencing biomedical research projects implementation in the public sector with reference to the Kenya Medical Research Institute. Specifically, the study examined the influence of resource availability, top management, organization structure and project team leader on biomedical research projects implementation in the public sector. The theories that underpinned this study include the resource based view theory, the empowerment theory and systems theory. A descriptive research design was adopted. The target population consisted of all the research and technical staff of the Kenya Medical Research Institute of the various cadres, from which a sample size of 211 was selected. The stratified random sampling technique was used to select the sample size for the study while simple random sampling was used in the picking of participants. This research further applied both primary and secondary data. The main tool to be applied for data collection to conduct this study was a questionnaire. Descriptive statistics such as frequencies, percentages, mean score and standard deviation were estimated for all the quantitative variables. Inferential statistics such as Pearson correlation and multivariate regression were used to analyze the data. Correlation was used to generate results on the association between the variables while

regression was used to generate results in the relationship between the independent variables on the dependent variable. Data was presented using frequency tables. The study found that a primary ingredient in successful project implementation is the style of the leadership in the institution. The study also found that there was sufficient and qualified manpower in all biomedical research projects. The study found that strategy implementation in the institution is supported by the existing power structure. The study found that there are clear lines of authority and accountability. The study concluded that resource availability had the greatest influence on the implementation of biomedical research projects at the Kenya Medical Research Institute, followed by management support, then project team leader while organization structure had the least influence on implementation of biomedical research projects at the Kenya Medical Research Institute. The study recommends that the government and government agencies with the help other central government agencies and the ministry of health should put in place measures that would ensure health grants from international governments are utilized for the implementation of intended biomedical research projects. The study further recommends that management in biomedical research projects should ensure that they employ and deploy qualified and competent individuals for project monitoring processes and implementing activities.

**Key Words:** *implementation, biomedical research projects, public sector, Kenya Medical Research Institute*

## **INTRODUCTION**

A typical biomedical research projects is a complex network consisting of many different parties at various stages of the project cycle. According to Ling and Ling (2012), the three major types of players are: Producers (product manufacturers), Purchasers (group purchasing organizations, or GPOs, and wholesalers/distributors), and health care providers (biomedical research organization systems and integrated delivery networks, or IDNs). Manufacturers make the products; GPOs and distributors aggregate a large number of biomedical research organizations in an attempt to leverage the economies of scale while funding their operations through administration fees and distribution fees; the provider, such as biomedical research organizations, consume the products while providing patient care; and finally the payers, such as the individual patient and his employer, pay for the services of the provider. Within the health care project cycle, the products (drugs, devices, supplies are transported, stored, and eventually transformed into health care services for the patient (Tracey & Vonderembse, 2005).

Project management puts a strong emphasis on the integration of processes among the producers, distributors and healthcare providers (Horatiu, 2012). Within the healthcare sector these processes might refer to physical products like pharmaceuticals, medical devices and health aids but also to processes associated with the flow of patients. In both cases the basic rationale of a project management approach is founded in the belief that intensive co-ordination and integration between operational processes might lead to a better health project performance (Nuruzzaman, 2011). In this regard, project management research in health care has been a topic of extensive research in the recent past, all with the aim of reducing the cost of healthcare without sacrificing service typically by improving the efficiency or productivity of the system.

A roundtable discussion at the MIT Center for Transportation and Logistics (Meyer & Meyer, 2010) highlighted some of the important issues in healthcare, particularly in projects. Some of the problems and constraints discussed included the high cost of healthcare, long supply lead times, unreliable transit times, wasteful behaviors, and complex requirements and regulations. The solutions focused on making projects more demand driven, a move towards reduced lead times and elimination of excess stock levels, increasing collaboration between the various parties involved, increasing visibility of practices and inventories, and implementing more and better standards.

In a survey released by Healthcare Financial Management Association (HFMA) (Aberdeen-Group, 2013), executives and project leaders of biomedical research organizations identified ways to improve care and reduce cost. These included standardizing supplies, decreasing distance from suppliers and complexity of logistics in global companies with a view to create shorter order lead times and lower inventory levels, central purchasing, improving demand forecasts, reducing labor costs through automation, improved collaboration with vendors and online purchasing.

## **STATEMENT OF THE PROBLEM**

Project implementation is usually discussed in terms of success factors and success criteria. Success factors are considered to be those aspects of management that lead directly or indirectly to the success of the project while success criteria are defined as the measures by which success or failure of a project was judged (Cooke-Davies, 2012). Perhaps the simplest answer to the question of which factors contribute directly to project success is the ability to stay within the cost, time and performance specifications of the project (Lai, 2014). According to Meredith (2012), the factors associated with project success are different for different industries. When these factors are given proper importance, they can transform a project. If an implementation team takes time to create tangible, achievable and measurable critical success factors (CSF's) and every decision made during the execution of the project is defined and managed based on these CSF's then the project implementation is a success. A review of five recently completed projects by KEMRI in its website reveals an impressive performance track record. In a project on Pediatric HIV Drug Resistance Testing in Kenya using Dried Blood Spots technology, 2010-2011, the review report points out the timely completion of the project, the efficiency with which the blood samples were used, the project relevance to biomedical research using technology, and the effectiveness of the project findings in policy formulation. In a 2010-2011 study aimed at designing and constructing software and hardware platforms "Data Centers" for the improvement of health service delivery and e-government, KEMRI, Hewlett Packard-CHAI, the proposed project objectives were all met in a timely manner with Data Centers put up in various healthcare delivery institutions including the Kenya Medical Supplies Authority (KEMSA), and the Kenyatta National Hospital. In Infection and Parasite Control and Research Project (May 2001 to March 2003), KEMRI focused on blood safety, research on HIV and opportunistic infections and community-based HIV/AIDS health education (Ndegwa, 2015). The project review committee concluded that the project is highly relevant, effective for yielding various valuable outputs to enhance KEMRI's organizational capacity related to HIV, viral infections and opportunistic infections, efficient in that most inputs were used for accomplishing the outputs and they are all achieved to a certain degree and that sustainable in that the financial conditions are the key to sustaining project outcomes and independent development of the KEMRI. In Population-Based Monitoring of HIV Drug Resistance Emerging in Adults during Treatment and Related Programme Factors in Sentinel ART Sites in Kenya, commissioned by WHO in 2008, the project was rated excellent by the review team on all accounts including efficiency, relevance, effectiveness and sustainability (Waweru, Nyikuri, Tsofa, Kedenge, Goodman & Molyneux, 2013). The literature identifies a range of success factor but there is no research that exists which illustrates the relationship between success factors and the successful implementation of the biomedical research projects. This study sought to investigate the relationship of four critical success factors (resource availability, top management support, organization structure, and project team leader) and project implementation success in KEMRI in order to help the project parties to minimize the project implementation problems. The four CSFs

selected are not unique to biomedical research projects implementation; however, they gain importance than the others because of the specific characteristic of biomedical research projects implementation.

## **PURPOSE OF THE STUDY**

The purpose of this study was to establish the factors influencing implementation of biomedical research projects in the public sector in Kenya with reference to the Kenya Medical Research Institute.

## **OBJECTIVES OF THE STUDY**

1. To examine the influence of resource availability on implementation of biomedical research projects at the Kenya Medical Research Institute.
2. To establish the influence of top management support implementation of biomedical research projects at the Kenya Medical Research Institute.
3. To determine the influence of organization structure implementation of biomedical research projects at the Kenya Medical Research Institute.
4. To assess the influence of project team leader implementation of biomedical research projects at Kenya Medical Research Institute.

## **LITERATURE REVIEW**

### **Projects Implementation in the Public Sector**

Project implementation is a process whereby project inputs are converted to project outputs. It involves putting in action the activities of the project, putting into practice what was proposed in the project document and management of the project or executing the project intentions. Although the topic under review has been previously explored extensively out of the country but most of these studies were context specific, their implementation and implication are usually limited to countries, and the operating environment where these studies were conducted (Toor & Ogunlana, 2009). There is a lack of effort to contextualise the findings into local context where the structure, culture and maturity of the concerned organisations are different. Although emphasis has been given on the integration of process improvement programmes and conflict resolution process in the project management, but potential of human-related factors is not explored in detail. On the other hand, Lim and Mohamed (2009) suggested that project success can be classified into two categories, which are the macro- and micro-view point. Both viewpoints consider the usual criteria of time, cost and quality but remain silent on human-related factors as well.

In analysing project implementation, Pennypacker (2010) battles that there is no single arrangement of measures that all around applies to all organizations. The suitable arrangement of

measures relies on upon the association's system, innovation, and the specific business and environment in which they contend. The creator assists diagrams benchmarking measures for project administration execution include: degree of profitability, efficiency (yield), quality, execution cost, plan execution, consumer loyalty, process duration, prerequisites execution, worker fulfilment and arrangement to vital business objectives. Project execution estimation alludes to a continuous assessment of the adequacy and importance of a given project. Execution estimation can be utilized to research the general execution of a worker or group of representatives in a given project. A project can likewise be dragged down because of horrendous correspondence, unequal workloads, or inability to co-work among laborers. There are numerous elements that figure out if or not a project is a win, fluctuating basically in light of the underlying goal of the project.

Goodwin (2012) analyzed the prerequisites crucial for the achievement of a group tourism companies and reasoned that there had been characteristics which have been important in clarifying achievement and disappointment in the execution of speculations: a durable and strong group; genuine group interest, ownership and control; appropriation of a business mentality, anticipating money related feasibility from the start; engagement with the private division; activities basically in view of market query and request driven item improvement; providing alluring, pleasant items principally in light of natural and social resources and which are more convenient to voyagers; time; engagement, support and coordinated effort in the association through partners with key ranges of skill; straightforward and responsible administration, administration and basic leadership structures and in addition sound, master monetary administration; and checking and differentiate so that groups and others can share and gain as a matter of fact and guarantee persevered achievement. In their research, Iyer and Jha (2011) recognized numerous variables as having affect project esteem execution, these incorporates: mission supervisor's ability, best organization direct, project chiefs planning and administration aptitudes, checking and criticism by method for members, decision making, coordination among project members proprietor's capability, social situation, financial situation and climatic conditions.

Pheng and Chuan (2012) portrayed wander accomplishment as the finishing of a project inside attractive time, cost and quality and achieving customer's fulfilment. Project achievement can be brought out through the brilliant execution of signs of the project. Thus, achievement alludes to task achievement and general execution alludes to general execution of pointers, for example, project administrators. Human components played a vital position in choosing the general execution. Scientific proof from people in general segment gives to some degree consolidated results. For instance, Hyndman and Eden (2010) met the CEOs of nine organizations in Northern Ireland. Every one of the respondents bring up that a focal point of consideration in mission, targets, points and execution measures had expanded the general execution of the association for the advantage all partners (Bushman et al., 2013). Respondents also demonstrated that the negative usage of the framework that esteem productivity over excellent and additionally

transitory over long haul comes about, and in addition the inclination to overemphasize numbers to the detriment of judgment, could risk execution.

A successful project and the equally successful implementation of the project are the most reliable signs of good management. In Namibia, Management of institutions formulates strategies to guide operational activities on a yearly basis. Focus is on developing strategies that are effective in facilitating continuous improvement of operational activities at the institutions. The country's challenge is how to maintain consistency in managing the implementation process of strategic decisions (Sipopa, 2009). Schaap (2012) contends that managers are mainly comfortable with planning activities than with implementation, organizing, leading and control. This suggestion is supported by some managers who believe that project implementation is the responsibility of operational personnel.

In a developing country such as Kenya, health projects form a critical part of the health care sector. Health projects are undertaken to improve the health of the community through equity and access. Successful administration of benefactor subsidized undertakings depends fundamentally on legitimate venture choice, extend configuration, extend execution, observing and assessment. It has also been observed that, Organizations are frequently portrayed as the channel through which; wealth flows from rich to developing countries. Kenya included, poverty reduction, and empowerment of the poor (Engela & Ajam, 2010). This has led to explosive growth of international and local non-governmental organizations in Kenya. According to World Bank (2014), Kenya received public current transfers (money sent to non-governmental organizations and civil society organizations) worth US\$ 0.08 billion in the last year. Besides, values, standards, social conviction and assessments of the neighborhood individuals which are influenced specifically or by implication by advancement mediations ought to likewise be considered. Something else, manageability of such undertakings may by and large be addressed (Khwaja, 2014).

### **Resource Availability and Implementation of Biomedical Research Projects**

Resource availability is a key point of success for a project seems relatively straight forward. It may be straight forward but it is the most ready failure point on the majority of projects as it implies putting the right people in the right place at the right time with enough time to do the job the right way (Frimpong et al., 2013). The relationship between project planning aspect and the degree of success/failure in projects is quite controversial. Dvir (2013) argue that even though a decent level of planning for a successful project is vital, there is not an essential positive correlation between planning and success, if not negative all together.

A project cannot proceed without adequate funding, and the cost of providing adequate financing can be quite large. For these reasons, attention to project finance is an important aspect of project management (Herzner, 2012). Finance is also a concern to the other organizations involved in a project such as the general contractor and material suppliers. Unless an owner immediately and completely covers the costs incurred by each participant, these organizations face financing

problems of their own (Kendrick, 2014). Financial planning therefore focuses more on the cost than the time, so spending excessive efforts to save money to avoid cost overruns, will create delays which result in time overruns that are more costly than what was planned for.

A crucial consideration in project management is the availability of an efficient and sufficient quantity of qualified craft workers, supervisors, managers, and staff. To attract key qualified staff, a number of strategies can be adopted: Offer competitive wages and benefits; Provide job security; provide a safe and healthy work environment; treat workers fairly and with respect and provide good working conditions (Frame, 2012).

Garton and Erika (2012) argue that the first step is to determine what competitive wages and benefits are in the project area. Necessary tools include wage and benefit surveys and governmental resources. It is necessary to note that workers have transferable skills and knowledge—good workers have other options, and therefore it is important to consider hiring someone whose skill set is similar to, but not exactly the same as, what one typically hires (Belassi, 2010).

Personnel staffing plans can help project managers acquire workers effectively and creatively by accounting for seasonal slumps and other variables. Cross- or multi-skill training gives them more flexibility in who does what (Bryde, 2011). Worker sharing can reduce the need for layoffs and rehiring. Careful scheduling of project startups also can play a role. According to Cooke-Davies (2011), owners in a local area who are considering when to start up new, large projects that might cause a shortage of craft workers should coordinate their efforts and not begin all the projects at the same time. Phasing projects in over time will prevent a drain of needed available craft workers out of the job market.

The first step toward a safe and healthy work environment is to adopt and maintain effective office and project safety programs. Include safety performance in all supervisor and manager performance evaluations (Crampton, 2014). Part of the challenge ahead lies in understanding the changing demographics of the work force and what they mean. Diallo (2014) observes that different generations hold different values and expectations of their work lives. People look for environments that support their values and meet their expectations. Participatory management techniques can help attract and retain employees by helping fulfill those goals.

According to Ika (2009), for effective funds disbursement and distribution in donor funded projects, there is need to establish secretariats, financial and management systems to support the administration of these funds meeting the criteria for due diligence, results-based management, and effective and timely disbursement. Systems can be reinforced through ongoing and rigorous monitoring, evaluation and reporting mechanisms. Roodman (2010) adds that there is also need on the part of the donor for supporting fund recipients to maximize the effectiveness of their projects. This can include support and advice in the design and development of funded projects, as well as provision of training and technical assistance to support adherence to donor requirements such as results-based management, gender equality, and reporting and environmental impact assessment.

## **Management Support and Implementation of Biomedical Research Projects**

There is no doubt that executives play a crucial role in the process of implementing project investments (Kohli & Devaraj, 2014). A top management team must be proactive in its role of overcoming inertia if project implementation success is to be realized. The characteristics of a management team expected to be proactive in initiating strategic change include receptivity to change, willingness to take risk, diversity in information sources and perspectives, and creativity and innovativeness. Receptivity to change suggests openness to pursuing different business approaches, essential to strategic change. Willingness to take risk is important because changing firm strategy involves risk: established ways of conducting business are abandoned in favor of making commitments to strategic directions for which the payoffs are not guaranteed.

Business today is operating under high level of uncertainty, projects implementation are open to all sorts of external influence, unexpected events, ever growing requirements, changing constraints and fluctuating resource flows. This clearly shows that if projects are applied and steps are not taken in order to manage them effectively and efficiently, the chance of failure is high (Dutton & Duncan, 2012). Therefore a top management team's diversity and demographic composition is a key indicator of these four tendencies. Specifically, certain demographic traits suggest receptivity to change and willingness to take risks, while demographic heterogeneity indicates diversity of information sources and perspectives and creativity and innovativeness in decision making.

According to Schneider (2010), managers ought to provide a road map for project success as implementation will inevitably be unsuccessful if the organization's culture is not properly aligned with, and supportive of an overall business strategy. Project success should become a business objective of the healthcare industry and should give equal prominence to technology, people and processes involved in construction projects. Ruddock (2010) adds that only in such a scenario will it be adopted by the industry as a whole. The strategic and cultural factors are qualitative and have been studied separately through qualitative analysis. Management support by project managers and team members is defined by the factors affecting their perceptions as well as the factors affecting decision making at the organization level.

The biomedical research projects management process is complex, usually required extensive and collective attention to a broad aspect of human, budgetary and technical variables. In addition, projects often possess a specialized set of critical success factors in which if addressed and attention given will improve the likelihood of successful implementation. On the other hand if these factors were not taken seriously might lead to the failure of the project management (Green, 2011).

According to Liberatore (2011), the use and management of projects has risen to a new prominence, with projects seen as critical to economic in both the private and public sectors. The reason behind the expansion of project-based work typically arise due to the new challenging environment and opportunities brought about by technological developments, the shifting

boundaries of knowledge, dynamic market conditions, changes in environmental regulations, the drive towards shorter product life cycles, increased customer involvement and the increased scope and complexity of interorganizational relationships (Bredillet, 2012).

### **Organization Structure and Biomedical Research Projects Implementation**

According to Belassi and Tukel (2015), a suitable organizational structure may assist the project management team to achieve high performance in the project through gains in efficiency and effectiveness. Specific project objectives are set to be achieved at the end of each project. The objectives may vary from one project to the other. Time, cost and quality objectives are however basic and common to almost all projects; they are discussed in the success subject matter of most projects.

The establishment of management structures for the management of a project is one of the important activities required for accomplishing goals. Shaker (2013) in a publication reviewing Peter Drucker books, who argues that management is the function, which involves getting things done through other people. Basically this involves the following, which are all aspects of setting organisation matters for performance: Getting Managers with leadership capabilities, Getting staff with competence and appropriate skills, Placing responsibilities on people for successful completion of the project, Establishing clear delegated authorities Defining proper communication lines. Since these outlined duties relate to the matters concerned with internal organizational running, it may be argued that they are solely for the purpose of improving only organizational performance.

Some of the internal organisational matters such as organisational learning practices increase project success too. The tendency to have the project success increased therefore lies in the ability of the manager to develop certain strategies within the organisation. The activity of setting a project organisational structure is, for instance, one of the major organisational matters whose influence on project performance may be significant (Kotnour, 2012).

In a research work by Sarfo (2011) and citing others the study reported that the organizational structure adopted for management of building projects is an important area to consider for the success of projects. Weaknesses in this area of project management lead to poor project performance regardless of organizational facilitators such as senior management commitment and leadership style (Cooper, 2013). Loo (2013) also grouped project management activities that facilitate project success under two main areas, which require the establishment of organisations structure for their effectiveness. The areas cover technical (for example planning, controlling, and procedures) and people (leadership, communication, and conflict management).

### **Project Team Leader and Implementation of Biomedical Research Projects**

According to Ahmed et al. (2013), project leadership is the ability to lead in most powerful manner while leading others in the project works. It is the process of inspiring and motivating

project towards the achievement of project goals and objectives. McGrath and MacMillan (2000) suggested that effective leadership behaviors can facilitate the improvement of performance when organizations/agencies face new challenges. Ayub et al. (2015) in their study found a significantly positive relationship between project leadership facets and project outcome that among all facets of project leadership; stability is strongly correlated with project outcome. Scholars have also identified the importance of strong and competent leadership in agencies that work closely with the other agencies for which the ongoing responsibility for professional development of those in charge is required.

Darby (2014) eluded that management requires a mixed range of expertise to support various agencies working together effectively; it also requires shared leadership, logistical management and political support to collectively achieve the necessary objectives. There is need for leadership that requires a combination of multiple attributes that are seldom found in one person and supports the notion of the development of a leadership team linked to mechanisms of collective accountability. A substantial increase of demands on individual leaders and the call for more collective leadership where skills and responsibilities are more appropriately distributed. Smillie and Hailey (2001) emphasized the value of a leadership team or leadership organizational culture that supports collectivity, participation and collegiality.

Participatory leadership and goal-oriented leadership among others increase efficiency in project implementation. Kuen et al. (2008) in his study concluded that the three main factors that determine project success were top management support, clear project mission and competency of management team. Blaskovics (2014) established that managers directly have an impact on the project triangle and on the stakeholder satisfaction while they have an indirect impact on the client satisfaction. The study identifies two poles of leadership as general or chase player where the first one finds the hierarchical /organizational features very important while second one finds communication and proper capable and motivated project team very important. In conclusion, the scholar noted that chase player characteristics are the dominant among project managers. Leadership styles influences the performance of projects (Kavenge, 2015). The study established that there is no one superior leadership skill to the other, but different competences mixes are needed at different managerial levels, with some like interpersonal skills being equally important at every level of management. McGrath and MacMillan (2000) noted that there is significance relationship between leadership styles and project performance and that effective leadership style is seen as a potent source of management development and sustained competitive advantage.

## **THEORETICAL FRAMEWORK**

### **Resource Based Theory**

The resource-based view (RBV) as a basis for the competitive advantage of a firm lies primarily in the application of a bundle of valuable tangible or intangible resources at the firm's disposal. To transform a short-run competitive advantage into a sustained competitive advantage requires

that these resources are heterogeneous in nature and not perfectly mobile. Effectively, this translates into valuable resources that are neither perfectly imitable nor substitutable without great effort. If these conditions hold, the bundle of resources can sustain the firm's above average returns (Crook, 2011).

Resources are the inputs or the factors available to a company which helps to perform its operations or carry out its activities (Black & Boal, 2011). Also, these authors state that resources, if considered as isolated factors do not result in productivity; hence, coordination of resources is important. The ways a firm can create a barrier to imitation are known as “isolating mechanisms”, and are reflected in the aspects of corporate culture, managerial capabilities, information asymmetries and property rights (Hooley & Greenlay 2011). Further, they mention that except for legislative restrictions created through property rights, the other three aspects are direct or indirect results of managerial practices.

King (2010) mentions inter-firm causal ambiguity may results in sustainable competitive advantage for some firms. Causal ambiguity is the continuum that describes the degree to which decision makers understand the relationship between organizational inputs and outputs. Their argument is that inability of competitors to understand what causes the superior performance of another, helps to reach a sustainable competitive advantage for the one who is presently performing at a superior level. Holley and Greenley (2011) state that social context of certain resource conditions act as an element to create isolating mechanisms and quote edition does not exist.

According to the characteristics of the RBV, rival firms may not perform at a level that could be identified as considerable competition for the incumbents of the market, since they do not possess the required resources to perform at a level that creates a threat and competition. Through barriers to imitation, incumbents ensure that rival firms do not reach a level at which they may perform in a similar manner to the former. In other words, the sustainability of the winning edge is determined by the strength of not letting other firms compete at the same level. The moment competition becomes active, competitive advantage becomes ineffective, since two or more firms begin to perform at a superior level, evading the (Ethiraj, 2011). RBV underpinned resource availability variable in the present study. In this case biomedical research projects management is expected to leverage its financial, human and organizational resources to enhance biomedical research projects success.

### **Empowerment Theory**

According to Tones and Tilford (2011), Empowerment theory has been identified as a principal theory across various disciplines. Adapted from Zimmerman's (1984) work, Rappaport (2012) adapted it to community psychology studies. Ever since, the theory has found its way into social studies as a key concept in remedying inequalities and towards achieving better and fairer distribution of resources for communities, (Rose 2011).

According to the theory, empowerment refers to the ability of people to gain understanding and control over personal, social, economic and political forces in order to take action to improve their life situations. It is the process by which individuals and communities are enabled to take power and act effectively in gaining greater control, efficacy, and social justice in changing their lives and their environment. It is a process that fosters power in people, for use in their own lives, their communities, and in their society, by acting on issues that they define as important (Zimmerman, 2010).

This view is shared by Lee (2009) who more recently define empowerment as a notion of people having the ability to understand and control themselves and their environments (including social, economic, and political factors), expanding their capabilities and horizons and elevating themselves to greater levels of achievement and satisfaction. This can be deduced to mean that empowerment is a process that has a number of qualities such as: having decision making power, having access to information and resources, having a range of options from which to make choices. In fact, Zimmerman (2010), the originator of this theory, argues that empowered individuals have the characteristics of high self-esteem, self-efficacy, control over their life and increased socio-political and civic participation.

In this case, empowerment is in line with the definition of the theory as given by Lee (2009) that empowerment is concerned with the transformation of individuals' lives in achieving goals and reaching targets, which they had thought impossible (that is to gain authority, skills, status, self-belief and image, progressing to greater things and increasing rewards. In the present study, management support was underpinned by empowerment theory. To this end, biomedical research organizations are expected to exhibit top management support to their project implementations including by availing project resources, providing training as well as professional development to enhance project performance.

## **Systems Theory**

According to Rudolph (2011), Systems theory is the interdisciplinary study of systems in general, with the goal of elucidating principles that can be applied to all types of systems at all nesting levels in all fields of research. The term does not yet have a well-established, precise meaning, but systems theory can reasonably be considered a specialization of systems thinking; alternatively as a goal output of systems science and systems engineering, with an emphasis on generality useful across a broad range of systems versus the particular models of individual fields (Senge, 2009)

The term originates from Bertalanffy's general system theory (GST) and is used in later efforts in other fields, such as the action theory of Talcott Parsons and the social systems theory of Niklas Luhmann. A central topic of systems theory is self-regulating systems, that is, systems self-correcting through feedback. Self-regulating systems are found in nature, including the physiological systems of our body, in local and global ecosystems, and in climate and in human

learning processes (from the individual and upwards through international organizations like the UN (Bertalanffy, 2011)

A system in this frame of reference can contain regularly interacting or interrelating groups of activities. For example, in noting the influence in organizational psychology as the field evolved from "an individually oriented industrial psychology to a systems and developmentally oriented organizational psychology", some theorists recognize that organizations have complex social systems; separating the parts from the whole reduces the overall effectiveness of organizations (Senge, 2009).

This difference, from conventional models that center on individuals, structures, departments and units, separates in part from the whole, instead of recognizing the interdependence between groups of individuals, structures and processes that enable an organization to function. Laszlo (2012) explains that the new systems view of organized complexity went "one step beyond the Newtonian view of organized simplicity" which reduced the parts from the whole, or understood the whole without relation to the parts. The relationship between organizations and their environments can be seen as the foremost source of complexity and interdependence (Thome, 2012).

The systems theory underpinned information technology variable in the study. In this case, a biomedical research organization was expected to comprise up to date technological software and appliances to formally handle the project process, maintaining good communication with their client, seek clarifications on deliveries and have a conflict resolution system in place.

## **RESEARCH METHODOLOGY**

### **Research Design**

The study adopted a descriptive research design. According to Kothari (2014), descriptive research design is used when the problem has been defined specifically and where the researcher has certain issues to be described by the respondents about the problem. The method was considered appropriate for collecting descriptive data on the sources of biomedical research projects implementation in the public sector with reference at the Kenya Medical Research Institute. Descriptive research design in this case presented a picture of the specific details as regards technical team, resource availability, management support and organisation structure.

### **Target Population**

Target population refers to the entire group of individuals or objects to which researchers are interested in generalizing the conclusions that relate to the research (Kumar, 2019). The target population consisted of the 468 research and technical staff of the Kenya Medical Research Institute of the various cadres. Research staff include the Principal investigators (Principal researchers), Co-investigators (Co-researchers), Laboratory technicians, Statisticians and Project

coordinators while the Technical staff include: Laboratory assistants, Accountants, Scientific and ethics Review Unit (SERU) research administrators and also Scientific Centres administrators (KEMRI is divided into 12 active research centres, each centre has an administrator to deal with matters such as logistics). Research and technical departments staff were chosen due to their involvement in projects at various levels in the institution.

### **Sample Size**

Mugenda (2013) state that the rule of the thumb is to obtain as big a sample as possible. Taking a population size of 468 to represent the entire population in the KEMRI, the researcher adopted the Neuman (2010) formula. According to Neuman (2010), the size of a sample for a particular study was calculated as follows:

$$n_f = \frac{n}{1 + n/N}$$

Where:  $n_f$  is the desired sample size when population is relatively large but less than 10,000;  $n$  is the desired sample size when population is more than 10,000, given at 384;  $N$  is the population size, which in this case is the 468 staff

$$\frac{384}{\sqrt{1 + 384/468}} = 211$$

It follows then that a total of 211 skilled staff formed the study sample size. These were distributed proportionately from 46 research projects in 9 KEMRI Research Centres.

### **Sampling Procedure**

Sampling technique refers to the method of investigation that a researcher employs to strategically investigate a population. The different methods that are predominantly used are probability and non-probability. In probability sampling every member of the sample has a probability of being selected and it is divided into; simple random sampling where by all subsets of the frame are given an equal probability and stratified random sampling. Where the population embraces a number of distinct categories, the sampling frame can be organized by these categories into separate "strata." Each stratum is then sampled as an independent sub-population, out of which individual elements can be randomly selected (Royal Geographical Society, 2013). The study used stratified random sampling technique to select the sample size for the study while simple random sampling was used in the picking of participants.

### **Data Collection Instruments**

This research applied both primary and secondary data. According to Kothari (2014), primary data refers to data collected afresh and for the first time, and happen to be in its original

character. This includes collection of data through a population study by the use of qualitative and quantitative techniques during the study. This can be by questionnaires, surveys, face to face interviews and direct observations. Secondary data refers to the information that has already been published that is from the internet, books, journals, magazines, published articles, organizational records. The main tool applied for data collection to conduct this study was a questionnaire. According to Kumar (2019), a questionnaire is a research tool that has a predesigned list of questions used for communication with the respondents. The respondents read the questions and answer themselves. The questions should be structured in a simple way that the respondents understand for quick and accurate response. Respondents also needed to be made aware of the purpose of the research wherever possible, and were told how and when they received feedback on the findings. Each questionnaire was developed to address specific objectives, research questions and/or hypothesis of the study.

### **Data Analysis Techniques**

Data analysis is a body of methods that help to describe facts, detect patterns, develop explanations, and test hypotheses. It is used in all of the sciences, in policy and all for the basic need in research. Data analysis can be either descriptive or inferential statistics (Kothari, 2014). The data collected from the study was analyzed and made more meaningful so as to be understood by a common individual. This included the summary of the essential features and relationship of data in order to generalize and determine patterns of behavior and particular outcomes. This was established by the use of either descriptive or inferential statistical methods of analysis. Descriptive statistics are used to describe the basic features of the data in a study. They provide simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data they use tables, charts, pies. With inferential statistics, one is trying to reach conclusions that extend beyond the immediate data alone. The organized data was interpreted on account of concurrence to objectives using data analysis tools like the Statistical Package for Social Sciences (SPSS version 25) and Microsoft office to communicate research findings. The descriptive analysis such as frequencies, percentages, mean and standard deviation were used to analyze the data. Inferential statistics such as Pearson correlation and multivariate regression were used to analyze the data. Correlation was used to generate results on the association between the variables while regression was used to generate results in the relationship between the independent variables on the dependent variable. Data presentation formed the basis of virtually every quantitative analysis of data by the use of frequency tables.

### **RESEARCH RESULTS**

The study sought to assess the influence of project team leader on biomedical research projects implementation at Kenya Medical Research Institute (KEMRI). The study found that a primary ingredient in successful project implementation is the style of the leadership in the institution;

complex organizational problems are intriguing; being able to understand others is the most important part of the work; it is the technical skills of project leader that impacts the ability to adequately execute project activities; there is easy engagement in technical operations in execution of project activities within the institution; the project team leaders are empowered to make decisions within their area of expertise; it is usually known ahead of time how the project team will respond to a new idea or proposal; obtaining and allocating resources is an intriguing aspect of my job; it is easy to adapt and conceptualize abstract ideas for adequate execution of project activities and the team leader works hard to find consensus in conflict situations.

The research sought to examine the influence of resource availability on biomedical research projects implementation at the Kenya Medical Research Institute (KEMRI). The study found that there was sufficient and qualified manpower in all biomedical research projects; fund disbursement is timely in all the biomedical research projects; there is timely availing of project equipment for all the biomedical research projects; there is adequate training and simulation for key stakeholders in all the biomedical research projects; there is adequate funding for all the biomedical research projects; there is timely processing of payment to contractors in all the biomedical research projects; there is timely availing of project materials in all the biomedical research projects; there are safe and healthy working conditions for the project team; there is provision of competitive wages and benefits for the project team and all project activities in this institution are addressed in the planned budget.

The study aimed to establish the influence of top management support on biomedical research projects implementation at the Kenya Medical Research Institute (KEMRI). The study found that strategy implementation in the institution is supported by the existing power structure; there is a feeling of ownership of strategies or implementation plans among key leaders; the top management employs guidelines and/or models to guide strategy implementation efforts; there is clear communication of responsibility and/or accountability for implementation decisions or actions; there is a clear understanding of the role of organizational structure and design in the implementation process; there is sufficient leadership mobilization of financial resources to implement strategies; the top management employs incentives to support implementation objectives and there is adequate information sharing between organizational leaders and business units responsible for strategy implementation.

The research aimed at determining the influence of organization structure on biomedical research projects implementation at the Kenya Medical Research Institute (KEMRI). The study found that there are clear lines of authority and accountability; there is use of specialized workforce; authorization resides in a short chain of command or hierarchy of authority; having to coordinate with few departments; there is clear and adequately structured work processes; work groups and units are adequate for implementing; there is decentralized decision making; departmental lines are not jealously guarded and do not serve as impediments to collaboration; there is precise standardization procedure and there is small span of control of work force working with.

The study sought to determine the success of the most recent projects done by the institution. The study found that project monitoring and evaluations was adequate and satisfactory; resource utilization was optimum; the projects were budget compliant; there was timely completion of projects; project outcomes were satisfactorily accepted by all stakeholders; projects are sustainable in the long term; projects have successfully addressed intended beneficiaries needs; project activities addressed objectives outlined in the proposal; projects have met specific organizational objectives and projects directly involved the beneficiaries.

**Table 1: Pearson Moment Correlation Results**

			Biomedical research projects implementation	Project Team Leader	Resource Availability	Management Support	Organization Structure
Biomedical research projects implementation	Pearson Correlation	1					
	Sig. (2-tailed)						
Project Team Leader	Pearson Correlation	.744	1				
	Sig. (2-tailed)	.041					
Resource Availability	Pearson Correlation	.992	.755	1			
	Sig. (2-tailed)	.009	.023				
Management Support	Pearson Correlation	.965	.707	.963	1		
	Sig. (2-tailed)	.013	.034	.006			
Organization Structure	Pearson Correlation	.537	.947	.547	.491	1	
	Sig. (2-tailed)	.027	.008	.021	.004		

Correlation is significant at the 0.05 level (2-tailed).

The analysis of correlation results between the biomedical research projects implementation and project team leader shows a positive coefficient 0.744, with p-value of 0.041. This indicates that the result is significant at 0.05 and that if the project team leader increases it will have a positive impact on the biomedical research projects implementation. Similarly, the correlation results between resource availability and biomedical research projects implementation indicate that correlation coefficient is 0.992 and a p-value of 0.009 which significant at 0.05.

The results also show that there is a positive association between management support and biomedical research projects implementation where the correlation coefficient is 0.965, with a p-value of 0.013. Also, there was a positive association between organization structure and biomedical research projects implementation where the correlation coefficient is 0.537, with a p-value of 0.027. Therefore, the positive relationships indicate that when the practice of the aforementioned factors is in place, the levels of biomedical research projects implementation increases.

Overall, resource availability had the greatest influence on biomedical research projects implementation at the Kenya Medical Research Institute, followed by management support, then project team leader while organization structure had the least influence on biomedical research projects implementation at the Kenya Medical Research Institute. All variables were significant as their p-values were less than 0.05.

## **CONCLUSIONS**

The study concludes that implementation of biomedical research projects and project team leader have a positive correlation. The study deduced that project leadership influences project success and requires a mixed range of expertise to support various agencies working together effectively; it also requires shared leadership, logistical management and political support to collectively achieve the necessary objectives.

The study also concluded that resource availability has a strong and positive influence on implementation of biomedical research projects at the Kenya Medical Research Institute. The study further concluded that all the factors critical to resource availability have huge influence on the effectiveness in project implementation of health projects. These include expenditure accountability as the most critical factor in securing funding and consequently the realization of effective project implementation. The study concludes that other factors that influence resource availability include; disbursement timeliness, organization submission timelines and standards of liquidation, protocols, organization capacity and bureaucracy.

The study concludes that top management support influences implementation of biomedical research projects positively. Also, it was concluded that top management support forms the heart of administrative support towards project implementation. When top management is unfavorable, the intention to leave increases and when it is favorable, intention to leave decreases. Hence, enhancing staff motivation.

The study concludes that organization structure has a positive but insignificant influence on implementation of biomedical research projects. The study concluded that organization structure plays a very critical role in ensuring that the project implementation runs smoothly devoid of any institutional barriers that can be attributed to the organizational administration.

## **RECOMMENDATIONS**

The study recommends that the government and government agencies with the help other central government agencies and the ministry of health should put in place measures that would ensure health grants from international governments are utilized for the implementation of intended biomedical research projects. Further, the government and government agencies with the help of anti-corruption agencies should combat corruption to ensure revenue from local taxation is appropriately utilized to implement health care projects for the provision of health care services at the county level. The government and government agencies should also encourage

benchmarking trips amongst the implementers of the biomedical research projects and further enhance performance evaluations and appraisals to motivate its employees.

The study further recommends that management in biomedical research projects should ensure that they employ and deploy qualified and competent individuals for project monitoring processes and implementing activities. In addition, they should employ monitoring/supervision mechanism, to allow efficiency in project implementation. The study recommends that project management teams should enhance stakeholder participation to ensure customer satisfaction and ownership of the projects. The study recommends that project staff should be motivated by incentives such as bonuses on their salaries.

The study recommends that organizations that offer health services and conduct health projects should strengthen up their monitoring and audit systems on resource management. This was critical as it helped in keeping up high standards for resource accountability which was the perquisite in raising stakeholder confidence in offering more funds.

The study recommends that capacity building be the central factor before the commencing of a particular project. This project leadership should take charge in ensuring that every phase of the whole project have adequate personnel, whom have the operational pedigree to deliver on their duties as assigned in different phases of the project.

Fundraising leaders and resource mobilization teams should consider the financial resources needed to finish the project and match this with the project design and work plans. This will help eliminate the potential of discontinuing the project for lack of resources. Project managers must build contingency monitoring so that interventions are preferably on or under budget and with a minimal number of problems along the way. The local resource mobilization should be enhanced to shield the projects from shifting foreign donor priorities.

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