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Assessment of Devices and mitigating measures during the Covid 19 Pandemic

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Abstract

The studies on survey of devices and mitigating measures during the COVID 19 Pandemic aimed to produce quality washable face masks and face shields and to distribute the same to the Local Public, faculties and students of Muzaffarnagar city by Shri Ram College. Methods and processes like sewing of washable face masks using microshine fabric, printing of logo of funding agency and implementing agency, disinfection process of exposing to direct sunlight and packaging prior to distribution were done for production and distribution of face masks. For face shields, the methods and processes are the following: crafting of face shield using foam, garter, double sided tape and plastic acetate, sticking of logo and packaging of the product prior to distribution. Proper coordination with the Chairman in Shri Ram College, Muzaffarnagar and setting of schedule was considered prior to the distribution of mitigating devices. Representatives of each SRGC were gathered during the schedule through coordination with Association of SRGC Chairmen for the distribution. Based on evaluation of the recipients on the product, both washable face masks and face shields were rated excellent as to quality of material, appropriateness of material, design and craftsmanship. It is therefore recommended that the concept of the project will be embedded in the curriculum and in the College Extension Program to ensure sustainability.

Keywords: COVID 19, Devices Mitigating, Washable Face Mask, Non washeble Face shield

Introduction

Shri Ram Group of colleges is an group of institutions located at Prikarma Marg, Muzaffarnagar. Muzaffarnagar is one of the district of Uttar Pradesh, India. Muzaffarnagar is located at northern part of Uttar Pradesh. The district of Muzaffarnagar forms a portion of division Saharanpur, and situated in the DOAB of the Ganges and the Jamuna, between the districts of Meerut on the South and Saharanpur on the North. On the west, the Jamuna separates it from the Panipat and Thaneswar tahsil of the Karnal district of Haryana; and on the east the river Ganges forms the boundary between this district and the Bijnor tahsil of the district of same name.

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It is roughly rectangular in shape, lying between north latitude 29º 11' 30" and 29º 45' 15" and east longitude 77º 3' 45" and 78º 7'. The greatest length of district from east to west is sixty-one miles, and its greatest breadth from north to south thirty-six miles. The average length and breadths are about fifty-three and thirty-one miles, respectively. The total area in 1901 amounted to 1,963,662 acres, or 1,662 square miles and in 2000 amounted to 4049 square k.m.. The district is well connected by road and railway network. National Higway-58 passes through Muzaffarnagar city. Upper Ganga & Lower Yamuna canal lie in this district.

Thus, this project intends to supplement the needs of our Local Public, Faculties, students and community in terms of protection from COVID-19 infection. With the production of the protective devices and equipment, the needs of Faculties will be easily addressed. Local communities will also be helped through distribution of face masks to marginalized individuals who has no capacity to purchase the said gear. Furthermore, SRGC is a unique state college with a custodial care program. The CCP has plantilla sewers and sewing machines which makes us capable of producing face masks. Aside from this, BTLE program and ICT has lab facilities which can be used in the production of face shields.

Table 1. Logical Framework

Project Summary	Indicators	Means of Verifications	Assumptions
Outcome(S): Protect Faculties and community against Covid 19	Supplement the needs of Faculties and checkpoint areas in Shri Ram College, Muzaffarnagar	List of received face mask and DIY face shield.	Acceptability of Faculties and community
Output(S): Functioning face mask and DIY face shield	Number of face mask and DIY face shield	Photo documentation of fabricated materials	Adequacy of protective materials produced
Activities: Production of face mask and DIY face shield	Fabricated face mask and DIY DIY face shield	Total number of face mask and DIY face shield materials produced	Availability of materials within the Province of Muzaffarnagar
Distribution of face mask and DIY face shield to Faculties in College of Law	Distributed face mask and DIY face shield to Faculties of College of Law	List of face mask and DIY face shield distributed to different recipients	Sufficiency of face mask and DIY face shield.

Objectives

This project entitled Mitigating Measures and Devices: Addressing COVID 19 Pandemic aimed to:

1. Produce washable face masks and face shields for the Local Public, faculties and students of Muzaffarnagarcity by Shri Ram College.
2. Distribute quality washable face masks and face shields to the Faculties, community and students in Shri Ram College, Muzaffarnagar.
3. Evaluation of the quality of face masks and face shield produced through client feedback.

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Table 2. Beneficiaries

Target Beneficiaries (Muzaffarnagar)	Face Mask	DIY Face Shield
Bhagirati Chowk, Muzaffarnagar	8,485	2,521
Tiket Chowk, Muzaffarnagar	3,939	1,385
Reshu Chowk, Muzaffarnagar	7,576	2,294
Shri Ram Group of Colleges	10,303	2,976
Almashpur Chowk, Muzaffarnagar	9,697	2,824

Materials and Methods

(method of production and distribution, implementation strategies, including safety and QA practices employed)

Coordination with the Chairman was done as to the needs of the Faculties especially in mitigating the social, economic and financial impact of COVID-19. With this, the items mentioned above were identified. Face masks and face shields will be extended to identified Faculties of Shri Ram College, Muzaffarnagar (College of Law, College of Pharmacy, Shri Ram College and College of Home Science) in the province of Muzaffarnagar. The project will ensure involvement of the Faculty for the sustainability of the project. Below are the different methods of the project.

Production of Face Masks

In addition to social distancing and frequent hand washing, every individual if possible is encouraged to wear a face mask to slow down the spread of virus. Yet, supplies of medical-grade masks are already scarce and are reserved for health-care workers who had been exposed to huge amount of virus. Knowing the virus is extremely tiny, the face masks that will be produced and made out of silk or pongee and microshine fabric as recommended by a group of doctors. These type of fabric able to trap tiny particles and balance breathability. Two 9" x 6" and 7.5" x 5" dimensions of the fabric will be cut, putting it together in its right side. The first corner of the fabric will be sewed by starting at the center of the bottom edge, then, the elastic will be sewed with the edge out into the corner. To the next corner, the other end of the same elastic will be sewed and brought to the corner and sewed again. Then, from the top of the mask to the next corner, it will be sewed again and an elastic with an edge out will be added. The next corner will then be sewed with the other end of the same elastic leaving about 1.5" to 2" open. Thread will be added, turning inside out. Then, three tucks of the same direction will be pinned on each side of the mask and the edge of the mask will be sewed twice.

DIY Transparent Face Shield

The material that will be used for face shield is 0.25mm – 0.30mm acetate sheet. According to Roberge (2016) in his review on face shields for infection control, acetate provides the best clarity. First, all the materials will be prepared. The foam/insulator will be cut with a dimension of 12 in x 1.5 in x 1 in. Then, it will be attached to the longer side of the acetate sheet using a double-sided tape, pressing down on the foam to ensure firm adhesion. Then, two holes will be punched on each side of the plastic sheet, slightly below the foam. The garter will then be inserted in the holes, double tying them inside the shield to prevent from slipping and making sure that the garter and foam are aligned. Then, the edges of the plastic sheets will be cut into a rounded shape. Lastly, the shield will be kept flat so the user can freely adjust it for a snug fit.

Distribution and Monitoring Plan

Monitoring scheme will be implemented to ensure that face mask and face shield reached the target beneficiaries. Prior to distribution, masterlist of Faculties will be secured through coordination with partner Principal within Shri Ram College, Muzaffarnagar. Based on the list, face mask and face shield will be packaged based on the target number. Facemask will be bundled by 100's and face shield will be bundled by 10's to limit time during distribution and minimize social exposure. Each bundle will be accompanied by acknowledgement receipt a feedback form. Acknowledgement receipt will be signed by the receiver and will be collected to serve as proof

that project outputs reached the beneficiaries. The Chairman for Research, Development and Extension and the Director for Extension will monitor the distributed products monthly by collecting the feedback form to ensure that it reached the target beneficiaries and to gather feedback for the improvement of the project.

Results and Discussion

Production of Face masks

The first corner of the fabric was sewn by starting at the center of the bottom edge, then, the elastic was sewn with the edge out into the corner. To the next corner, the other end of the same elastic was sewn and brought to the corner and sewn again. Then, from the top of the mask to the next corner, it was be sewn again and an elastic with an edge out was added. The next corner was sewn with the other end of the same elastic leaving about 1.5" to 2" open. Thread was added, turning inside out. Then, three tucks of the same direction was pinned on each side of the mask and the edge of the mask was sewed twice.

Printing of Logo

To emphasize identity of the funding agency and implementing agency, a logo on one side of the masks was printed. This was also a means of promotion of the government agencies who have shown welfare for the Faculties amidst COVID 19 Pandemic.

Disinfection process

Disinfection of the face masks was also done prior to packaging. This is to ensure that the face masks to be distributed were free from pathogens or disease-causing microorganisms. Since there is no available disinfection equipment available in the implementing agency, The project team practiced the most energy-saving means of disinfection. Face masks were exposed to direct sunlight for 8-10 hours.

Packaging of Face masks

For efficient distribution of mitigating devices to Faculties, face masks were packed prior to distribution. Each bundle has 100 pieces of face masks. After bundling, appropriate number of face masks intended for each SRGC were packed in a plastic bag together with the face shield. This practice limited the time exposure with the public and considered adherence to the protocol of social distancing.

Production of Face shields

The material used for face shield is 0.25mm – 0.30mm acetate sheet. According to Roberge (2016) in his review on face shields for infection control, acetate provides the best clarity. First, all the materials were prepared. The foam/insulator was cut with a dimension of 12 in x 1.5 in x 1 in. Then, it was attached to the longer side of the acetate sheet using a double-sided tape, pressing down on the foam to ensure firm adhesion. Then, two holes were punched on each side of the plastic sheet, slightly below the foam. The garter was then inserted in the holes, double tying them inside the shield to prevent from slipping and making sure that the garter and foam are aligned. Then, the edges of the plastic sheets was cut into a rounded shape. Lastly, the shield will be kept flat so the user can freely adjust it for a snug fit. Figure 4 shows the produced face shield with CHED and CFCST seal at the right upper corner of the plastic acetate.

Packaging of Face Shields

For efficient distribution of the mitigating devices to target beneficiaries, face shield were packed by bundle of 50 pieces. After bundling, appropriate number of face shield intended for each SRGC were packed in a plastic bag. This practice limited the time exposure with the public and considered adherence to the protocol of social distancing.

Distribution of facemasks and faceshields

Distribution of mitigating devices such as face masks and face shields were done through proper coordination with the Local Government Unit(LGU). Representatives of each SRGC were gathered during the schedule through coordination with Association of SRGC Chairmen (ABC) president for the distribution.

Distribution at Tiket Chowk, Muzaffarnagar Muzaffarnagar

A total of 3,939 face mask and 1,385 face shield had been distributed in Tiket Chowk, MuzaffarnagarMuzaffarnagar during the ABC meeting held on December 4, 2020. The Brgy. Captains and other representatives of the 13 SRGCs received the said face mask and face shield in a bundle to prevent mass contact with the community beneficiaries.

Distribution at Shri Ram College Muzaffarnagar

Figure 6 shows the distribution of covid 19 mitigating devices in Shri Ram College Muzaffarnagar undertaken in the Municipal Gymnasium of Shri Ram College last December 14, 2021 with a total of 10,303 face mask and 2,976 face shield distributed and received by the different brgy. Captains and other representatives during a special meetings requested for the purpose.

Distribution at College of Engineering Muzaffarnagar

A total of 7,576 face mask and 2, 294 face shield were distributed to brgy captains/officials and other representative of each SRGCs during the ABC meeting called by the College of EngineeringABC President last February 5, 2021 held at Municipal Session Hall, Poblacion, President Roxas, Muzaffarnagar.

Distribution at Almashpur Chowk, Muzaffarnagar Muzaffarnagar

The CFCST Extensionists had distributed a total of 9,697 face mask and 2,824 face shield among representatives of the 32 SRGCs of Almashpur Chowk, MuzaffarnagarMuzaffarnagar during the Sangguniang Kabataan seminar held at the ABC Hall last February 9, 2021. Representative of each SRGCs received the Covid 19 mitigating devices.

Distribution at College of Law Muzaffarnagar

The distribution of face mask (8,485 pcs) and face shield (2,521 pcs) pack in a bundle in College of Law Muzaffarnagar was done during the ABC meeting of the different SRGC Captains of College of Law and representatives held on February 8, 2021 at the Disaster Risk and Management Hall, Green Field College of Law Muzaffarnagar. Figure 9 shows the posts of Extensionists with beneficiaries after the distribution process.

Evaluation of the product

After the distribution of the mitigating devices, the recipients were given evaluation form for them to rate and evaluate the product. The evaluation form had a Visayan translation for easy comprehension for some recipients who were not able to understand English. Based on evaluation of the recipients on the product, washable face masks were rated excellent as to quality of material (9.03), appropriateness of material (9.03) , design (9.24) and craftsmanship (9.21) with an over-all mean of 9.13 which also means excellent.

Facemasks' criteria, mean and description.

Criteria		Mean	Description
Quality of Material		9.03	Excellent
Appropriateness of Material		9.03	Excellent
Design		9.24	Excellent
Craftsmanship		9.21	Excellent
Grand Mean		**9.13**	**Excellent**

Legend:
8.21-10.00-Excellent
6.41-8.20-Very Good
4.61-6.40-Good
2.81-4.60-Fair
1.00-2.80-Poor

Based on evaluation of the recipients on the product, face shields were rated excellent as to quality of material (9.09), appropriateness of material (9.12) and crafts man ship (9.18) with an over-all mean of 9.13 which also means excellent.

Face shields' criteria, mean and description

Criteria	Mean	Description
Qquality of material	9.09	Excellent
Aappropriateness of material	9.12	Excellent
Crafts man ship	9.18	Excellent
Grand Mean	**9.13**	**Excellent**

Legend:
8.21-10.00-Excellent
6.41-8.20-Very Good
4.61-6.40-Good
2.81-4.60-Fair
1.00-2.80-Poor

Potential profitability

The project had a potential profitability specially on face masks. Based on the feedback of the recipients, they are willing to spend face masks from 25-30 pesos when sold commercially. However, most of them responded that they are willing to buy face shield from 21-25 pesos when sold commercially. This could be attributed to the fact that low cost face shields are available commercially in the same range of price.

Chart 1. Major Output/Accomplishment (expected output/outcome vs. actual output/outcome)

Target/Expected Output	Actual Output
Production of face mask and DIY face shield	Produced face masks and face shield with logo of funding agency and implementing agency
Distribution of face mask and DIY face shield to Local Public, faculties and students of Muzaffarnagarcity by Shri Ram College	Distributed 40,000 of face masks and 12,000 face shield to target beneficiaries

Issue and Challenges (problems encountered during the implementation of the project)

In the midst of COVID 19 Pandemic, exposure to public is restricted and social gatherings were also limited. The project team encountered problems on the schedule of distribution and the availability of BLGU officials who will received the mitigation devices.

In addition, financial problems were inevitable. The project team also encountered the problem on delayed fund disbursement due stringent requirements on financial matters

With the limited resources of the implementing agency as to transportation equipment, the project team also encountered the problem on unavailability of transportation vehicles to be used during the distribution of mitigating devices. Given that not all roads in Shri Ram College, Muzaffarnagar were concrete added with mountainous topography, transportation vehicles which can outgo the craggy roads were needed.

Problems on communication due to poor signal were also encountered in the implementation of the project. Some BLGU officials cannot be reached through mobile phones and electronic mail due to poor or no signal at all.

Recommendations (action taken and recommended actions to improve future project implementation)

Action taken

Considering the problems encountered during the implementation of the project, the following actions were taken:

Project team distributed the mitigation devices during the ABC meeting of the SRGC officials to limit exposure to public and to minimize time and effort of distribution.

The project team asked consideration from the suppliers of materials to allow part-cash, part-charge on payment just to continue the production of facemasks and faceshields.

The project team used personal vehicles during the distribution of mitigating devices.

The project team personally deliver communication letter to target beneficiaries.

Recommendations

Based on the results of the project and given the potential profitability on face masks production, it is recommended that production of face masks will be continued and sustained.

It is also recommended to include in the criteria the filtration ability of the face masks since it was not included in the actual evaluation of the product during the conduct of the project.

Sustainability Plan (actual/perceived impact of the project, proposed future utilization/dissemination and continuity of the project)

The project had a potential profitability specially on face masks. Based on the feedback of the recipients, they are willing to spend face masks from 25-30 pesos when sold commercially.

To ensure the sustainability of the Project, the following measures could be adopted:

Project shall be embedded in the curriculum

When the regular classes resumes, Personal Protective Equipment (PPE) making shall be embedded in the instruction especially in Technology and Livelihood Education and Agri-Business courses. This initiative will eventually lead to skilful students who can make facemask and face shield even on their own community.

Outputs or projects of the students could also be a source of income-generating projects for the college and for individual students as well who will engage in entrepreneurship like online selling of face mask and face shield.

Even on COVID Post-Pandemic era, PPE making could still be continued to supplement the supply

of PPE in hospitals, Rural Health Units and SRGC health units in Shri Ram College, Muzaffarnagar.

Integration in College Extension Program

This project shall also be integrated in College Extension Program to transfer the learning to target beneficiaries in the community like women's organization and out-of-school youth.

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