Master of Science in Medical Plants Research and Drug Development

Comparative Analysis of the Hypoglygemic Potentials of *Morus Alba* L. and *Morus Mesozygia* Staph.

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The genus Morus has been widely reported to have various medicinal properties, most notable of which is their hypoglycemic property. *Morus alba* has been used for centuries in South East Asia in the treatment of diabetes. In this study, we compared hypoglycemic potentials of *M. alba* and *M. mesozygia* and their suitability for consumption, micromorphological comparison, nutritional content, phytochemical screening, antioxidant property and toxicological analysis was also carried out on leaf samples and extracts of *M. alba* and *M. mesozygia*. Hyperglycemia was induced in albino Wistar rats by interperitoneal injection of alloxan monohydrate (150mg/kg). The induced rats were administered daily doses (400mg/kg) of aqueous and methanol extracts of *M. alba* and *M. mesozygia*. The weight and fasting blood sugar levels monitored using a weighing balance and glucometer. The trio of *M. mesozygia* aqueous (73.37%), *M. alba* aqueous (72.2%) and methanol (73.9%) had activity comparatively similar but higher than the activity of the control drug metformin (46.27%) at day 7, while *M. mesozygia* methanol had lower activity (12%) on day 7 but had peak activity (67.3%) on Day 3. Micromorphological comparison showed several similar characteristics in their foliar morphology as common to genus Morus and a notable difference in the type of trichomes found in the individual species. The leaf and leaf extracts of *M. alba* and *M. mesozygia* had high nutritional properties and were safe for consumption given their low toxicity index. This study further justifies the fact that *M. mesozygia* can be used instead of *M. alba* in developing products for the management of diabetes.

Keywords: Hypoglycemia, alloxan, *M. alba*, *M. mesozygia*, Blood sugar, Micromorphology

Wound Healing Activities of Aqueous and Hydromethanolic Extracts of Pleurotus Ostreatus (Jack. Ex. Fr) P.Kum and a Poly-Fungi Formulation

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Wounds of varying degree pose serious discomfort to the associated individuals leading to loss of productive hours and even deaths. The available conventional methods have a lot of adverse effects, some are sophisticated and very costly. There is the need to look for alternative approaches. This study therefore seeks to evaluate the wound healing activities of aqueous and hydromethanolic extracts of Pleurotus ostreatus (POW and POM respectively) as well as a polyformulation (PPT) containing the hydromethanolic extracts of Trametes elegans (TEM), Phellinus baumii (PBM), and POM.
Fruiting bodies of the mushrooms were collected and identified by a mycologist. The samples were sun dried, pulverized to fine powder and cold macerated in 70% methanol

for 72 hours whilst hot water extraction was done for 45 minutes by boiling. The antimicrobial activities of TEM and PBM were determined by the agar well diffusion. TEM, POM and PBM were then combined to form PPT whose antimicrobial activities were in turn determined by the agar well diffusion followed by micro-broth dilution. The antioxidant activities of the extracts POW, POM and PPT were determined by the DPPH radical scavenging assay with ascorbic acid as positive control. The acute anti-inflammatory activities of the extracts were determined by the carrageenan induced edema on the foot pad of the seven-day aged chick using dexamethasone and diclofenac as controls. The extracts POM, POW, and PPT were incorporated into creams of concentrations (1%, 5% and 10%) and the dermal wound healing activities were determined by the excision method using rats with 1% silver sulfadiazine as positive control.

The minimum inhibitory concentration (MIC) value of PPT against test organisms associated with wounds ranged from 100 mg/mL to 25 mg/mL in the antimicrobial studies. For the DPPH radical scavenging assay, the IC50 values of POM, PPT and POW were 884.70, 290.30 and 1974.00 µg/mL respectively. The EC50 of POM, POW, and PPT were 641, 413 and 111.90 µg/mL respectively in the carrageenan induced edema assay, whilst that of dexamethasone and diclofenac were 1.42 and 8.97 µg/mL respectively. All doses of the three extracts demonstrated significant wound healing effect ($P < 0.05$) with chronic inflammation observed with the highest doses. Significant differences between treatment groups (treated and non-treated) were computed using Two-way ANOVA followed by Tukey's Post hoc test or One-Way ANOVA followed by Dunnet test wherever required. The wound healing activity of the medium dose of the polyformulation (PPT) was very much comparable to the 1% silver sulfadiazine ($P > 0.05$).

The observations from this work therefore indicated that mushrooms can be good sources of novel wound healing agents. However, higher concentrations tend to cause chronic inflammation and tissue damage through massive lymphocytic infiltration to the wounded site thus delaying the wound healing process. Optimum concentration is therefore needed to achieve perfect results. Further studies on the polyformulation can lead to marketization/patenting of the product.

Keywords: Wound healing, Mushrooms, Pleurotus ostreatus, Antiinflammation, Antimicrobial, Antioxidant, Trametes elegans, Phellinus baumii, Poly-formulation, Synergistic action

Evaluation of Hepatoprotective Activity of *Erythrina Abyssinica* Dc. Flowers and Stem Bark against Chemical Induced Liver Damage on Animal Model

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The liver is a vital organ for mammals with a wide range of functions in the body, its cells or hepatocytes play major roles as detoxifiers of xenobiotics and producers of energetic

and digestive compounds. Liver damages or liver diseases classified as hepatitis, cirrhosis, hepatocellular carcinoma, remain a big public health problem worldwide in terms of human suffering, hospital visits, and premature loss of productivity. Throughout the ages, Men has been able to rely on nature to provide for their own basic needs: food, shelter, clothing and also for his medical needs. The present study was aimed to assess the hepatoprotective activity of the flowers and stem bark extracts of *Erythrina abyssinica* DC (Leguminosea), plant used to treat liver diseases in traditional medicine.

After collection of different plant materials (flower and stem bark), they were processed and the powder form was subjected to aqueous extraction. Colorimetric, precipitation, gravimetric and spectrophotometric methods were used to carry out phytochemical screening. The flower and stem bark extracts obtained were tested for hepatoprotective activity separately and as a mixture using paracetamol-induced hepatotoxicity model in Guinea pigs. The LD_{50} studies were conducted in Guinea pigs and the brine shrimp lethality assay with the mixed extract of *Erythrina abyssinica*. The hepatoprotective activity was studied in Paracetamol drugs induced hepatoxic animal models. The physical parameters such as liver colour, consistency and texture and biochemical parameters like SGOT, SGPT, ALP, Total Bilirubin and γ-GT and histopathology reports of livers were also considered to confirm hepatoprotection. Analyse of variance followed by Dunnett T3 post hoc test were used with $\alpha_{0.05}$.

Phytochemical screening showed the presence of saponins, alkaloids, flavonoids and tannins in both flowers and stem bark extracts. Other specific components were also detected either in flowers or in the bark. The LD_{50} was found safe up to the dose level of 3662.11 mg/kg *b.w*. confirming its non-toxic nature however the brine shrimp lethality assay revealed a good brine shrimp lethality activity with LC_{50} 33.17 ppm (µg/mL) compared with the standards cyclophosphamide and vincristine LC_{50} 63.82 ppm and 76.65 ppm respectively. Paracetamol induced hepatotoxicity was significantly prevented by pre-treatment with mixture of aqueous extract of *Erythrina abyssinica* DC. Macroscopic observation showed an intact liver with a fatty point but soft and firm on touching. Microscopic analysis showed section of liver parenchyma with intact architecture at the high dose (600mg/kg *b.w.)* and reduction in biochemical parameters levels like serum SGOT, SGPT, ALP, Total Bilirubin and γ-GT after treatment with mixture of aqueous extract of *Erythrina abyssinica* DC confirmed the hepatoprotective effect of extract under study. In liver injury models in Guinea pig restoration of hepatic cells and absence of necrosis after treatment with extract was observed indicating satisfactory hepatoprotection.

Based on improvement in serum marker enzyme levels, physical parameter histopathological studies it was concluded that the mixture of aqueous extract of *Erythrina abyssinica* DC possesses significant hepatoprotective activity in the doses used**.**

Keywords: *Erythina abyssinica* DC, Hepatoprotective activity, Acute toxicity

Evaluation of Aqueous and Ethanol Extracts of Iphionopsis Rotundifolia Leaf for Cytotoxicity, Chromatographic Fingerprinting, Antimicrobial and Antioxidant Activities

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The aqueous extracts of the leaf and root of *Iphionopsis rotundifolia* (Oliv. And Hiern) Anderb (Compositae) is used for managing skin infections and stomach diseases. The cytotoxicity, TLC fingerprinting, antimicrobial and antioxidant activities of the aqueous and ethanol extracts of the leaf were evaluated. Using the cup-plate method different concentrations of the extracts were tested against one Gram-positive (*Staphylococcus aureus*), one Gam-negative (*Escherichia coli*) human pathogenic bacteria and one fungus (*Candida albicans*). The zones of inhibition produced by the extracts were compared with those of reference standards; ciprofloxacin (10 µg/mL) against bacteria and miconazole (10 µg/mL) against the fungus tested. The aqueous extract showed remarkable antibacterial but no antifungal activities against the pathogens tested while the ethanol extract was virtually inactive against the tested microorganisms. An agar-dilution method was used for the determination of Minimum Inhibitory Concentration (MIC), using ciprofloxacin (10 µg/mL) and miconazole (10 µg/mL) as reference standards. Furthermore, cytotoxicity of the extracts was evaluated using Brine Shrimps (*Artemia salina*), which showed that the ethanol extract was toxic while the aqueous extract was non-toxic. DPPH was employed for evaluating the antioxidant activity. Both the extracts showed antioxidant activities but the ethanol extract showed greater activity. The TLC fingerprint experiments on the aqueous extract gave 3 spots with Rf : 0.15, 0.54 and 0.73, respectively while ethanol extract gave 7 spots with Rf : 0.04, 0.33, 0.52, 0.63, 0.69, 0.90 and 0.98, respectively. The 3 TLC spots observed in the aqueous extract, showing pink colouration in daylight after spraying with vanillin-sulphuric at 100 C, were not detected in the ethanol extract. The 3 spots were therefore, considered as the possible antibacterial agents in the aqueous extract while their absence in ethanol extract could explain why the extract was inactive against the microorganisms tested.
Hence, the fact that only the aqueous extract of the plant (as used by Somalis), was found to inhibit the growths of the bacteria tested, should suffice to justify its traditional claim as a therapy for skin infections. The absence of the 3 pink TLC spots in the inactive ethanol extract whereas they are present in the active aqueous extract, will further strengthen the traditional claim.

Keywords: *Iphionopsis rotundifolia*, Antimicrobial, Antioxidant, Brine Shrimp Assay, TLCfingerprinting

Phytochemical Screening, Antioxidant and Antimicrobial Activities Ofurtica Massaica Mildbr. (Urticaceae) Growing in Rwanda

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Oxidative stress plays a pivotal role in human diseases. Antioxidants can nullify the effects of deleterious effect of oxidation. Plant based antioxidants are therefore reducing agents which oxidized to remove the free radical. Antimicrobial resistance has been a growing threat to the effective treatment of an ever-increasing range of infectious diseases caused by microbial organisms. In Rwandan ethnomedicine, *Urticamassaica*(Urticaceae) is used alone and sometimes in mixtures with other plant species to treat numerous ailments: bruises, injuries, fractures, venereal diseases, stomach problems, skin infections, bladder complications, rheumatism, cough, headache, and urethral leak.

The present study aimed at phytochemical screening and determining the antioxidant and antimicrobial activities of *Urticamassaica* a Rwandan medicinal plant. DPPH and FRAP Assay techniques were used and against seven phathogenic bacteria (clinical bacterial isolates *E. coli, Salmonella* spp, *Klebsiella pneumonia, Proteus morganis, Acinetobacter* spp, *Staphylococcus aureus and Streptococcus pyogenes*) were tested. The plant materials (stem and root barks) were collected in February, 2019 from the wild areas surrounding Volcanoes National Park of Rwanda in Nyabihu District, Northern Province, Rwanda. Washed stem and root materials were chopped in pieces, air-dried and grounded into powder. Weighed 270 grams of air dried powder were cold-macerated in 80 % methanol for six days. Methanol solvent was evaporated using rotary evaporator and oven at temperature 40-45^{0}C. The majority of bioactive secondary metabolites were present in stem bark methanol extract (SBME) at higher concentration than in root bark methanol extract (RBME) of *U. massaica*. The study demonstrated that SBME showed higher level of antioxidant activity as compared to the root bark methanol extract in all the methods of analysis. RBME exhibited greater antioxidant properties (radical scavenging activity and ferric reducing capacity) in both techniques performed during this study. The results confirmed the consistency of antioxidant effects of the plant studied in the present project. Among extracts of *U. Massaica* evaluated at concentrations ranging 25µg/mL-400µg/mL, RBME demonstrated poorer maximum scavenging capacity against DPPH (%I of 52.195% at at400µg/mL) comparing with SBME (%I of 75.366% at 400µg/mL). The percentage inhibition of stem bark showed lower values than those of root barks of the studied plant. Among extracts of *U. Massaica* evaluated at concentrations ranging 25µg/mL-400µg/mL, SBME IC_{50}wassmallerthan RBME IC_{50}, while % reducing power of SBME was bigger than that of RBME, therefore, higher antioxidant activity during this study.

This might be attributed to the fact that SBME showed higher quantity of secondary metabolites (Phenols, Tannins, Saponins and Flavonoids) than RBME, hence, leading to the increase of its higher antioxidant effects. This validly confirmed the consistency of antioxidant effects of *Urtica massaica* (Urticaceae) studied .In this investigation, only two-gram-negative bacteria species *(Escherichia coli and Salmonella* spp) and one-gram positive bacterial species (Staphylococcus aureus) were found to be sensitive or

susceptible to both extracts of the evaluated plant. Others were resistant to plant extracts at concentrations 150, 300 and 600 mg/mL. Generally, SBME exhibited greater antimicrobial effects than RBME against the susceptible microbial organisms (Escherichia coli, Salmonella spp and Staphylococcus aureus) in Agar disc diffusion method. **RBME** showed no inhibitory effect at all test concentrations**, while** the SBME at 150 mg/mL concentration also showed no inhibitory effect, thus, Salmonella spp were resistant to RBME. The MIC values and MBC values of stem bark methanol extract were lower than those of root bark methanol extract in all sensitive tested microbial organisms.
These findings indicated greater antimicrobial activities of stem bark than root bark of the studied plant. The stem and root extracts exhibited cytotoxic activity against brine shrimps and thus, supported the presence active or potent components in the plant extract, thus, could be regarded as promising source of antitumor compounds, because their LC_{50} values are less than 1000 µg/mL Meyer's and Clarkson's cytotoxicity criteria. The brine shrimp lethality bioassay performed in this research validly confirmed the antioxidant and antimicrobial activities exhibited by this Rwandan medicinal plant, *U. massaica*. Hence, its stem bark might be taken into account as favourable source of new plant based antioxidant and microbial agents.

Keywords: Phytochemical screening, Antioxidant and Antimicrobial activies, Cytotoxicity, *Urticamassaica* stem and root barks

Antimycobacterial Activity, Cytotoxicity and Phytochemical Screening of Extracts of Three Kenyan Plants: C*ommiphora mildbraedii* ENGL., C*ommiphora edulis* (KLOTZSCH) ENGL. and C*ommiphora ellenbeckii* ENGL.

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Tuberculosis, an air-borne disease is among the ten leading deadly diseases worldwide. Despite the efforts of WHO and its partners to eradicate the disease, it continues to be a public health issue especially with the rise of multi-drug resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB). Among the medicinal plants used in the treatment of infectious diseases in Kenyan ethnomedicine are members of the myrrh genus including *Commiphora mildbraedii* Engl., *Commiphora edulis* (Klotzsch) Engl. and *Commiphora ellenbeckii* Engl. (Burseracea). In the search for potential new drug templates and alternatives from natural sources to counteract drug-resistant TB, the present work is aimed at phytochemical analysis and the biological screening of the selected plants for antimycobacterial and cytotoxicity activities.
Plant materials including *C. mildbraedii* (stem and root barks), *C. edulis* and *C. Ellenbeckii* (stem bark and leaves) were collected from various locations in Kenya, air-dried and grounded into coarse powder. Weighed plant samples (50-100gs) were extracted successively with solvents of increasing polarity- hexane, dichloromethane, ethyl acetate, and methanol. Aqueous extraction was carried out separately. Dried

extracts were tested for antimyco bacterial activity using the broth microdilution method against *Mycobacterium smegmatis* ATCC607 strain. Cytotoxicity of the extracts was determined using MTT based assay involving 96-well plate microdilution technique. Fractionation of the most active extract for GC-MS analysis was carried out using preparative TLC method.

The extraction procedure yielded thirty (30) different extracts. The broth microdilution method showed that eleven (11) of the extracts exhibited antimycobacterial activity up to 50 mg/mL. The methanolic extracts of *C. mildbraedii* stem and root barks, as well as the aqueous extract of *C. ellenbeckii* leaves, exhibited the highest bioactivities with MICs of 0.39 mg/mL, 0.78 mg/mL and 0.78 mg/mL respectively. All the tested extracts revealed none to minor cytotoxicity. The ethyl acetate extract of *C. edulis* stem bark and aqueous extract of *C.*
ellenbeckii leaves exhibited values of CC50 (1734 ± 186.04 µg/mL and 1509 ± 67.47µg/mL) which are more than twice that of the reference drug, rifampicin (528 ± 48.30µg/mL). The qualitative phytochemical screening of the active extracts revealed the presence of phenols, flavonoids, tannins, saponins, alkaloids, and terpenoids among others. Analysis of the prepTLC fractions from the most active extract (*C. mildbraedii* stem bark methanolic extract) by GC-MS technique led to the detection of 42 compounds identified as belonging to alkanes, xii alkenes, primary fatty alcohols, phenols, monoterpenoids, triterpenoids, indanone, carboxylic acids, ethers, aldehydes, carbonate esters and fatty acid esters. Lup-20(29)-en-3-one and oxylene were the most abundant compounds. With the exception of o-xylene, 1-tridecene and a-terpineol, all the compounds were detected for the first time in the *Commiphora* genus. Additionally, four compounds including 1H-Inden-1-one, 2,3-dihydro-; Carbonic acid, decyl 2-ethylhexyl ester; Carbonic acid, 2-ethylhexyl octyl ester; and Heneicosyl heptafluorobutyrate were reported for the first time as naturally occurring metabolites.

Findings in this work have justified the ethnomedicinal knowledge and usage of the selected myrrh plants by Kenyan indigenous communities to treat respiratory diseases especially tuberculosis. Additional information and database for further exploration of the rich *Commiphora* genus have also been provided.

Phytochemical Screening, Cytotoxicity and Antimycobacterial Activity of *Centella asiatica* L., *Jatropha curcas* L., and *Commiphora africana* (A. RICH.) Endl. Extracts of Medicinal Plants in Kenya Singly and in Combination with Rifampicin

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Tuberculosis (TB) kills approximately three million people annually. Efforts to treat the disease have been made difficult due to the development of drug-resistant strains and co-infection with HIV/AIDS. There is a need to develop new, inexpensive, and effective anti-TB drugs. This study aimed at screening three species of medicinal plants in Kenya for antimycobacterial activity against *Mycobacterial smegmatis* and their potential

when in combination with rifampicin. Additionally, cytotoxicity and phytochemistry of the plants were studied. The antimycobacterial activity was carried out using the MABA Assay while Checkboard Assay was used to test synergistic effects. Cytotoxicity was carried out using the MTT Assay on Vero cells. Phytochemical tests and TLC profiling were used to identify the class of compounds present in the extracts. The dichloromethane (DCM) and ethyl acetate extracts of *Commiphora africana* (stem bark) were the most active extracts against the *M. smegmatis* strain used (MIC 1.30 and 2.60 mg/mL). *Jatropha curcas* (seeds) methanol extract exhibited MIC of 2.08 mg/mL while the hexane extract (root bark) had MIC of 8.41 mg/mL. *Centella asiatica* extracts showed no activity at 100 mg/mL. However, on a combination with rifampicin, it exhibited a high synergistic effect with rifampicin having a 16-fold MIC reduction. A combination of *J. curcas* (seeds) methanol extract with rifampicin had the highest synergetic effect against the *M. smegmatis* strain used (FICI 0.25).
Commiphora africana (stem bark) DCM and ethyl acetate extracts showed an additive effect (FICI 0.75, 0.62). Cytotoxicity studies revealed that most of the extracts had CC 50>20 µg/mL thus considered safe. However, hexane extracts of *J. curcas* root bark and *C. africana* stem bark showed CC 50 <5 µg/mL thus considered toxic. Phytochemical screening revealed that the extracts contained alkaloids, flavonoids, terpenoids, coumarins, anthraquinones, phenols, saponins, sapogenins, and tannins. The study confirms the ethnopharmacological uses of the plants for TB indicating their potential to be developed into new anti-TB drugs and also as potential sources of compounds for novel combination therapies for anti-TB drug development.

Keywords: Medicinal plants, *Mycobacteria smegmatis*, Antimycobacterial activity, Cytotoxicity, Synergistic effects

Master of Science in Plant Breeding

Genetic Variability of Cowpea (*Vigna unguiculata*(L.) Walp.) Magic Rils for Resistance to Bruchid (*Callosobruchus maculatus*F.)

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Cowpea (*Vigna unguiculata*L. Walp.) is an important grain legume providing protein for human populations across sub-Saharan Africa (SSA). The storage insect *Callosobruchus maculatus* is an economically important pest of cowpea in SSA. Host plant resistance to this pest is the most environmentally-friendly, cost effective and sustainable way of combating this storage pest. Multi-parent Advance Generation Inter Cross (MAGIC) recombinant inbred lines are promising broad-base genetic resources for combating biotic and abiotic constraints to crop production. Recombinant Inbred Lines (RILs) population were developed from eight founder lines for the purpose of breeding highly resistant lines to biotic and abiotic stresses affecting cowpea production in Africa. The objective of this study was to identify sources of resistance to the cowpea bruchid *Callosobruchus maculatus* among MAGIC RILs population. A total of 295 MAGIC RILs developed at the University of California, Riverside, USA and four checks were evaluated for resistance to *C. maculatus* in the laboratory using a no-choice assay. The bruchid bioassay was set up with five seeds per line in a completely randomized design (CRD) with three replicates. Each replicate was infested with freshly emerged male (2) and female (3) to facilitate mating and laying of eggs by the females on the test seeds. Each line was observed for number of eggs laid, daily adult insect emergence and number of exit holes per seed, from which Dobie susceptibility index (DSI) was computed. All resistance parameters were subjected to analysis of variance and Pearson's correlation. Stepwise multiple regression analysis was also carried out. Estimates of variance components and broad-sense heritability were also computed. Significant genetic variation in bruchid resistance was found among the MAGIC recombinant inbred lines population. Based on Dobie susceptibility index, about 0.7% (2) and 4.7% (14) of the lines evaluated were resistant and moderately resistant, respectively. Eighty-one (about 27.1%) of the lines evaluated were moderately susceptible, 63.3% were susceptible while 3.7% were highly susceptible. Dobie susceptibility index had significant positive correlation with average number of eggs laid (r = 0.45), average number of adult emergence (r = 0.76), number of holes per seed (r = 0.72) and insect growth index (r = 0.16), but significant negative correlation with days to first emergence (r = -0.63) and median developmental period (r = -0.54). Multiple regression identified average number of adult emergence and median developmental period as the best significant predictor of DSI. These two traits accounted for 85.1% of the variation observed for resistance to *C. maculatus*. Bruchid resistance traits in the MAGIC RILs screened had moderately to high broad-sense heritability (48.6 to 87.3). Broad-sense heritability was greater than 80% for days to first emergence and median developmental period. Genetic variation for resistance to *C. maculatus* exists among the MAGIC RILs population. Magic-017 and Magic-142, which showed highest levels of resistance to *C. maculatus*, have high potential for use in cowpea breeding programmes.

Keywords: Resistance, Recombinant inbred lines, MAGIC, bruchid, *C. maculates*

Screening of Rice (*Oryza sativa L.)* Genotype for Tolerance to Flooding during Germination and Early Seedling Establishment

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Globally, many rice (*Oryza sativa L.*) farmers are abandoning the conventional practice of transplanting for direct seeding because transplanting requires the use of more water in addition to been capital and labour intensive. Direct seeding is however associated with poor seeding establishment and crop losses in the event flooding occurs immediately after sowing. This study was therefore undertaken to identify lines tolerant to anaerobic germination and early seedling establishment, hence suited for direct seeding. Effect of soils from different sources was also studied on anaerobic germination and seedling features of selected genotypes.

Two experiments were conducted at the Crop Research Institute, Fumesua-Kumasi, Ghana in 2019. In the first experiment (preliminary trial), one hundred diverse genotypes including a tolerant check (KHO) and susceptible check (IR42) was screened. The seeds per disposable cup were sown in five disposable cups to represent a genotype. The seeds were sown at soil depth of 1 - 1.5 cm and water was applied to a depth of 10cm immediately after sowing. This flooding depth was maintained for 21 days. A non-flooded trial following similar procedures was also set-up alongside. The experiments was laid out in randomized compete block design with three replications. In the second experiment, differential response of five lines (two tolerant lines and one moderately tolerant line identified from the first experiments alongside the checks) were studied on two different sols sourced from upland and lowland respectively. Similar procedures in the first experiments were followed in conducting the second experiment however this was laid out in split-split plot design. Water depth was the main plot, soil types as sub-plot and genotypes as the sub-sub plot.

Findings from the preliminary trial showed wide variability for tolerance to anaerobic germination and early seedling establishment among the lines evaluated. The tolerant check (KHO) recorded the highest survival percentage (87%), longest shoot (28.07 cm), longest root (12.86 cm), longest leaf portion above water (20.67 cm) and highest seedling vigour index (2430.93). IR64 sub 1 and KAF 471 had the least survival percentage (0%), Sambamansuri sub 1 recorded the lowest value for the following parameters: shoot (8.74 cm), root (5.83 cm) and leaf portion above water (0.6 cm) and CRI-Oboafo had the least value for survival index (48.67). In the second experiments, survival percentage decreased under lowland conditions as compared to upland soil. The strongest relationship for survival percentage under flooded condition was with the mesocotyl length ($r = 0.834$) followed by coleoptiles length ($r = 0.756$) both of which were significant at $P < 0.05$. seedling traits comprising of leaf portion above water, base diameter, coleoptiles length, mesocotyl length, internode length, shoot length, root length and seedling dry matter were significantly f=different ($P < 0.05$) amongst tolerant and susceptible genotype for both soils under flooded condition. KHO and OBOLO had the statistics highest values for these features while IR42 had the lowest values.

In conclusion, soil types were found to influence anaerobic germination. More so, OBOLO and CRI-Enapa identified as sources to anaerobic germination in this work, will

be useful to rice breeders and farmers in Ghana and other sub-Saharan Africa countries.

Keywords: Anaerobic germination, Direct seeding, Survival percentage, Soil

Screening of Rice Genotypes for their Reactions to Rice Yellow Mottle Virus Disease in Ghana

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Rice yellow mottle virus (RYMV) is the most damaging virus damaging virus diseases of rice (*Oryza sativa L.*) in Africa, causing up to 100% yield loss on farmers' field when susceptible cultivars are grown. The objectives of this study were to screen 172 rice genotypes for their reactions to the major RYMV strain in Ghana and determine the correlation between RYMV disease severity and some agronomic traits of rice.
One hundred and seventy-two rice lines from Korea-Africa Food and Agriculture Cooperation Initiative (KAFACI) were screened for their level of resistance to rice yellow mottle virus in a screen house and in the Virology Laboratory of the Council for Scientific and Industrial Research, Crops Research Institute of Ghana (CSIR-CRI). Four checks consisting of two highly resistant lines (Tog7291 and Gigante with rymv2 and rymvl resistant alleles, respectively), a moderately resistant line (CRI-Amankwatia) and a susceptible cultivar (Jasmine85) were used. The experiment was carried out in a 4 x 44 lattice design with four replicates and two inoculation treatments. The first treatment was inoculated with RYMV while the second non-inoculated and served as control. Screening was by visual symptoms scoring and virus-assessment through ELISA Test. Disease severity and incidence were assessed from 2 to 42 days after inoculation. Data for disease severity and incidence were transformed (log x+1) for ANOVA. Statistical analyses were carried out using PBIB test of R statistical software, version 3.6.1. Correlation analysis, using Pearson's product moment method in R, was used to determine the relationship among the traits.
Field and DAS-ELISA results were highly related (r = 0.99). Significant positive correlations were observed between disease severity and percentage grain yield reduction (r = 0.29), plant height (r = 0.30), culm length (r = 0.35), days to heading (r = 0.17), weight of biomass per plant (r = 0.38), number of panicles per plant (r = 0.26) and number of tillers per plant (r = 0.33). However, the disease severity was not correlated with the reduction on panicle length (r = 0.11). Five highly resistant lines (8261112, 8261119, 8261133, 8261588 and 8261634) and 24 resistant lines were identified from the KAFACI germplasm. A total of 100 lines were moderately resistant while 43 were susceptible. No highly susceptible line was identified.
Promising sources of resistance to RYMV are available in the KAFACI germplasm. The resistant and moderately resistant genotype could be cultivated by farmers under integrated production systems and breeders could use them to develop new RYMV cultivars.

Keywords: Severity, Incidence

Validation of Single Nucleotide Polymorphism Makers Associated with Cassava Mosaic Disease Resistance in a Clonal Evaluation Trial

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Cassava (*Manihot esculenta* Crantz) is an important staple crop in Africa for almost half of the population. The main biotic constraint of the crop is Cassava Mosaic Disease (CMD) which causes significant losses on farmers' fields. The conventional screening method for CMD resistance in new cassava populations is time-consuming, expensive and not highly reliable. However, there are newly developed Single Nucleotide Polymorphism (SNP) markers linked to CMD resistance which have not been validated. Therefore, the objective of this research was to validate the predictive ability of the markers for resistance to CMD.

In this study, three SNP markers S12_7926163, S12_7926132, and S14_4626854 were used to genotype a breeding population consisting six hundred accessions from the International Institute of Tropical Agriculture (IITA) by using a Kompetitive Allele-Specific PCR (KASP). These accessions were evaluated on the field using an augmented experimental design divided into ten blocks with five checks planted randomly and each block had non-replicated single-row plots with five plants each. Assessment of CMD severity was done using a 1-5 scale (1 = Symptomless and 5 = high severity of CMD at 1 and 3 months after planting. Harvesting was carried out at 10 months after planting. Data were collected on fresh root weight, shoot weight, and dry matter content. The phenotypic data collected were used to estimate the fresh root yield and harvest index (HI). The data were subjected to correlation and the estimates of variance components, broad-sense heritability, best linear unbiased predictors and base selection index were used to select the best accessions on their performances to CMD resistance and high fresh root yield. The genotypic data were processed to ensure the quality of the markers by checking the call rates, the minor allele frequency, the proportion of heterozygosity and then to test the accuracy in prediction for all the markers through the marker-trait association.

Under field screening condition about 75% of the accessions evaluated in this study had severity scores of 1 and 2 and were therefore resistant to CMD. There was a significant negative correlation ($P < 0.001$) between CMD severity and yield-related traits which ranged between -0.13 and -0.35. Accession TMS18F1289P0016had highest dry mater content of 46 % while accession TMS18F1170P0010 had the least value of 15.4%. Fresh root yield ranged from 1.5t/ha TMS18F1302P0015 to 43.8 t/ha (TMS15F1367P0001). Harvest index ranged between 0.8 (TMS18F1017P0025) and 0.03 (TMS18F1159P0019). Broad sense heritability estimate for dry matter content, CMD resistance, harvest index and fresh root yield was 97%, 82%, 40%, and 4.85E-07% respectively. Accession TMS18F1151P0011 had highest selection index (SI) value (28.24) selected as the accession which had with resistance to CMD. The genotyping results revealed that the call rate of the SNPs was above 95%. The minor allele frequency ranged between 0.3 and 0.4 and the proportion of heterozygosity was more than 0.4. Markers S12_7926132, S12_7926163 and S14_4626854 had prediction accuracy values of 87.5, 87.3 and 62.6%, respectively. With all the SNP markers, the rate of false

positive genotypes was less 15% while the false negative genotypes was less than 25%. In conclusion, the SNP markers evaluated in this study can be reliably used to screen cassava germplasm for resistance to cassava mosaic disease.

Keywords: Cassava mosaic disease, Single nucleotide polymorphism, Kompetitive Allele-Specific PCR

Screening of Wild Cowpea [*Vigna Unguiculata* (L.) Walp.] Relatives for Resistance to *Callosobruchus Maculatus* (Fabr.)

Prisca SEUREI ***(PAU-UI-0266)***

Cowpea (*Vigna unguiculata*) grains are rich in protein, minerals, carbohydrates, vitamins and is a source of income for small scale farmers in tropical Africa. Storage of cowpea grains after harvest is however constrained by *Callosobruchus maculatus* infestation, which reduces its quantity and quality, rendering it unfit for planting, marketing and human consumption. Chemical insecticides which are widely used to control *C. maculatus* infestation in sub-Saharan Africa, are not readily available and could have detrimental effects on environmental and human health. Use of resistance, both in wild and cultivated genotypes, is the most reliable method to manage *C. maculatus*. This study was therefore carried out to screen some wild cowpea lines for resistance to *C. maculatus* infestation.

In a laboratory experiment, 109 wild cowpea relatives and six checks were screened for resistance to *C. maculatus*. The experiment was laid in a completely randomized design with three replicates. Five seeds of each genotype were infested with five newly emerged adult *C. maculatus* and allowed to mate and lay eggs on the seeds before they were removed. Data were recorded on number of eggs laid on the seeds (NEL), number of emerged insects (NEI), number of seeds with holes (NSWH), number of seeds without holes (NSWTH), total number of holes (TNH) and days to first adult emergence (DFE). Median developmental period (MDP), percentage adult emergence (PAE), insect growth index (GI) and Dobie's susceptibility index (DSI) were computed using some of the data. Data were subjected to analysis of variance, correlation and multiple regression.

The tested cowpea lines differed significantly in their responses to *C. maculatus* infestation. Based on DSI values, six wild cowpea lines (TVNu-106, TVNu-1924, TVNu-78, TVNu-1723, TVNu-1959 and TVNu-1929) were highly but not completely resistant. The DSI was significantly correlated with NEL ($r = 0.45$), NEI ($r = 0.78$), TNH ($r = 0.75$) and NSWH ($r = 0.76$), DFE ($r = -0.54$), MDP ($r = -0.38$) and NSWTH ($r = -0.76$). The relationship of DSI with PAE and GI was not significant. The NEI, NSWH, MDP, TNH and DFE explained 92.4% of the variation in susceptibility of the cowpea lines to *C. maculatus* infestation. Broad sense heritability ranged from 32.0% (PAE) to 82.2% (NEI).

Wide variations exist among the wild cowpea genotypes for resistance to

Callosobruchus maculatus infestation. Six new potential sources of resistance genes to *Callosobruchus maculatus* infestation from wild cowpea were identified, which could be useful for the improvement of cultivated cowpea varieties.

Keywords: *Vigna unguiculata*, Wild cowpea relatives, *Callosobruchus maculatus* infestation, Susceptibility index

Evaluation of Rice (*Oryza Sativa* L.) Germplasm from Korea and Their F1 from Crosses with Rice Genotypes Adapted to Nigeria

Sonangnon Fiot TONEGNIKES (*PAU-UI-0267*)

The increasing demand for rice (*Oriza sativa* L.) necessitates not only improvement in cultural practices but also the inbuilt genetic potential of the varieties cultivated in sub Sahara Africa. A successful breeding programme depends on the evaluation and identification of useful parents for achieving the goals of genetically improving the crop and producing high yielding varieties. This study was carried out to evaluate rice accessions from South Korea for adaptability to the environmental conditions in Nigeria, their seed set following hybridization with ten rice varieties adapted to Nigeria and the field performance of the crosses.

A total of 30 anther culture-derived rice genotypes from South Korea were crossed as female to 10 genotypes from Nigeria which were used as male. The experiment was established in the dry season of 2018/2019 under irrigation using alpha lattice design with eight blocks each planted to five entries and replicated three times. Plots consisted of two rows each of 3m length. Spacing between rows and between plants in a row was 20cm. Basal NPK (15:15:15) was applied at the rate of 200 $kgha^{-1}$. Data were collected on plant vigour, plant height, number of days to 50% flowering, number of tillers per plant, number of panicles per plant, number of spikelets per panicle, panicle weight, spikelets fertility, number of days to maturity, panicle length, 1000-grain weight, and yield. Data were subjected to analysis of variance. Cluster analysis was used to group the genotypes on the basis of their similarity.

Analysis of variance revealed highly significant differences among the genotypes for all traits, an indication of wide genetic variability. FARO 67, UPN287, FARO 66, UPN315 and UPIA1 showed high tillering ability while UPN349, UPN335, UPN271, UPN324 and UPN300 had the highest number of spikelets per panicle. UPIA 1, SAHEL 21, UPN301, UPN266 and FARO 57 showed superiority for 1000-grain weight while UPIA 1, UPN266, UPN349, UPN300 and FARO 67 had the highest grain yield per plant. Cluster analysis grouped the 40 genotypes into five clusters. On the basis of yield and its components, FARO 67, UPN287, UPN349, UPIA1, UPN266 and UPN300 were the most promising genotypes to be considered for rice hybridization in the development of high yielding varieties adapted to Nigeria. Low success rate of hybridization was associated with spikelets infertility. The five most promising female parents based on percentage seed set were UPN315, UPN341, UPN349, UPN313 and UPN290 while the

best male parents were ARICA3, UPIA2, UPIA1 and UPIA3. Progenies UPN296/UPIA2, UPN289/UPIA3 and UPN290/UPIA3 showed early 50% flowering indicating considerable potential for developing early maturing rice varieties.

Keywords: Evaluation, Temperate Japonica, Adapted genotypes, Hybridization, Seed set, Pollination, *Oryza*.

Genetic Variability for Yield, Yield Components and Mosaic Disease in Biofortified Cassava Populations

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Cassava storage root is a major food source widely consumed in sub-Saharan Africa. Despite its importance, cassava root is poor in essential micronutrients, especially iron, zinc, protein, vitamins A and D. It is also faced with menace of cassava mosaic disease which can cause total yield loss. Cassava biofortification is a breeding strategy to develop cassava with enhanced vitamin A content but there is a need to ensure the selected genotypes in a breeding programme are resistant to mosaic disease. The objective of this study was therefore to elucidate genetic variability among genotypes in newly developed biofortified cassava populations for resistance to mosaic disease, total carotene content and yield related components.

Twelve F1 families generated from controlled crosses involving 13 yellow cassava genotypes and one white root were evaluated in Ibadan using augmented randomized complete blog design with two replications. The plants were arranged in rows which were 1m apart with plant spacing of 1m x 0.25 m for 9-months. Data were collected on cassava mosaic disease severity, root flesh colour; root size, number of storage roots, root pulp hardness and fresh root yield. Screening of cassava mosaic germini viruses was done by the use of Multiplex PCR. Selected of best genotypes for advancement to clonal trails was based on root flesh colour and pulp hardness scores. The selected genotypes were subjected to quantitative analysis of dry matter and total carotenoid content. Restricted maximum likelihood linear mixed model was used to analyse family and progeny data of the seedling trail. Association of traits were estimated by the Pearson correlation method.

The differences among the progeny and families highly significant ($p < 0.001$) for fresh storage root yield, root size, number of storage roots, root pulp hardness and cassava mosaic disease. There was significant and positive correlation between fresh root yield and each of root size and root number. Dry matter showed negative but significant correlation with total carotenoid content. Molecular diagnostics of the leaf samples collected from the field revealed the presence of African cassava mosaic virus (ACMV) and East African cassava mosaic virus (EACMV). Total carotenoid caroteniod values in the selected genotypes ranged from 6.94 to 27.19 µg/g with a mean of 14.59 µg/g. The mean root dry matter content in the selected genotypes was 35% and ranged from 20 to 47%.

The high level of variation observed in the segregation F_1 progenies for almost all the evaluated traits indicates good potential for selection and genetic gain.

Keywords: Biofortification, Cassava mosaic disease, Total carotene content, Pulp hardness, Dry matter content

Genetic Variation for Beta-Carotene Content and Relatedtraitsamong Biofortified Cassava Genotypes

Deekermue PAYE *(PAU-UI-0269)*

Breeding staple cassava varieties with pro-vitamin A (PVA) content is crucial for combating the widespread nutritional problems of vitamin A deficiency (VAD), especially among the vulnerable people in Sub-Sahara African (SSA) countries. Biofortified cassava with enhanced beta-carotene content would help in alleviating vitamin A deficiency in Africa. The existing cassava varieties have relatively low beta carotene content and need further improvement of cassava for the traits. This study aimed at evaluating biofortified cassava genotypes for beta-carotene and yield related traits in three breeding populations. Three cassava populations developed from cross combinations from three IITA elite biofortified cassava genotypes (IITA-TMS) IBA070539, IBA070593 and IBA061635 as female progenitors to generate three improved breeding populations respectively at the seedling nursery (TMS-IBA180576, TMS-IBA180589, and TMS-IBA180738 with varying number of individuals in each population. Each of the three populations consisting of 225,318 and 212 individual plants per population at 9 months after planting (MAP) were scored for beta carotene using colour chart, and evaluated for yield related characters including dry matter, root weight and harvest index. The data generated were subjected to descriptive statistical analysis using IBM SPSS v20. Cassava mosaic disease severity score ranged from 1 to 3among the progenies with 77.8%, 47% and 28% of individual plants respectively in populations TMS-IBA180576, TMS-IBA180589 and TMS-IBA180738having mean ⩽ 1, while beta-carotene score ranged from 2 to 6 among the progenies with 5.3%, 3.1% and 2.4% of individual progenies from populations TMS-IBA180576, TMS-IBA180589 and TMS-IBA180738 with mean beta-carotene (chart) >6.Accession IBA-SN180738-5 had the highest HI of 0.93 in population TMS-IBA180738 and IBA-SN180589-48 had the highest HI of 0.92 in population TMS-IBA180589. There was significant positive correlation between storage root weight/plant and shoot biomass among the genotypes at P⩽ 0.5 and 0.01 levels of significance in the three populations. The biofortified cassava genotypes with high beta-carotene content and good agronomic traits selected in this study have been advanced to the next breeding stage for evaluation.

Keywords: Biofortification, beta carotene, Provitamin A

Genetic Diversity of Rice (*Oryza Sativa* L.) Lines from Korea and Africa for Yield and Related Traits

Komla Exonam AMEGAN (*PAU-UI-0270*)

Genetic diversity is a prerequisite for crop improvement programme as it helps in identifying diverse parental combination to create superior progenies. This investigation in rice (*Oryza sativa* L.) was undertaken to study genetic diversity of some Korea germplasm and African adapted varieties based on molecular and morphological traits for utilization in breeding programme. A total of 130 rice genotypes were characterized in this study for 12 quantitative morphological traits, and 17 Simple Sequence Repeat (SSR) markers were used for genotyping.

Number of days to 50% flowering, days to maturity, panicle length and weight, plant height, spikelet fertility and 1000-grain weight showed wide variation among the genotypes. After evaluation of the 130 accessions for 12 quantitative characters, top ten accessions were identified to be superior genotypes for the yield and its attributing traits. Higher PCV and medium GCV values were exhibited by number of spikelet, number of filled grain per panicle, panicle weight and grain yield, which suggests the possibility of improving the traits through selection. The highest heritability was recorded for day to maturity followed by days to 50% flowering, 1000 grain weight, panicle length and grain yield. High genetic advances as percent of means were recorded by grain yield, number of filled grain per panicle and panicle weight. Dendogram using agglomerative clustering method based on morphological traits grouped the 130 rice genotypes into 4 clusters at 12.5% genetic similarity level. Some genotypes were superior for more than one character. Grain yield showed highly significant positive correlation with almost all the traits. Genetic variation analysis of morphological traits resulted in grouping of the genotypes into four clusters. Principal component analysis revealed that 73.59% of the variability was contributed by the first four principal components. Selection can be designed to bring about quick improvement of dependent variable such as grain yield by choosing parents from PC1 and PC2.

All the seventeen SSRs markers used were polymorphic. A total of 70 alleles were obtained on polymorphic SSR with an average of 4.12 alleles per marker and the number of alleles ranged from 2 to 6. The Polymorphism Information Content (PIC) values ranged from 0.34 to 0.76 with an average value of 0.53. The genetic diversity of each SSR locus appeared to be associated with number of alleles detected per locus. UPGMA dendrogram based on similarity index of simple matching grouped the 130 genotypes into three clusters at 51.8% genetic similarity level. Both morphological and molecular dendogram placed UPIA1 alone in separate cluster with Korea lines. The information obtained will be very useful for proper identification and selection of suitable parents for future use in breeding programme.

Keywords: Rice, Genetic diversity, PIC, SSR marker

Master of Science in Reproductive Health Sciences

Masters in Reproductive Biology Option

Factors Influencing Late Presentation of Women with Cervical Cancer at the University Teaching Hospital of Kigali, Rwanda

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Background: Cervical cancer is ranked as the second most common type of cancer affecting women. The majority of women who develop cervical cancer live in rural areas and the rate can be up to 15 times higher in poor countries compared with industrialised ones. The highest incidence has been reported in Eastern, Western and Southern Africa including Rwanda. Thereof, this study aims at exploring and describing the factors that contribute to late and early presentation of women with cervical cancer at the University Teaching Hospital of Kigali, Rwanda.

Methods: A comparative cross-sectional study using consecutive sampling technique was done among cervical cancer patients. The data was collected using structured self-administered questionnaire. The collected data were cleaned, coded and entered into Epidata and then exported to SPSS version 21 for analysis. Descriptive statistics such as mean, standard deviations and percentage were used to describe the data. Tables and figures were used to present the data. Logistic regression was used to indicate the association between explanatory variables such as socio-demographic attributes, respondents' knowledge about cervical cancer and the outcome variable which was the clinical stage at the time of presentation to hospital for treatment.

Results: It was found that, educational status,[Adjusted Odds Ratio or (AOR) 2.5 (95%;CI; 1.21-18.31)]; employment status,[AOR 3.6(95%; CI; 1.42-7.31); feeling of embarrassments to expose their private parts, [AOR 3.07(95%; CI; 1.59-5.93)]; respondents' knowledge on the benefit of PAP-test for prevention of cervical cancer, [AOR 0.35(95%; CI; 0.24-0.75)] were associated with stage at presentation to hospital among cervical cancer patients in this study.

Conclusions: Women with cervical cancer who had primary education only, were unemployed, felt of embarrassment to expose their genitalia or were less knowledgeable about the importance of the PAP-test for prevention of cervical cancer were more likely diagnosed at late stages. Such women should be targeted for cervical cancer screening and a health education program, and encouraged to have health insurance.

Keywords: Cervical cancer, Late stage, Developing countries, Rwanda

Lifestyle and Oxidative Stress Status in Female Infertility: Comparative Cross Sectional Study in Dar Es Salaam, Tanzania

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Background: Female infertility is a public health problem, contributing 65.9% of infertility in Tanzania. Lifestyle and oxidative stress (OS) have been suggested to affect female fertility however, there are limited and controversial reports from previous studies. This study aimed to determine lifestyle and OS status of fertile and infertile women and relate lifestyle and oxidative stress in female infertility.
Methods: This comparative cross sectional study was conducted among randomly selected 48 fertile and 48 infertile women of reproductive age group attending Gynecological clinic at Muhimbili National Hospital. Proforma was used to collect information on sociodemographic and lifestyle. Anthropometric measurements were taken and sandwich ELISA method was used to analyse oxidative stress biomarkers (malondialdehyde and total antioxidant capacity analysis). Descriptive statistics, Pearson Chi square, independent t test and correlation coefficient were applied in data analysis at $p < 0.05$.
Results: Infertile women were significantly older (33.4 versus 30.3 years, p=0.03), got married at later age (25 versus 22.8 years, p=0.02), employed (61.7% versus 29.8%, p=0.001), have attained university degree (55.7% versus 35.3%, p=0.004), more obese, more likely to consume alcoholic drinks (p=0.02) and less likely to use supplement (p=0.000) than fertile women. Infertile women had statistically significant higher MDA (p=0.000) and lower T-AOC (p=0.000) levels than fertile women. T-AOC had statistically significant negative correlation with age at marriage (r=-0.26, p=0.009), alcohol consumption (r=-0.27, p=0.008) and obesity (r=-0.32, p=0.002) and had significantly positive correlation with supplement use (r=0.24, p=0.02). Also, MDA had statistically significant positive correlation with age at marriage (t=0.23, p=0.03), alcohol consumption (r=0.31, p=0.002) and obesity (r= 0.28, p=0.007).
Conclusions: The differences in socio-demographic characteristics, lifestyle and OS between fertile and infertile women may account for difficulties in achieving pregnancy among infertile women in Tanzania. Also, evidence shows that lifestyle may contribute to OS. Health education on appropriate lifestyles that support female fertility and the emphasis on supplements use during preconception period may be beneficial in management of female infertility.

Keywords: Female infertility, Lifestyle and oxidative stress status

Stress, Psychological Distress and Serum Antimüllerian Hormone Levels among Fertile and Infertile Women in Ilorin Teaching Hospital, Nigeria

Oyinkansola Islamiyat LAWAL (*PAU-UI-0326*)

Evidence from previous research suggests that stress and psychological distress influences ovarian ageing, response and IVF success. However, there is conflicting evidence on the effect of stress and psychological distress on serum AMH as a marker of ovarian reserve, response and ageing. This study aimed to determine the association between stress, psychological distress and serum AMH level among fertile and infertile women. This study was a case-control study among 81 infertile and 109 fertile women attending the University of Ilorin Teaching Hospital.; Semi-structured, self-administered questionnaire was used for collecting background information, while stress and psychological distress were measured using perceived stress scale-10 and Kessler Psychological distress scale-10 respectively. Serum AMH was estimated using Enzyme-linked Immunosorbent Assay. There was no difference in serum AMH between fertile and infertile women (p-value=0.494). There was no significant correlation found between perceived stress and serum AMH in both fertile (r= 0.090; p-value=0.353) and infertile women (r= 0.041, p-value= 0.719). There was also no correlation demonstrated between psychological distress and serum AMH in either of the fertile (r= -0.049; p-value=0.636) and infertile (r= -0.020; p-value=0.860) women. However, women with mild psychological distress were 54% less likely to have serum AMH level greater than 4ng/ml when compared with those with normal psychological distress level (OR = 0.46; p-value = 0.048). In addition, there was a significant negative correlation between Age(r= -0.322 p-value< 0.01) and parity (r= -0.216, p-value=0.003) with serum AMH level; while cycle length (r=0.248; p-value= 0.001) and BMI (r=0.171; p-value=0.019) had a positive correlation with serum AMH in all women. However, on stratified analysis, BMI and parity lost significance in the fertile and infertile women respectively. Multivariate analysis showed a significant relationship between age and low AMH(<1ng/ml) while age (p=0.027;OR=0.892), cycle length (0.038; OR=1.172) and dysmenorrhea(0.036;OR=2.288) were related to high serum AMH level (>4ng/ml). In conclusion, the results of this study suggest that there is no difference in serum AMH level between fertile and infertile women; and also no relationship between stress as well as psychological distress and serum AMH level.

Comparison of Sex Hormone Levels among Type Ii Diabetic and Non-Diabetics in Offinso North District, Ghana

Dorcas SERWAA (*PAU-UI-0327*)

Introduction: Diabetes mellitus is a group of diseases characterized by high blood glucose level, over 90% of people with diabetes mellitus are type II diabetic. Type II

diabetes mellitus is associated with endocrine disorders and infertility. This research compares the levels of serum sex hormones levels in type II diabetes mellitus patients and non-diabetic to determine the prevalence of hypogonadism and then establish the association between some socio-demographic, clinical and lifestyle factors with the levels of follicle stimulating hormone (FSH), luteinizing hormone (LH) and testosterone.

Study Design: The study was a hospital-based comparative cross-sectional study on type II diabetic and non- diabetic males attending Nkenkaasu Government Hospital, Offinso-North District of Ghana.

Materials and Methods: A total number of 198 diabetic and non-diabetic men were recruited into the study. A structured questionnaire was used to document relevant information. Venous blood sample of about 5 ml will be taken to measure fasting blood glucose (FBG), FSH, LH, and testosterone levels.Serum levels of sex hormones were determined using Enzyme-Linked Immunosorbent Assay (ELISA) test.

Statistical Analysis: All data were analyzed using Stata Statistical Software version 12 (STATA Corporation, Texas, USA) for analysis. All data were expressed as the mean ± standard deviations. Comparisons between groups were performed using a one-way ANOVA. Correlation analysis was used to determine the association between type II diabetes mellitus and sex hormone levels at 5% confidence interval. Logistic regression was utilized to determine the predictors of hypogonadism.

Conclusions: This study demonstrates that serum FSH, LH and testosterone concentrations are certainly lower in a type 2 diabetic men. The prevalence of hypogonadism among men with type II diabetes is high. SBP, DBP, smoking, BMI, and HRQoL were found to be the independent risk factors for hypogonadism.

Keywords: Diabetes mellitus, Sex hormones, Follicle stimulating hormone (FSH), luteinizing hormone (LH) and testosterone

Masters in Reproductive Health Option

Maternal Health Financing Options among Women of Reproductive Age Group in Akko LGA Gombe State

Ibrahim Banaru ABUBAKAR (*PAU-UI-0232*)

Background: The progress to reducing maternal mortality has been too slow, according to the Nigerian Demographic and Health Survey, (NDHS) report for 2008 and 2013, Nigeria achieved practically no reduction in Maternal Mortality Ratio (MMR). A joint WHO, UNFPA and UNICEF 2015 report, revealed worrisome regional disparity in maternal mortality burden in Nigeria with the Northeast having the highest figures of 1,549 deaths per 100,000 live births compared to Southwest with 165 deaths per 100,000 live births. The maternal death prevalence depends on several factors including; living

in an urban or rural area, socio-economic status and the ability to pay maternal health services user costs.

Methodology: A cross-sectional descriptive study design. The study population consists of women within the reproductive age group who had experienced childbirth within 12 months preceding the proposed study and have been residents of the community for at least 24 months. A sample size of 402 was calculated. Interviewer administered questionnaires was used and the results analyzed using Statistical Package for Social Sciences (SPSS) version 21.

Results: Common maternal health problems found in this study were anaemia, haemorrhage and hypertension. Average costs of ANC was 4,900 NGN, delivery was 3,200 NGN and post-natal care 200 NGN, amounting to 8,300 NGN average cost of maternal health service. Of the patterns of financing maternal health services majority about 69% were paid by husband out of pocket, few by the government and other sources. About 19 percent of the respondents suffered catastrophic health expenditure.

Conclusions: From this research, common maternal health problems in Akko were include anaemia, hypertension and haemorrhage. Anaemia was high even among those who have attended ANC, an implication for policy. The average cost incurred by woman to finance maternal health was 8,300 NGN, where ANC costs an average of 4,900 NGN, 3,200 NGN for delivery and 200 NGN during post natal care. Most of the women have their maternal healthcare costs borne by their husbands, others bear the cost themselves or from the government. About 19% of the respondents suffer catastrophic health expenditure as they spent 10% or more of their annual income to finance maternal health services.

Keywords: Maternal health, health financing, Out of pocket expenditure, Nigeria, catastrophic health expenditure

A Dissertation on Knowledge, Attitude and Barriers to Hormonal Contraceptive Use among Women with Sickle Cell Disease in the Kumasi Metropolis of Ghana

Abdul-Karim, ABUBAKARI (*PAU-UI-0233*)

Introduction: Despite recognized maternal and neonatal morbidity associated with unplanned pregnancy in women with SCD, unmet need for contraception in this population remains high. While low uptake is not unique to SCD. The impact of patients' knowledge, attitudes and barriers on contraceptive use in the Kumasi Metropolis is unknown.

Method: A total of 378 women with sickle cell disease were sampled using the cross-sectional design in selected health facilities in the Kumasi Metropolis of Ghana. A questionnaire was the sole instrument used to gather from women with SCD within their reproductive ages. The questionnaire elicited information on knowledge, attitudes and barriers to hormonal contraceptive use among women with sickle cell disease in the

Kumasi Metropolis of Ghana.
Results: Two hundred and fifty-four (62.5%) of respondents were aware of progestin-only contraceptives. Among the sources of contraceptives, health facility was the most common 91 (35.8%). Among contraceptives most commonly used were condoms (32.1%) followed combined oral contraceptives (18.4%), natural methods (12.8%), injectable (9.2%), no method (8.3%), implants (8.3%), oral contraceptive pill (5.5%) and sterilisation (5.5%). Knowledge was significantly associated with educational qualification, marital status, and parity. Attitude was significantly associated with age, religion, occupation and parity. Out of the total sample 336 (89.0%) had poor knowledge; 196 (51.2%) respondents who were sexually active but had poor attitudes to progestin-only contraceptive use. Women wanting to get pregnant (p value _ **0.001)** and partners support for use (P value =0.006) were significantly found to be the principal barriers to hormonal contraceptive use among women with sickle cell disease.
Conclusions: The study therefore concluded that respondents had poor knowledge, poor attitudes and the two principal barriers such as women wanting to get pregnant and partner's support for use were significant barriers against hormonal contraceptive use.

Keywords: Hormonal contraceptives, Progestin-only contraceptives, Knowledge, Attitudes, Barriers

Detection of Puerperal Sepsis with Procalcitonin Biomarker at the University College Hospital, Ibadan, Oyo State

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Background: Bacterial infections during labour and the puerperium are among the direct leading causes of maternal deaths worldwide, accounting for about one tenth of the global burden of maternal mortality. Although the total number of sepsis-associated maternal mortality has decreased remarkably in high-income settings, the situation is yet to improve in resource-limited settings. Most of the estimated 75,000 maternal deaths occurring worldwide annually as a result of sepsis are recorded in low-income countries.
Objectives of the study: The general objective of the study was aimed at detecting puerperal sepsis with procalcitonin biomarker. It also compared the serum level of procalcitonin among patients with puerperal sepsis and patients without puerperal sepsis at University College Hospital, Ibadan, Oyo State.
Methodology: This study utilised a case-control study to detect puerperal sepsis with procalcitonin biomarker among patients attending the University College Hospital, Ibadan, Oyo State. A total of 108 participants (36 cases and 72 controls) were recruited into the study using purposive sampling technique. This study was carried out in the lying-in wards of University College Hospital (UCH) Ibadan, Oyo State, Nigeria. About 0.5mL to 2mL of blood samples was collected from the participants. An interviewer-administered questionnaire was completed (post-delivery) by the research assistants.

Results: The study revealed that 45.2% of post partum women in the case group had high serum PCT levels compared to women in the control group with PCT level of 3.1%. Sensitivity: 45.2%, so the test is able to detect 45.2% of the people with disease.
Conclusion: PCT is a useful diagnostic test for puerperal sepsis.

Keywords: Puerperal Sepsis, PCT, UCH

Attitude and Behaviour of Healthcare Providers toward Provision of Srh Counseling and Services to Unmarried Adolescents in Ngozi, Burundi

Cécile NIHORIMBERE (*PAU-UI-0328*)

Background: Despite progress in sexual and reproductive health and rights (SRHR), elaboration of policy and strategic documents where the sexual and reproductive health issues are well reflected, the adolescent sexual Reproductive health remains an issues in Burundi. This study aimed to assess the attitudes and behaviors of Burundian health workers on the provision of sexual and reproductive health counseling and services to unmarried adolescents and factors associated with their attitudes and behaviors.
Methodology: A descriptive cross sectional study design using a mixed method approach was applied for the study. For the quantitative survey, a sample of 167 were participated in the study. A semi-structured interviewer administered questionnaire was used to reach the objectives. The qualitative survey was composed of six focus group discussion (FGD) for adolescents and three focus group discussion for providers with a minimum of 8 participants in each group. The collected data were cleaned and entered into Excel and then exported to SPSS Ver.21 for analysis. The X^2 were used to indicate the association between explanatory variables and the outcome variable which was attitude and behaviour of healthcare providers.
Results: Majority (74.9%) of participants had positive attitude toward provision of family planning services to unmarried adolescents, 97%of participants had positive attitude toward provision of counselling services to unmarried adolescents, 62.9 % participants had positive attitude toward unmarried adolescent's decision in SRH services use, 64.1% had positive attitude toward unmarried adolescent sexuality. Their behaviour was also positive and significantly associated with the attitude.
Conclusions: The study found positive attitude and behaviour toward provision of SRH to unmarried adolescent and the behaviour was significantly associated with the attitude of providers: Special attention is needed toward training on ASRH by emphasizing to the right of adolescent SRH and the sexuality in adolescent. Moreover, more advocacy is needed for the implementation of the plan on ASRH.

Keywords: Healthcare providers, Attitude and behavior, SRH, Unmarried adolescent

The Influence of Intimate Partner Violence on Antepartum Depression among Child-Mothers in Kaduna-North District, Kaduna, Nigeria

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Introduction

Child marriage is the union in marriage of either a single spouse or both of them less than 18 years of age. This is a common practice in all countries of the world. It has particularly been a challenge in Africa as most of the problems faced ranging from the rising population; poor health indices and economic decay are linked to child marriage. It affects both boys and girls but predominantly the girls.

Main objectives: To determine the influence of intimate partner violence on antepartum depression among child-mothers in Kaduna North District, Kaduna state, Nigeria.

Specific objectives:

1. To determine the prevalence of antepartum depression among child-mothers in Kaduna North District.
2. To identify the socio-demographic characteristics of the child-mothers in Kaduna North District.
3. To determine the prevalence of intimate partner violence among child-mothers in Kaduna North District.
4. To determine the association between intimate partner violence and antepartum depression among child-mothers in Kaduna North District.

Methods: In this cross-sectional study, 349 pregnant girls below the age of 18 attending antenatal clinic in 2 primary and 3 secondary and 1 tertiary health care centre by purpose sampling in Kaduna state. Answers were obtained using the Edinburg postnatal depression scale to measure antepartum depression and a semi-structured standard questionnaire by WHO to measure intimate partner violence. Data was coded and entered into MS Excel and later exported to SPSS for analysis. Report was done in tables, charts and narratives.

Results

The prevalence of antepartum depression was 55.0% at EPDS score of not less than 13 with the prevalence of IPV 12 months prior to current pregnancy and in current pregnancy of 93% and 94% respectively. Chi-square test of association was used to analyse the various associations between variables. There was significant association between antepartum depression and the following: participant's education level ($p=0.011$); partner's education level ($p=0.019$); psychological and physical violence $p= 0.014$ and $p= <0.001$ respectively. There was no statistical significance between antepartum depression and other variables assessed.

Participants with tertiary education had least likelihood of depressive symptoms, 84% less likely than those with no formal education ($OR = 0.16$, $p = 0.033$). Education of girls as well as their spouses is proven to be protective for antepartum depression in child marriage.

Child-mothers who have experienced a psychological violence from their partners where 72% more likely, than those who did not have such experience, to exhibit

depressive symptoms (OR = 1.72, p = 0.015). Also, child-mothers who had experienced a physical violence from their partners had two and half more chances of showing depressive symptoms (OR=2.49, p= < 0.001) compared to those who were not physically abused.

Conclusion and recommendation

Child marriage is an infringement on the right of a child. The prevalence of depression and IPV was 55% and 94% respectively in this study. The risk factors for depression in pregnant girls found in this study are educational status of the girls and their partners, psychological and physical violence. Education of girl-child, governmental and non-governmental involvement is necessary to fight child marriage.Pregnant teenagers should be screened for IPV as well as depression during their antenatal visits and be treated early.

Keywords: Child marriage, Antepartum depression, Intimate partner violence

Social Media Influence on the Sexual Behaviours of Undergraduate Students of the University of Buea, Cameroon

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Background: Global use of social media and internet among youths has increased over the years.The influence of social media on social behaviour is a call for concern in Cameroon as little has been done on this phenomenon. Therefore, this study examined the influence of social media on sexual behaviour of youths in the University of Buea, Cameroon

Methodology: A descriptive cross-sectional study was conducted among 404 undergraduate students in the University of Buea, Cameroon. A multistage random sampling was used to select the respondents. A self-administered semi-structured questionnaire was used obtain information on frequency of use and activities on social media. It also captured the usage and peer influence on social media in relation to the four measures of sexual behaviours; condom use, contraceptive use, multiple sexual partners and early sexual initiation. Data were analysed using descriptive statistics, chi square test and multiple logistic regression. All analyses were conducted at 5% level of significance.

Results: The mean age of the respondents was 21.01years ± 2.28 and 234(57.9%) females. A total of 392 (97%) used social media and most commonly used networking site was WhatsApp (92.8%). The sexual behaviours of interest engaged in after exposure to social media was condom use (115 {28.5%}), use of other contraceptive methods (88{21.8}), early sexual initiation 32(7.9%) and multiple sexual partner practice 27(6.7%). A total of 311(77%) participants used social media daily while 204 (50.5%) used it more than three times daily. Use of other contraceptive methods increased with increase in age (χ^2=10.099, p=0.001). A higher proportion of the males 15(8.8%)

reported having multiple sexual partners as compared to 12(5.1%) female participants (χ^2=2.156, p=0.142). Respondents who accessed social media 2 to 3 times daily were 3 times more likely to start using condoms after exposure to it as compared to those who accessed social media once daily (aOR: 2.57, CI: 1.05-6.28). Males were 2.33times less likely to use condoms after exposure to social media as compared females (CI=0.27-0.68, aOR=0.43). Students at higher levels (levels 300 and above) were 2 times more likely to use contraception after exposure to social media than students 100 level. (CI=1.04-3.67, aOR= 1.96)

Conclusion: The frequency of use of social media influenced condom use and contraceptive use. However, social media use was not associated with having multiple sexual partners and early sexual initiation. The Ministry of health in Cameroon should target social media for projects geared towards youths to influence their behaviour change.

Keywords: Social media, Sexual behaviour

Teachers' Perception and Attitude towards School-Based Sexuality Education in Ibadan North Local Government Area, Oyo State, Nigeria

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Background: About 30 percent of Nigeria's population who are between the ages of 10 – 24 years have been found to be prone to risky behaviours such as unprotected sex, drug abuse and unsafe abortion. Hence, the need for quality school-based sexuality education. However, despite the introduction of the Family Life and Health Education (FLHE) Programme in secondary schools since 2003, studies have found that Nigeria has one of the highest adolescent birth rates in the world with teenage girls between 15-19 years having 109 births per 1,000 women within the same age group and the percentage of young women and young men who have comprehensive knowledge about HIV/AIDS is still abysmally low at 24% and 34% respectively.

Objective: This study assessed the perception, attitude and preparedness of public and private secondary school teachers who are the major stakeholder of Nigeria's FLHE school-based sexuality education programme in secondary schools.

Methodology: A descriptive cross-sectional design using stratified random sampling method was employed in this study to select participating schools. A total of 373 secondary school teachers from twenty schools (twelve private and eight public schools) in Ibadan North Local Government Area participated in this study by completing a self-administered, closed-ended questionnaire. The data was analysed using descriptive and inferential statistics. Ethical clearance was obtained by the Oyo State Ministry of Education and the University of Ibadan/University College Hospital Ethical Review Board.

Results: More than half, 54% of the teachers indicated that sexuality education is best

taught by parents and 55% of them believed the home is the best place to teach on human sexuality. Only 35.4% of the 373 respondents suggested that sexuality education should be introduced to primary school students (usually less than 10 years). Also, 69.7% of the respondents reported to have no formal training on sexuality education and almost one out of every four (23%) had difficulties in teaching about Sexual Coercion and Abuse. This study found that gender and previous training on sexuality education were statistically significant factors that were associated with their perception. Furthermore, the female gender was a statistically significant factor that was associated with a better attitude of teachers towards sexuality education (p=0.019), while a higher educational degree (p=0.010)and type of school (p=0.064) were associated with better comfort level to teach sexuality education topics. Teachers also identified challenges that affect the delivery of sexuality education such as inadequate training, inadequate teaching materials, inadequate support from school and parents.

Conclusion: Overall, findings from this study provides evidence that teachers have a poor perception of their roles, a somewhat good comfort level and a better attitude towards the FLHE school-based sexuality education programme but they need training on how to effectively teach sexuality education to young people. This study re-emphasizes that pre- and in-service training programmes for teachers' is needed to develop their competence, confidence, and commitment to the teaching on human sexuality.

Keywords: Sexuality Education, Teachers, Perception, Family Life and Health education, Attitude, Sexual and Reproductive Health, Secondary Schools, Ibadan

Risky Sexual Behaviour and Associated Factors among Sexually Active Unmarried Young Female Internal Migrants Working in Burayu Town, Ethiopia

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Background: Despite the fact that Ethiopia is one of the least urbanized nations in the world, there is rapidly increasing urbanization recently. Internal migration, mainly rural to urban migration, is becoming one of the main vehicles for the rapid increase. Young female internal migrants are highly vulnerable to risky sexual behaviours (RSB) through several ways which may results in serious health problems such as unintended pregnancy, abortion and sexually transmitted infections (STIs) including HIV. Risky sexual behaviours include younger age at first sexual intercourse (before 18), having multiple sexual partners, sex without condom or inconsistent use of condom and sexual intercourse under influence of substance use. So, this study aimed to assess the factors associated with the risky sexual behaviour among sexually active unmarried young female internal migrants in Burayu Town, Ethiopia.

Methodology: A cross-sectional study design using a mixed method approach was applied for the study. For the quantitative survey, a simple random sampling method was

used to select 267 respondents. A semi-structured interviewer administered questionnaire was used to obtain the information on sexual behaviour of the respondents. The qualitative survey was composed of four focus groups discussion (FGD) with 8 participants in each group. The collected data were cleaned and entered into Epi data version 3.1 and then exported to SPSS Ver.21 for analysis. Logistic regression models were used to indicate the association between explanatory variables (socio-demographic, economic condition, cognitive, psychological and behavioural variables) and the outcome variable which was risky sexual behaviour.

Results: About 35% of the young female internal migrants had sexual debut before age of 18 years; 64.4% had sex without condom or inconsistently used condom; nearly one quarter of the participant had multiple sexual partners and 29.6% had sex under influence of substance uses. The magnitude of RSB among study participants were (79.1%). Sexting [AOR 3.47(95%; CI;1.10-11.94)], frequent indulgence of social media [AOR 10.9(95%;CI;2.3151.89)], feeling of embarrassment to buy condom [AOR 8.28(95%; CI; 2.10-32.62)], unfavourable attitude toward using condom for steady and loving relationship [AOR 5.72(95%; CI; 1.47-22.24)] were related with RSB while perceived self-efficacy [AOR 0.15(95%: CI; 0.04-0.57)] to use condom and perceived risks of getting pregnant [AOR 0.05(95%; CI; 0.010.23)] were found to be protective Internal migrants are one of the most vulnerable groups for poor sexual and reproductive health. factors. The FGDs also further revealed that poverty, social media indulgence, rape, substance use, poor knowledge of condom, unfavourable attitude toward condom use and misconceptions about emergency contraceptive pills were responsible for RSB.

Conclusions: The study found high levels of RSB among sexually-active unmarried young female internal migrants. This finding suggests an urgent need of intervention to promote safe sex among this group. Special attention and prompt interventions are needed to promote the use of condom. The study suggests that more intense efforts should be made to improve awareness about the seriousness of exposure to sexting, cyber bullying and judicious use of social media among unmarried female internal migrants.

Keywords: Internal migration, Young female, Sexually-active, Risky sexual behaviour, Burayu Town, Ethiopia

Prevalence and Factors Associated with Intimate Partner Violence among Pregnant Women and their Partners in Rural Gambia

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Background: An intimate partner is "a person with whom one has a close personal relationship that may be characterized by the partners' emotional connectedness, regular contact, ongoing physical contact and sexual behaviour, identity as a couple, and

familiarity and knowledge about each other's lives. It includes; current or former spouses (married spouses, common-law spouses, civil union spouses, domestic partners), boyfriends/girlfriends, dating partners, ongoing sexual partners" (CDC, 2017). Intimate partner violence can be defined as physical, sexual, psychological or economic harm by a current or former spouse (CDC, 2017) Intimate partner violence is a serious social and public health issue.

According to the World Health Organization (WHO), 1 in 3 (35%) of women worldwide have experienced violence from an intimate partner (WHO, 2013). In the Gambia, the demographic and health survey (DHS) reported 20% prevalence of IPV among ever married women from their partners.

Objectives: The aim of the study is to determine the prevalence and factors associated with IPV among pregnant women and their partners in rural Gambia.

Methods: Mixed methods which involves qualitative and quantitative studies was used in this study. For quantitative component cross-sectional study design was used. For qualitative component an in-depth (IDVs) was applied. This study was conducted in the Central river region (CRR), one of 7 administrative regions of The Gambia. It has a population of 126,910 people (National Census, 2013). In the communities that are the outreach (Maternal and child health) sites of 6 health facilities in CRR

Results: The study enrolled 373 pregnant women. More than 65% of the respondents of the respondents had no formal education with 97% being married and predominantly muslin (more than 98%). Eighty-seven percent of the respondents are house wives (unemployed) with an average of 75% of the respondents having good knowledge on the various forms of intimate partner violence. It was found that the prevalence of intimate partner violence among respondents was 67% with psychological violence being the most common being experienced by 43% of the respondents. Fifty six percent of the respondents had experienced abuse as a child. However, 87% of the respondents had a negative attitude towards intimate partner violence. Results from the logistic regression showed that women who had a positive attitude had a four times likelihood of experiencing violence. Women with good knowledge of intimate partner violence were 53% more likely to experience violence from an intimate partner.

Conclusions: The prevalence of intimate partner violence among pregnant women in rural Gambia is high. Psychological violence is the most common form of violence among respondents. The factors found to be associated with intimate partner violence is older age, women who have violent partners and having witnessed their parents quarrel. The perception of the male partners is that violence is as a result of misunderstandings among couples, influence from bad friends and work of evil people. Sensitization as well as enforcement of policies is required to mitigate violence among intimate partners

Keywords: Intimate partner, Violence, Intimate partner violence, Pregnancy, The Gambia, Risk factors

Factors Influencing Male Involvement in Family Planning in Nakawa Division, Kampala, Uganda

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Background: Male partners in Africa have a significant influence on their partner's health and access to health care. Men in African countries are often the primary decision-makers. Regardless of this, men may not make well informed decisions about family planning. This study aimed to assess the factors influencing male involvement in Family Planning in Nakawa Division, Kampala, Uganda.

Methods: This was a community based cross-sectional study using mixed methods. Participants were selected according to households through multi-stage sampling. A total of 480 households were selected from twenty-three parishes in the division. Pearson's Chi-square test, and binary logistic regression analyses were conducted and statistically significant tests declared at P-value ⩽0.05.

Results: The level of male partner involvement in FP was low, 178(37%). This was supported by the participants in the FGDs and KIIs, 285(52.5%) participants discussed FP & CU with their partners and 352(66.5%) reported that their partners offered them financial support for FP services. Of those 465 (96.8%) that had used an FP method in the last 12 months prior to the study, only 106(22.8%) reported that their male partners had accompanied them to the FP clinic at least once in the last 12 months. Significant predictors (P-value⩽ 0.05) of male involvement in FP were participants' level of education being primary (P-value=0.049) and tertiary (P-value=0.023, OR=2.107, 95% CI {1.108-4.005}), and the Partners level of education being primary (P-value=0.014), Secondary education (P-value=0.011, OR=13.846, 95% CI {11.827-104.948}) and tertiary education (P-value=0.005, OR=17.504, 95% CI {2.328-131.610}), overall good community perception of male involvement in FP (P-value=0.046, OR=1.720, 95% CI {1.011-2.927}) and the FP clinic environment being welcoming to men (P-value=0.001, OR=4.137, 95% CI {1.817-9.416}).

Conclusions: The factors influencing male involvement in FP were socio-demographic factors (education level of male partner and education level of respondent), overall community perceptions of male involvement in FP and health facility related factors (the FP clinic being welcoming for men). The level of male partner involvement in FP was low at 37% and this was in agreement with other researchers. However, provision of better services and increased sensitization of the masses should be enhanced as a means of attaining the broader objective of increasing male partner involvement in FP for better contraceptive use and better birth spacing.

Key words: Male Involvement, Male Participation, Family planning, Contraceptive use, Share Decision Making

Factors Influencing Obstetric Home Delivery and Outcome among Women of Reproductive Age in Dusmareb District, Somalia

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Background: Homebirth (home delivery) is a birth that takes place in a residence rather than in a hospital or a birth center. In Somalia, only one out of six pregnant women receive appropriate care. Also the Federal government of Somalia reported that 53% of women in reproductive age deliver in their homes. Apart from the reports of the Somali Federal Government, WHO and UNICEF, no study that has assessed the factors determining home delivery and its outcome in Somalia is reported in the literature.
Aims: The aim of the study is to determine factors influencing obstetric home delivery and the outcomes among women of reproductive age in Dusmareb district, Somalia.
Methods: The study was used a descriptive cross-sectional study in Dusamreb district of Somalia with both qualitative and quantitative techniques of data collections and random technique was used to select 228 women of reproductive age. Well-structured questionnaires were administered by the interviewer to participants who gave their consent and also two focus group discussion sessions were conducted with discussion guides. Data were analysed using the Statistical Package for Social Sciences version 20.0. Descriptive statistics such as means, standard deviation, proportions, and range were used to summarize the data. Inferential statistics such as Chi-square and logistic regression analysis were used to test association, with the level of significance set at 5%.
Results: The findings of this study show that 41% have had at least one child delivery at home. The mean age of the respondents was 32.9 ± 8.1 years; 15(6.6%) had tertiary education and Women with 4 – 6 children were four times more likely to have a home delivery (OR = 3.65, p = 0.002), those with 7 – 9 children were almost two and half times more likely to have a home delivery (OR = 2.38, p = 0.056) compared with women with 7 – 9 children. Women with employment were 59% less likely to have a home delivery (OR = 0.41 compared with those not employed, p = 0.009); women whose husbands decided their place of delivery for them were 58% less likely to deliver their child at home (OR = 0.42, p = 0.038); women who had their mothers decide for them were ten times more likely to deliver their babies at home (OR = 10.02, p < 0.001). The study also found as outcome of home delivery that 22% of the women reported their baby was not okay and have taken to hospital, while 41(73.2%) reported the child died within 28 days following delivery while 24 (42.8%), women experienced prolonged labour during their last delivery at home. In the focus group discussion the women reported that there is poor communication relationship between the mothers and health staff, also the women reported that they were going to home delivery due to fear of C- section and episiotomy.
Conclusions: The study is highly recommended the government to create employment for the women, and increase the gender balance for the jobs as the study showed that employment status of the women were influencing their choice to deliver their babies at home and while hospital directors were recommended to monitor the relationship between the care giver and the pregnant mother.

Keywords: Home delivery, Maternal health, Dhusamareeb, Somalia