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# Priority setting for biomedical research including Covid-19 in the northeastern part of Iran

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ABSTRACT

**Background:** Appropriate priority setting in public health and biomedical research is crucial to make decisions for resource allocation and prioritizing the projects. We studied the research gaps and identified priorities for biomedical research in Sabzevar University of Medical Sciences (SabUMS), located in Sabzevar city in the northeastern part of Iran.

**Materials & Methods:** we used both qualitative and quantitative approaches to determine the public health problems and health research priorities.The processes for priority setting included preparation, problem finding, idea generation, data cleaning and statement development, ranking, and dissemination. We used qualitative research and quantitative surveys for problem findings. We organized two workshops with researchers and public health authorities of Sabzevar city for idea generation, defining criteria for priority setting, and ranking of the research ideas. We used national and international recommendations to prepare a list of research priorities in the region for COVID-19.

**Results:** The criteria for priority setting were concerns of the community, magnitude, and urgency of the problem. In addition, feasibility, the possibility of regional and international research collaboration, and the availability of the infrastructure and capacity to conduct research were used for ranking. The final list of priority areas for research in SabUMS included non-communicable diseases, mental health, drug abuse, accidents, and nutrition respectively. COVID-19 was considered a separate area for research.

**Conclusion:** Experience from this study and follow-up reports would provide best practices in research development in low-resource areas and pave the way for evidence-based public health practice.

**Keywords: COVID-19, Health Priorities, Iran, Priority Setting**



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## INTRODUCTION:

Appropriate priority setting in public health research is crucial to make decisions for resource allocation and prioritizing the research projects that would improve population health [1, 2]. In spite of a higher burden of different diseases in low and middle-income countries, investment in research is poor in these regions. The well-known 90/10 gap indicates that less than 10 percent of the research budget has been spent on the diseases that are responsible for 90% of the disease burden [3].

Although several methods for priority setting exist, it is important to choose an appropriate method in each situation [4,5]. Researchers, suggest using mixed methods and combining qualitative and quantitative methods for priority setting in the research [6,7], and inter and interpectoral collaboration is recommended [8]. Although several studies were conducted in Iran and reported priorities for research at the national level [9], adaptation is required for implementation at the regional level, because the public health problems and research gaps might be different in different geographical regions, especially in a large country like Iran, where the socioeconomic status, disease pattern, and public health problem are variable in different provinces [10, 11].

Most of the studies reported national priorities for biomedical research in Iran [12-14]. Few studies reported priory setting at the regional level and mostly used a qualitative approach in Iran. Only two regional studies reported research priorities in Tehran [15], and Ardabil [16] provinces which showed significant differences in the research priorities in a large country such as Iran.

We used both qualitative and qualitative approaches to define research priorities in Sabzevar city, located in the Khorasan Razavi province in the northeastern part of Iran, and addressed the public problems and priorities for future research in the region. Results of this project will be the basis for the allocation of research budget and intervention by health authorities in Sabzevar University of Medical Sciences) SabUMS (, which is responsible for research and public health issues at the population level.

## Materials & Methods:

Sabzevar city is located in the northeastern part of Iran. The population size of Sabzevar is 467,000, including 306,000 in urban areas and 161,000 in rural areas. SabUMS is responsible for medical education, research, and healthcare services for the population living in Sabzevar city and its rural areas. Flowchart 1 has summarized the processes for priority setting in this study.

### Step 1, Preparation:

We established the strategy committee for this priority setting including the representatives from different sections of SabUMS and a few researchers nominated by the deputy of research. We also established an executive committee to conduct the priority setting, collect and analyze the data, to finalize the research priorities. We also nominated different stakeholders including healthcare providers, experienced researchers, healthcare managers, and authorities of Sabzevar city to participate in the process of this priority setting.

We also developed study protocols for qualitative and quantitative studies to identify public health problems and research gaps.

### Step2, Problem finding:

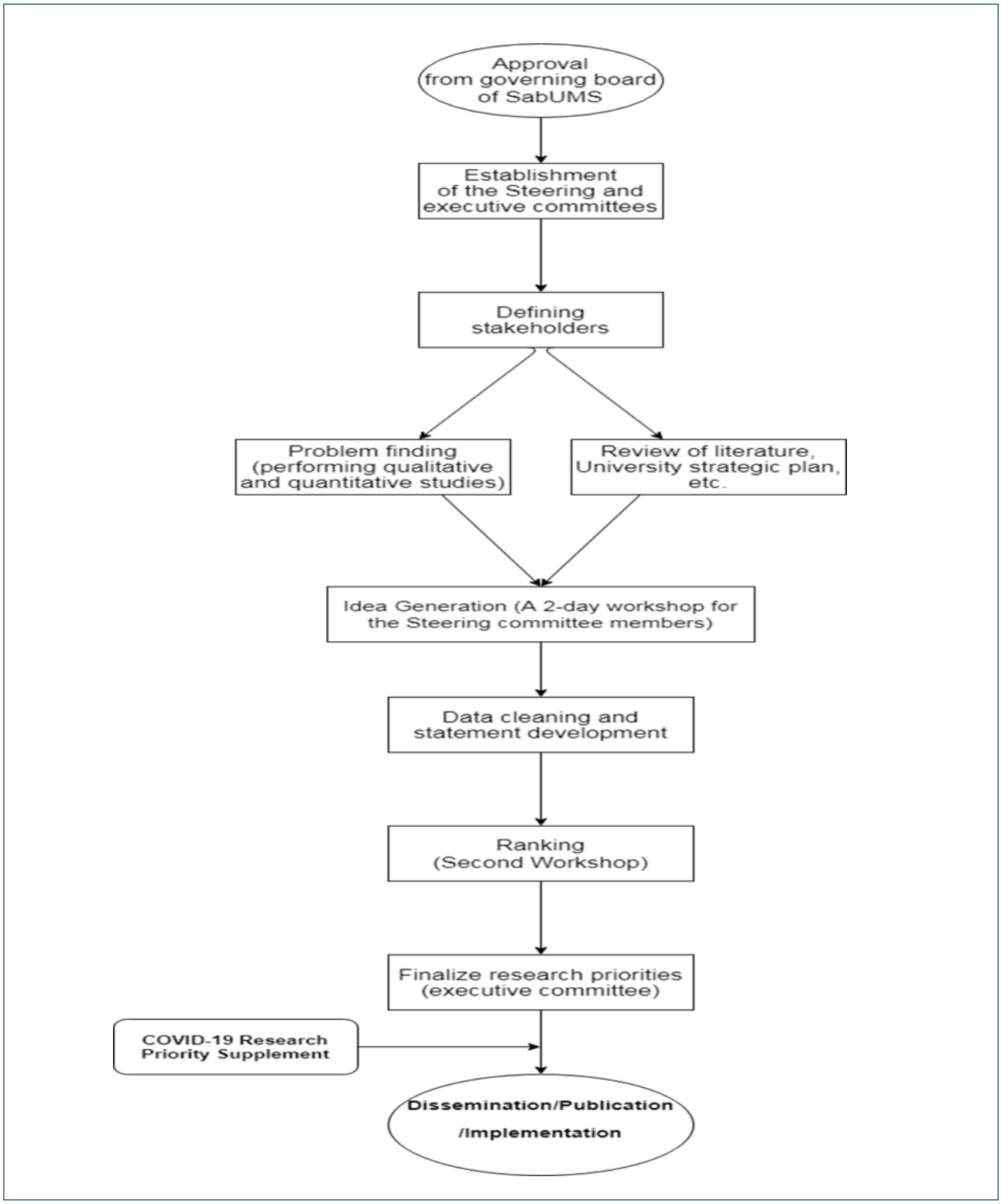
1. Literature review: we reviewed available statistics that were related to the burden of diseases in SabUMS. Also, we checked the latest reports of the national NCDs risk factors survey (STEPS survey). In addition, we reviewed the strategic plan of SabUMS.

2. Conducting Qualitative Study: we conducted a qualitative study and interviewed managers and health care personnel and key stakeholders in the city.

2. Conducting a survey: we collected data about public health issues and problems among the general population through a survey using a structured question. We interviewed 209 people living in urban and rural areas of Sabzevar, Khoshab, and Jovian cities and collected data about public health issues and important public health-related problems they face in their lives using a questionnaire designed by the research group.

### Step 3, Idea generation:

We organized a 2-days workshop for researchers and public health experts working (52 peoples) in different




**Flowchart 1.** The processes for priority setting in the Sabzevar University of Medical Sciences

departments of SabUMS, where we introduced the public health problems and research gaps identified through literature review, qualitative and quantities studies. On the first day of the workshop, the participants used the above data and listed research areas that may respond to these gaps. On the second day of the workshop, we discussed the potential criteria for priority setting. Participants selected the most important criteria setting and ranked them based on their importance (Figure 1). After the workshop, we emailed the reports of the workshop and asked the experts to list research titles that may respond to the above-mentioned gaps. We asked them to list the five most important research topic in each area.

Step 4, Data cleaning and statement development

We reviewed all the topic obtained from the researchers and stakeholders. We also prepared a potential list of the topics based on the literature review. We, then, removed the duplicates and combined them if necessary to decrease the list of research topics.

We prepared a detailed description of each research area, where we described the burden of the problem, incidence, prevalence, and economic impact of the disease or public health problem from the national, international, and local viewpoints. The important research subjects we also shortlisted in each area.

Step 5, Ranking:

We organized additional workshops after few weeks to review the reports and rank the research topics prepared based on previous phases. 30 experts have participated in the second workshop. We presented and presented each research area as a lecture and discussed and the related list of research subjects. After a few modifications, we asked the participants to rank the research areas and corresponding research subjects based on the criteria already set for this purpose. We entered the response from participants and analyzed them using Microsoft Excel and prepared the final list of the research priorities in SabUMS. The final list was also matched with the strategic plan of SabUMS and a few modifications was done accordingly to comply with overall priorities in the university.

**Dissemination:**

We published reports of research priorities for SabUMS

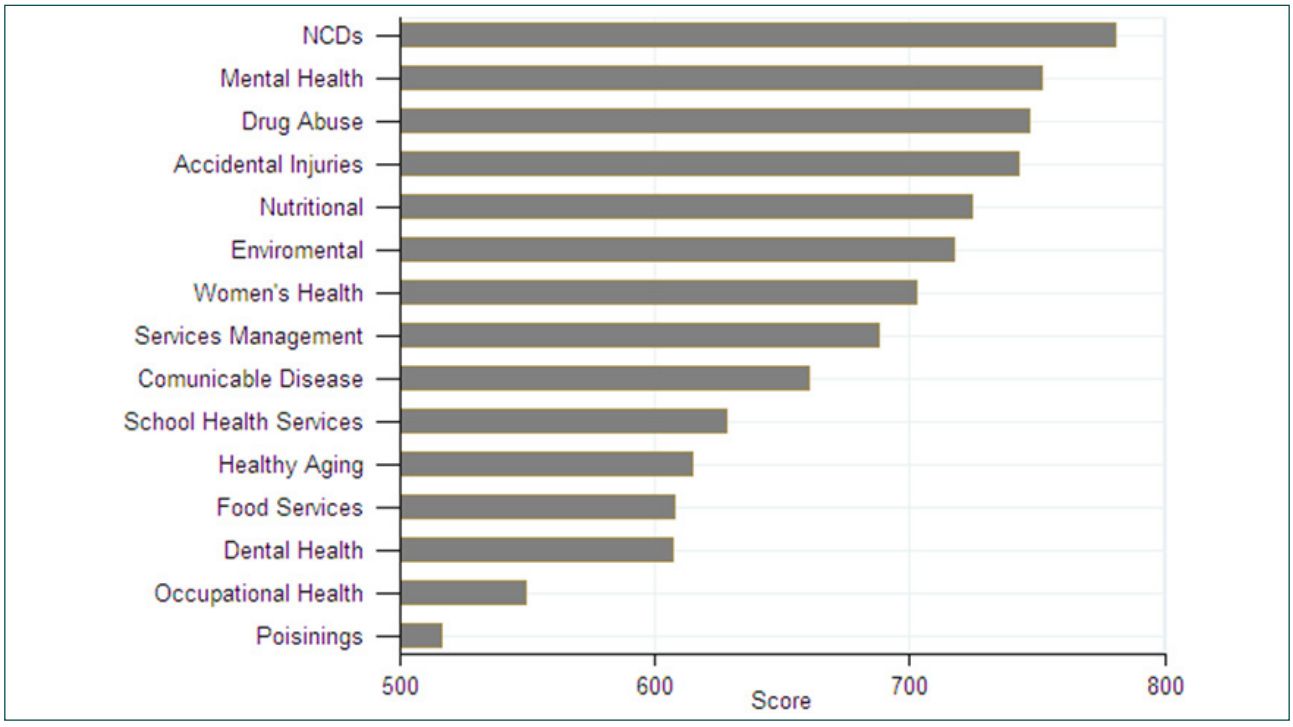



**Figure 1.** Ranking the research priority items in the Sabzevar University of Medical Sciences

disseminated to the stakeholders.

COVID-19 research:

During the preparation of the report, Iran faced an outbreak of the COVID-19. Iran faced a grave epidemic caused by COVID-19 immediately after spreading the disease outside China. From Jan 3rd to October 17th, 2020, assuming as the beginning of the COVID-19 outbreak, 522,387 confirmed cases with 29,870 deaths due to COVID-19 were reported in Iran [17].

Therefore, the steering committee decided to add specific research priorities for COVID-19. After a thorough review of the literature and the national and international list of research priorities, we prepared a specific list of research topics for prevention and control of COVID-19 in SabUMS. The initial list of priorities we reviewed by the committee and the final list was suggested based on the needs and capacities in SabUMS.

## Results:

Based on the STEPS survey, the prevalence of different risk factors was high in the general Iranian population, including overweight and obesity (48%), low physical activity (40%), high cholesterol (28%), high blood pressure (19%), diabetes type 2 (14%), and tobacco smoking (11%). In addition, accident injuries were about 77 death per 100,000 persons in 2015. According to the annual reports of SabUMS, the three top leading causes of death were chronic cardiovascular diseases, cancers, and respiratory diseases respectively.

The final list of priority areas for research in SabUMS included non-communicable diseases, mental health diseases, drug abuse, accidents, and nutrition (Figure1). We also found that concerns on the community, the magnitude of the problem, and available infrastructures for research were the most important criteria for priority setting in SabUMS (Figure 2). However, we ranked the top five research areas from each criterion separately (Table1), indicating that research priorities would vary based on each criterion. While NCDs were the main priority in all criteria, instead, the community was more concerned about the accident injuries. In Table 2, we provided a list of all research priorities for public health problems in SabUMS.

Priorities for prevention and Control of COVID-19 included studies on the magnitude of transmission of COVID-19, epidemiology and risk factors of COVID-19, population intervention for the prevention of this disease, evaluation of the quality of care at the hospitals, research on non-COVID-19 diseases during the outbreak, and role of Non-governmental organizations (NGOs,) in the prevention and control of COVID-19 in Sabzevar city (Table 3).


**Figure 2.** Ranking criteria for scoring the research priorities in the Sabzevar University of Medical Sciences

**Table 1.** Top five research areas from each criterion separately in the Sabzevar University of Medical Sciences

| Criterion | | | | | |
|---|---|---|---|---|---|
| Community concern | Accidental Injuries | NCDs | Mental Health | Nutritional | Drug Abuse |
| Magnitude | Mental Health | NCDs | Nutritional | Environmental | Accidental Injuries |
| Research Capacity | NCDs | Mental Health | Nutritional | Women's Health | Service Management |
| Urgency | NCDs | Mental Health | Accidental Injuries | Nutritional | Drug Abuse |
| Feasibility | NCDs | Nutritional | Service Management | Food services | Mental Health |
| Regional collaboration | NCDs | Nutritional | Mental Health | Drug Abuse | Food services |
| International collaboration | NCDs | Mental Health | Communicable diseases | Women's Health | Environmental |

**Table 2:** Health Research Priorities Ranking in Sabzevar University of Medical Sciences*

| | 1) NCDs |
|---|---|
| 1. | Evaluation of incidence, prevalence of NCDs |
| 2. | Effectiveness of the health promotion programs |
| 3. | Conducting research for early detection of NCDs |
| 4. | Implementing surveillance of disease and studies of risk factors of NCDs. |
| 5. | Assessment of the outcome of NCDs (survival, disability, and quality of life) |
| 6. | Assessment of knowledge, attitude, and practice of general population about risk factors and warning signs of the diseases |
| 7. | Assessment of Quality of diagnosis and treatment services |
| 8. | Improvement of referral system of patients who travel to large cities for diagnosis and treatment |
| 9. | Conducting economical evaluation of NCDs |
| | **2) Mental Health** |
| 1. | Studies on personal skills for training of the children and mitigating risk behaviors |
| 2. | Studies on risk factor and interventions to decrease divorce |
| 3. | Studies on prevalence and risk factors of insecurities, including social, nutritional, economic insecurity |
| 4. | Evaluation of risk factors and burden of vandalism and … among youth. |
| 5. | Studies on Sexual health, and risk behaviors in youth |
| 6. | Studied for improvement of the situation of psychiatric emergencies including suicide |
| 7. | Studies of quality of life in the general population |
| 8. | Evaluation of family issues and environmental risk factors of psychiatric disorders |
| 9. | Studies about misconception and myth about mental health problems. |
| 10. | Access to consultation and diagnostic and treatment services for mental health issues |
| 11. | Assessment of increasing trend of mental health problems |
| 12. | Outcome of immigration from villages |

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| 13. | Access to the outpatient care and impatient care among patients with mental health disorder |
| 14. | Economic burden of medal health disease |
| 15. | Effectiveness of traditional medicine on mental health disease |
| | **3) Drug Abuse** |
| | Alcohol and Opium |
| 1. | Introduction of effectiveness of strategies of prevention and control of drug abuse and alcohol consumption |
| 2. | Studies on knowledge, attitude and practice of general population on drug abuse and alcohol use. |
| 3. | Spiritual wellbeing on prevention of drug abuse |
| 4. | Epidemiological studies on prevalence, incidence, and mortality of drug abuse |
| 5. | Economic studies and providing an effect model for establishment and magnet of the drug abuse control centers |
| 6. | Association of drug abuse and alcohol consumption and risk behaviors |
| 7. | Complicating and side effect of drug abuse and alcohol use for family members |
| Tobacco | |
| 1. | Effective strategies for prevention and control of tobacco use |
| 2. | Epidemiological studies for prevalence and incidence, and risk factors of cigarette and water pipe smoking |
| 3. | Complication of citrate and water pipe use for family members |
| 4. | Health outcomes related to cigarette and water-pipe |
| 5. | Establishing appropriate model for tobacco prevention clinics |
| 6. | Economic impact of cigarette and water-pip |
| | **4) Accidental Injures** |
| 1. | Prevention from motorcycles accidents |
| 2. | Evaluation of pre-hospital care in prevention from mortality and complication in trauma patients |
| 3. | Evaluation of effectiveness of trauma prevention program |
| 4. | Risk factors of trauma events leading to death or disability |
| 5. | Increasing the knowledge, attitude and practice of drivers regarding use of safety tools during the driving |
| 6. | Need assessment of trauma control system in the city (including human resource and equipment) |
| 7. | Assessment and intervention on the quality of hospital care to decrease avoidable death in trauma patients |
| 8. | Assessment of safety tools for old people and children in the houses and working places |
| | **5) Nutrition** |
| 1. | Assessment of diet habits and food intake of people, especially children, elderly, and pregnant women |
| ۲. | Designing Educational program to improve knowledge, attitude, and practice of population regarding healthy diet |
| 3. | Designing a program for healthy diet schools |
| 4. | Assessment of Dietary habit among different patient groups, especially NCD |
| 5. | Design and evaluation of dietary interventions for weight loss among overweight and obese people |
| 6. | Assessment of healthy diet programs in the city |
| 7. | Assessment of dietary support and breast feeding in the city and its association with children health. |

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| 8. | Assessment of ADHD in Sabzevar children and its association with food intake and use of multivitamin during pregnancy and first 2 years of life. |
| | **6) Environmental and public health** |
| 1. | Assessment of Pollutant in the environment |
| 2. | Assessment of Microbial and chemical residues in agricultural products and its relation to use of industrial west water |
| 3. | Research on quality of the drinking water and its potential pollution |
| 4. | Research and Evaluation of the waste management system |
| 5. | Evaluation of waste management system of hospitals and high risk industries |
| 6. | Assessment of wastewater treatment in the rural and urban areas from different sources, especially industries, laboratories, and hospitals |
| 7. | Studies on health impact of inappropriate waste disposal |
| | **7) Women And Children Health Care** |
| 1. | Evaluation of program for disease prevention and mother and children care |
| 2. | Design and implementation of unnecessary caesarian section and increasing normal delivery |
| 3. | Assessment and implementation of the childbearing policy |
| 4. | Study of drug abuse and tobacco and alcohol use among pregnant mothers and its health outcomes in the mothers and their children |
| 5. | Monitoring of mother and infant mortality. |
| 6. | Study of deficiencies of vitamin A.D. Zinc, and Iron among pregnant women |
| 7. | Study of prevalence of weight loss, overweight, and obesity and weight management during pregnancy. |
| 8. | Research for prevention of illegal abortion |
| 9. | Assessment of failure of breastfeeding and self-prescription of milk powder by mothers |
| 10. | Epidemiology and preventive measures of sexual transmitted disease among women |
| 11. | Study of effectiveness of traditional medicine on reproductive health issues |
| | **8) Health Care Quality, Access, and Evaluation** |
| 1. | Evaluation of access to care and its association with health for all indicators |
| 2. | Evaluation of indicators for quality of care and access to health care services (delay time, compliance with standards and guidelines, efficiency of referral system, and patient satisfaction, and etc.) |
| 3. | Assessment of quality of the information system in and electronic health records in SabUMS |
| 4. | Evaluation of human resource in the health care system of SabUMS |
| 5. | Research on population participation in the cost of health care services |
| 6. | Research on patient right and ethical issues related to the healthcare services |
| 7. | Assessment of the indicators for family medicine program in the rural area. |
| 8. | Evaluation of contribution of the private sector in the health care system |
| | **9) Communicable Diseases** |
| 1. | Research for rational use of antibiotics and drug resistance |
| 2. | Assessment of coverage, effectiveness and quality of services for prevention (i.e. vaccination) and management of communicable diseases (including HIV/AIDS, Influenza, Tuberculosis, Leishmaniosis, Rabies, and etc.). |

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|---|---|
| 3. | Study of effectiveness of public education on the prevention and control of communicable diseases |
| 4. | Conducting epidemiological studies for communicable disease (including HIV/AIDS, Influenza, Tuberculosis, Leishmaniosis, Rabies and etc.). |
| 5. | Monitoring of hospital infection control system |
| 6. | Economic evaluation of communicable disease and cost-effectiveness studies |
| **10) School Health Services** | |
| 1. | Evaluation of the Healthy school program |
| 2. | Assessment of effectiveness of supportive program for deficiencies of iron, iodine, vitamin D, and etc. in schools |
| 3. | Assessment of the disease surveillance and mental health problems in school children |
| 4. | Evaluation of quality and effectiveness of educational programs for puberty health in schools boys and girls |
| 5. | Need assessment of elderly people about access and support of elderly people from general health care service, mental health, disability, diet, and oral health |
| **11) Healthy Aging** | |
| 1. | Evaluation of effectiveness of traditional and alternative medicine on elderly health |
| 2. | Evaluation of fractures and its management among elderly people |
| 3. | Situational analyses and intervention models for improvement of the quality of life in elderly people. |
| 4. | Assessment of association between fall and polypharmacy among elderly people |
| 5. | Assessment of risk factors and management of disorders and disease among elderly people |
| 6. | Situational analysis and developing proper model to increase physical activity in elderly people |
| 7. | Assessment of sleep disorders and access to treatment in elderly people |
| 8. | Association between pathologic fractures and use of medical supplements in elderly people |
| **12) Food Services** | |
| 1. | Assessment of foods including dairy products from physical, chemical, and infections in the city |
| 2. | Research on decrease of excess use of salt and fat in the restaurants and food industries |
| 3. | Assessment of health status of personnel's food industries, restaurants, and other staff in the food supply chain |
| 4. | Evaluation of the quality and effectiveness of actions on improvement of healthy food supply |
| 5. | Evaluation of situation and risk of slithering of domestic animals in the public places and houses |
| 6. | Evaluation of the quality of interventions to improve oral health in Sabzevar |
| **13) Dental Health Services** | |
| 7. | Assessment of oral health in the special groups, including children, elderly people, pregnant women |
| 1. | Economic evaluation of the oral health |
| 2. | Study of oral health and different diseases, including diabetes, cancers, cardiovascular disease |
| 3. | Evaluation of the standards of existing dental care and access to the special services for general public in Sabzevar |
| **14) Occupational health** | |
| 1. | Assessment of Exposure to Occupational risk factors in the workplaces |
| 2. | Assessment of the preventive measures from exposures to occupational risk factors |

| | |
|---|---|
| 3. | Assessment of farmers exposure to pesticides and fertilizers |
| 4. | Economic Evaluation of health outcome due to occupational exposures |
| 5. | Improving occupational surveillance system in Sabzevar city |
| 6. | Evaluation of workplace hazards and heaty life-style |
| 7. | Workplace health hazards evaluation to decrease the exposure to occupational risk factors |
| 8. | Assessment of effectiveness and cost-effectiveness of ergonomic interventions to decrease the risk of musculoskeletal disorders in the high risk industries |
| 9. | Research on job related stress in the high risk occupations |
| | **15) toxicity** |
| 1. | Epidemiological studies on toxicity and its risk factor in Sabzevar |
| 2. | Studies on knowledge, attitude, and practice in the general population on toxicities and intervention measures for prevention |
| 3. | Evaluation of Suicide due to toxicity |

**Table 3.** Research priories for prevention and control of COVID-19 in Sabzevar city

| | |
|---|---|
| 1. | Mode and magnitude of the transmission of COVID-19 in Sabzevar city and rural areas |
| 2. | Epidemiology and risk factors of COVID-19 in Sabzevar population |
| 3. | Interventions to prevent the COVID-19 outbreak at the population level |
| 4. | Assessment of the quality of care provided for COVID-19 patients |
| 5. | Studies on Non-COVID-19 diseases (prevention, diagnosis, treatment, and etc.) during the COVID-19 outbreak |
| 6. | Role of non-governmental organizations and of general public on the prevention and management of the COVID-19 outbreak |

## Discussion:

We reported 15 areas for research priorities in Sabzevar city including research topics for COVID-19. Except for COVID-19 which is an urgent problem and requires immediate research, top priories for research were non-communicable diseases, mental health, and drug abuse. The most important criteria for research priories were problems reported by the general population and community, magnitudes of the problem, and the capacities and opportunities for research at the university and national levels.

Non-communicable diseases (NCD) considered the top priority in this study which was similar to the study conducted at the national level and defined as the most public health priority at the national level in 2016 [11]. In addition, NCD was considered as the most important research priority in other regions including Kerman [18] and Ardabil province [16]. DALY for NCDs increased from 42% in 1989 to 74% in 2014 in Iran which is larger than the average increase in the world [19].

Mental health and drug abuse were also the second and third priorities for research in Sabzevar city. Based on the national study for the burden of disease in Iran, ranks of DALYs for these problems, increased from rank 9 in 1989 to rank 3 in 2015 for males and from rank 8 in 1989 to rank 5 in 2015 for females [19]. Specific attempts were made to set up research priorities for mental health issues in Iran [20, 21] where the investigators use the approach suggested by the World Health Organization (WHO)[22].

In this study, public needs and the concerns raised by the community were considered as the most important criteria for the priority setting and conducted a survey to collect data for public health problems from the general

population. In fact, these criteria were used for the first time for priority setting in biomedical research in Iran and followed the standard recommendations for priority setting [9, 23]. In Ardabil study, investigators used the frequency of the problem, mortality, and disability, sustainability of the problem, and political will for intervention at the regional level [16].

In spite of several strengths and using both qualitative and quantitative approaches for research priorities, we faced some limitations. Some of the health managers did not participate in the project and their absence may affect the introduction of the research gaps and priority setting. However, as we applied multiple sources of data to decrease the risk of bias should be minimal. As this was the first attempt to define research priorities in SabUMS, the experience, and knowledge of the managers in this area were limited, implementation of the results from this study is still challenging and intervention in the research administration and use of the evidence at the public health level.

Important action taken by the health authorities was established of NCD research center and leishmaniosis research center in SabUMS. However, it is still in the initial phase and requires a clear action plan to respond to the defined gap and research priorities and create evidence for interventions and improvement of the public health situation. We suggest a regular review of research priorities by the research council, allocation of a specific budget for these priorities at the university level, seeking collaboration with other research centers at the regional and national level, human resource development for the priority areas, and cross-talk with health authorities to implement the research findings at the population level.

Implementation of the research priorities has been challenging [4]. We suggest research administration of the SabUMS, appreciate the results of this project and its implementation at all levels. Chancellor of the SabUMS consider it in the university plan and support it by any means to reach the objectives defined. Experience of SabUMS from this project and report of achievements may promote other Universities in Iran to define their own specific priorities and promote their researchers to work under the defined priorities at the local level.

As priority-setting should be a dynamic process, we quickly responded to the COVID-19 outbreak and included a list of COVID-19 research areas among the list of research priorities of SabUMS. COVID-19 is the most important public health problem everywhere in the world [24] and that treats the lives of people in the urban and rural area. Researchers and findings should immediately respond to these needs and priories and prepare to report the evidence for policymaking in SabUMS. The results may also be applied to other cities, regions that are similar to Sabzevar city. The lesson learns from such a small area may even be useful to other countries.

## Conclusion:

We applied a systematic approach and mixed methods for the priority setting and provided a list of top priorities for research in SabUMS. The most important criteria for priority setting were the concerns of the Sabzevar community, the magnitude of the problem, the urgency, and the feasibility of the research. The priority setting committee added a supplement for research on COVID-19 as the most urgent need at the global, national, and regional levels. Experience from this study and follow-up reports would provide best practice in research development in low resource areas and pave the way for evidence bead public health practice.

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